**BOB LeVITUS**

Dr. Macintosh®

Tips, Techniques, and Advice on Mastering the Macintosh

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For Lisa and Allison

Acknowledgments

Sincere thanks are due to everyone who assisted with this book in any way. First, and foremost, I want to thank my wife, Lisa, who tirelessly proofread, called manufacturers, took care of our daughter, cooked meals, and rubbed my shoulders. Without her this book could never have been finished.

My technical editors, Laurie Miller and C.J. Weigand, and the entire staff at Addison-Wesley—Carole, Rachel, Abby, Perry, Diane, and everyone else—deserve more than thanks. Their input was invaluable; their support endless.

Thanks to Ed Tittel, Steve Phillips, and CompuServe, Inc., for their contributions to Chapters 4, 5, and 8 respectively. I'd also like to thank Wayne Matthews at M & L Typesetting for his professionalism and speed in typesetting this manuscript, and the tips about using service bureaus in Chapter 7.

Thanks also to super-agent Bill Gladstone, for coming up with the concept for this book.

Last, but not least, I want to thank each of the power users who contributed to Chapter 9.

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Introduction

*Power User (pou'er yoo'zer) n. **1.** Someone who uses a Macintosh better, faster, or more elegantly than you do. **2.** Someone who can answer Macintosh-related questions you can't.
(Taken from The Dr. Macintosh Dictionary at the end of this book.)*

What Will This Book Do for You?

This book is about learning to use your Mac better.

Being a power user means finding faster, easier, and better ways of doing things. And knowing what to do in an emergency. To become a power user, you need absolutely no knowledge of programming. In fact, many power users, myself included, don't know how to program. Being a power user is about *using* your Mac, not programming it! I guarantee that, after reading this book, you'll be more productive every time you sit down in front of your Mac.

I've been doing this for a long time. I can't tell you how many times I've done something the same way for months, only to have someone show me a better way—one that takes less time or effort. This book will save you from having to reinvent the wheel.

1

How I Learned What I Know

I live and breathe Macintosh. For almost three years I served as editor-in-chief of *MACazine*, one of the first, and always the most outspoken, of the Macintosh publications. Known as "The Village Voice" of Macintosh computer magazines, *MACazine* had a hard-hitting, no-holds-barred policy that made us popular with our readers. We weren't afraid to tell them about the bugs, but were just as likely to gush enthusiastically about a product that worked well. Unfortunately, *MACazine* recently ceased publication, a victim of the economics of being a small independent in a market-place dominated by efficient mega-corporations.

You might say my job for the past three years has been to find information that would help our readers get more from their Macs. I had the tremendous opportunity to examine more software in a month than most people will use in a lifetime.

Needless to say, I've spent a good part of the past few years hunched over in front of one of my two Macs from dawn to dusk, and often long into the night. If I'm not testing new software or hardware, I'm writing or preparing camera ready copy. Or using my modem to gather information and keep in touch with friends and business acquaintances. Because I use my Mac for almost everything—writing, schedules, graphics, communications, household finance, and more—I like nothing better than discovering a method of doing something better, faster, or more elegantly. And, in the true Macintosh spirit, I love being able to share it with other Macintosh users.

That's what *MACazine* was about. It was published using only the latest Macintosh technology. Not only was all of the writing, editing, page-layout, and typesetting done on Macs, but we used Macs for phone messages, electronic mail, telecommunications, budgets, editing, photo retouching, and color separations. We were an almost-paperless office—really pushing the limit of what we could accomplish using the latest state-of-the-art technology. Every employee had at least a Mac Plus and 20Mb hard disk drive at their work station. Because the Macintosh is so easy to use, and because training employees to use it is easy, we had no trouble convincing everyone to use the Mac instead of photocopying memos or hand-writing message slips. Every day was an adventure.

I spent a lot of time trying to discover the best or most convenient way of doing something, either for a staff member or for an upcoming article. It was my job to know what was going on in the Macintosh community—what was hot and what was not. So I read everything out there. And I mean *everything*. At that time (and today), I read every issue of *Macworld, MacUser, MacWeek, MacTutor, Nibble Mac, InfoWorld, Personal Computing, MacGuide,* and *Macintosh Buyer's Guide* from cover to cover. Then I read about fifty user group newsletters. (Some of the best information, hints, and tips appear in user group newsletters. User group members join because they want answers. Many of them are already power users.)

In addition, as if all that reading doesn't keep me busy enough, I'm a modem rat too. I prowl CompuServe and MacNet's Macintosh boards most nights, and drop in on AppleLink, GEnie, and MCI frequently.

This book contains the best of what I've picked up over the past four years through my experiences as a Macintosh lover, beta-tester, editor, modem rat, advice counselor, consultant, author, and general all-around Macaholic.

How the Book Is Organized

The chapters in this book are organized logically by topic. Each includes a brief introduction followed by a discussion. Most include tutorials, specific hints or both. Each chapter ends with a summary and recommendations: my insights and purchase suggestions.

The book is made up of the following chapters:

Chapter 1: The Basics This chapter covers the basics of using the Mac. You'll also find System and Finder tips, hints on using and installing fonts, information about using desk accessories and function keys, and general time-saving hints.

Chapter 2: File and Disk Recovery In addition to providing complete instructions for creating your own "Disaster Disk," this chapter tells you what to do:

- when your hard disk doesn't boot
- when nothing happens when you turn on your Mac
- if you're asked if you want to initialize your hard disk (say "no")
- if you have an INIT conflict
- about SCSI terminators

and much more.

Chapter 3: Understanding Hard Disks In this chapter, you'll find out what a hard disk is, what it does, how it works, and why you want one. You'll learn how to go about selecting the right hard disk for you and how to organize it once you've got it. The chapter also provides hints and tips for setting up your hard disk and keeping it running smoothly.

Chapter 4: Protecting Your Work This chapter includes the hows and whys of disk backup, some strategies for avoiding disaster, and tips on the best software and hardware for your needs.

Chapter 5: Hardware Upgrades This chapter provides everything you'll need to know about the three most effective hardware upgrades for enhancing productivity: RAM upgrades, accelerators and large screen monitors. You'll also be given a logical strategy for justifying the expense of these upgrades.

Chapter 6: Utility Software This chapter includes a complete discussion of the meat and potatoes of the power user: utility software—software that owes its usefulness to the computer. A utility would be meaningless without a computer to run it on. Word processors and spreadsheets are not utilities; disk backup programs, macro recorders, and screen savers are. The essential "must-buy" utilities are examined, as are a number of productivity enhancing add-ons that are highly recommended if you have the budget for them.

Chapter 7: Printing In this chapter, you'll learn how to get the best results no matter which printer you're using. The text includes specific hints for using ImageWriters, LaserWriters, and Linotronic typesetters, as well as a discussion of PostScript versus non-PostScript printers.

Chapter 8: Telecommunication In this chapter you'll find out why a modem is like a magic carpet. This chapter gives advice on selecting the proper hardware and software for your needs. Descriptions of many places your modem can take you are also provided.

Chapter 9: What Other Power Users Think You Should Know This chapter offers an incredible collection of tips and hints from other power users all across the country. These tips have been gathered via CompuServe, MacNet, and GEnie.

Information about the products mentioned in each chapter appears in the recommendations section found at the end of each chapter.

The book concludes with The Dr. Macintosh Dictionary, which explains in plain English many commonly used computer terms (RAM, ROM, INIT, AppleTalk, crash, and so forth). A comprehensive index is also provided.

How To Use the Book

The best way to use this book would be to read it from cover to cover. Skim over the things you already know, but read every chapter. There are a lot of good hints and tips scattered throughout. If you read only part of the book, you run the risk of missing something that could save you time or trouble someday.

If you come across a term you don't understand, check The Dr. Macintosh Dictionary, which appears at the end of the book. If you're looking for information about a specific topic, try either the dictionary or the index. I've tried to make both the index and the dictionary as comprehensive as possible.

I'd appreciate your comments. If you don't have a modem, I can be reached in care of my publisher, Addison-Wesley Publishing Company in Reading, Massachusetts. For those of you with modems, my electronic addresses are:

CompuServe 73537,1217
GEnie: R.LEVITUS
MacNet: LeVitus
MCI: 306-0735

I'm particularly interested in suggestions for how I could make the next edition of this book more helpful to you. Of course, if you've got any hints or tips of your own, I'd love to know about them.

This book has been a pleasure to write. I hope you enjoy reading it as much as I enjoyed writing it.

1

The Basics

A few things you should know about the
System, Finder, desk accessories, fonts,
FKEYs, and the Macintosh in general.

*Long, long ago, when I bought my first Mac, I thought it would only
take me a few days to master. After all, the manuals were short and the
interface intuitive. And, within a few days, I had indeed reached a level
of proficiency. I could double-click, save, and use the trash. I knew what
start-up and data disks were. I knew the difference between an applica-
tion and a document. I knew about Font/DA Mover. That, I thought,
was all I needed.*

*Over the next few months I came to realize that there are hun-
dreds of ways you can customize your Mac to control the way it does*

things. And there are thousands of shortcuts, both documented and undocumented, waiting to be discovered. Not to mention all of the things you can try when things aren't working just right.

Around the same time, I became Editor-in-Chief of MACazine. *So for the past three years, my job has been discovering and sharing information that helps Macintosh owners use their machines better, faster and more elegantly. I'm not ashamed to admit that I'm still learning, because it's true, but I must say I've learned an awful lot in these past three years.*

The Macintosh is an extremely powerful tool, contained in a deceptively easy-to-use wrapper. Even someone who knows almost nothing about it can be productive on a Mac. But a power user, one who knows tips and shortcuts and a bit about what to do in an emergency, may be twice as productive.

That's what it's all about. Doing more in less time, finding easier ways of doing things, and knowing how to respond in an emergency.

This chapter covers basic tips and hints for improving performance of the Finder, MultiFinder, and System software. The reason this material appears in the first chapter should be obvious: although every reader may not need or want a hard disk or high-powered software, anyone who uses a Mac must use the Finder and other System software. The hints and techniques in this chapter should help each of you coax more performance out of your Mac.

Before you start reading this chapter, you should be familiar with the Apple Owner's Guide *that came with your Mac, as well as the documentation that comes with Apple System Software Releases. These two documents go a long way toward explaining the mysteries of System software, so if you only glanced at them when you got your computer, you might give them another look.*

System Software (System and Finder)

The System and Finder are the programs that contain the instructions that make your Mac work. They are always stored in a special folder called the System Folder, and are designated *System software* to differentiate them from application software, such as MacWrite and MacPaint.

In order for your Mac to boot, at least one disk with the System and Finder must be available when you turn on the Mac.

This is called a start-up disk. Once you turn your Mac on, the contents of the System and Finder are loaded into RAM.

The System file contains some of the instructions your Mac needs to run, plus information that adds to or modifies the remainder of the operating instructions, which are stored in ROM. It also contains keyboard layouts and character sets for English or whatever other language you intend to use on your Mac, and holds your fonts and desk accessories.

The Finder contains the information that draws and manages the Macintosh desktop. It is also in charge of handling such functions as windows, disk copying, file management, and menus.

Because these two programs are always running, the first thing you need to know is that there is a greater chance of their becoming damaged than there is for most programs. So you should learn to replace your System and Finder at the first sign of trouble. Even when things are running fine, I replace the System and Finder on my hard disk every couple of months, just in case.

Here are a few times you should suspect faulty System software and replace your System and Finder with fresh ones from a locked master disk:

- When a start-up disk that used to work stops working
- If a desk accessory repeatedly malfunctions
- When you begin experiencing system crashes for no apparent reason
- If dialog or alert boxes appear garbled
- When other unexplained weirdness occurs

There is a more detailed discussion of replacing damaged System software in Chapter 2. For now, just remember that because these files are always in use, they stand a greater chance of becoming damaged than application software, and they should be the first thing you suspect if things start acting funny.

Apple System Software Updates

Apple issues new System software periodically. Apple System software updates are multidisk sets that include the latest System, Finder, printer drivers, etc. Each update fixes bugs and adds features to the previous releases. To insure that your Mac always operates at peak performance, always use the latest System software (unless you're a Mac 512 or 512Ke owner, in which case you should be using the latest version for those machines, Version 4.1).

To find out what version you're currently using, select "About the Finder" from under the Apple menu. The latest version of the System software as this book goes to press is 6.0.3. Figure 1–1 shows the "About the Finder" box on my Mac II, with 5 megabytes of RAM and with MultiFinder turned on. You'll notice that in addition to System and Finder version, this box also provides information about memory (RAM) usage. At the moment, I'm using 512K to run Word, 160K to run the Finder, and 2,498K for the System, which leaves 1,950K available.

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┌─────────────────────────────────────────────────────────────┐
│ ▣□▭▭▭▭▭  About the Macintosh™ Finder  ▭▭▭▭▭ │
├─────────────────────────────────────────────────────────────┤
│  Finder:  6.1              Larry, John, Steve, and Bruce     │
│  System:  6.0.3            ⊕Apple Computer, Inc. 1983-88      │
│                                                              │
│  Total Memory:    5,120K   Largest Unused Block:  1,950K     │
│  ◈ Word              512K  ▓▓▓▓▒                             │
│  ▤ Finder            160K  ▓                                 │
│  ▤ System          2,498K  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▒▒▒               │
└─────────────────────────────────────────────────────────────┘
```
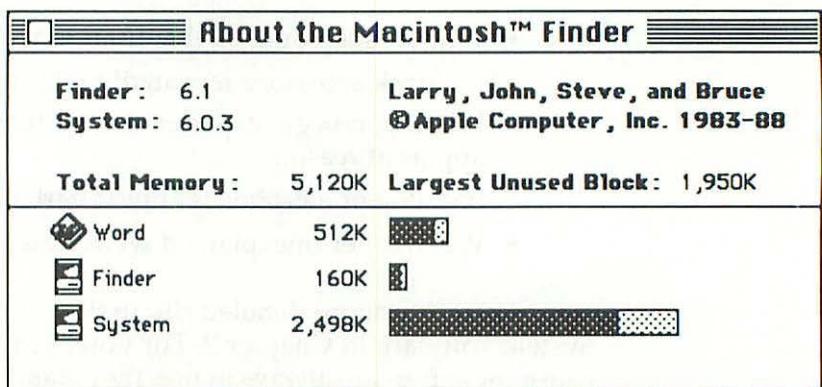
Figure 1–1
About the Finder
on the Mac II

There are two things you should remember when you update your System software:

1. Copy and save your old System software before you
   update. The safest thing to do is copy your entire
   System folder to floppy disks before using the Installer.
   (See the second point below.) That way, if something
   doesn't work properly with the new System releases,
   you can easily change things back to the way they were
   by deleting the new System folder and replacing it with
   the old.

   Do not store the copies of the System or Finder on
   your hard disk. You should never have more than one
   System and Finder on a disk. Never. The reason for this
   is simple. The Mac expects to find only one System
   Folder, containing exactly one System and Finder, on
   any disk or volume. When more than one exist, the
   Mac gets confused and acts unpredictably. Crashes and
   System errors will occur. If you suspect you have
   inadvertently gotten a second System or Finder on
   your hard disk, use the Find File desk accessory (DA)
   to search for "System" and "Finder." If it finds more
   than one, reboot with a start-up disk in your floppy
   drive and delete the extras on your hard disk.

   When a program or desk accessory doesn't work
   with a new version of System software, the publisher of
   the program or desk accessory will usually release an
   update. If you're having problems with any piece of
   hardware or software after installing new System
   software, contact its manufacturer to describe the prob-
   lem, then go back to using the older System software
   until the hardware or software has been updated by
   the manufacturer.

2. Always use the Installer. Doing so insures that you'll
   be updating only the things your specific system needs.

   The Installer is provided with Apple System soft-
   ware updates. It's an application that automatically
   copies everything you need to upgrade from the
   master disk to whatever disk you choose. To be safe,
   you should always use the Installer to update System
   software—never just drag the files from the master

disk to the disk you want updated. Just follow the directions in the "Read Me" file and you'll be fine.

If you suspect any corruption or damage to your present System and Finder, delete them before running the Installer—this will put a brand new System and Finder on the disk you select instead of updating your old ones. Before you delete them, make sure you have copies of any fonts or DAs you installed in the System.

There are three ways to obtain the latest System software:

- From an Apple dealer

    Apple dealers usually have the latest version of the System software; it sells for around $50. Dealers are not *required* by Apple to make you purchase the complete package of disks and manuals—they are *permitted* to let you to copy the software (but not the documentation) to your own disks. Some dealers will not allow you to do this, however; they may insist that you purchase the package.

- From a user group

    If you're a member of a user group, you'll usually be able to pick up copies of the latest System software for no more than the cost of the disks. This method will get you only the software, and perhaps some on-disk release notes. If you want complete printed documentation, you must purchase the full update from an authorized Apple dealer.

- From an on-line information service (CompuServe, MacNet, or GEnie)

    If you elect to get your System software updates via modem, your only cost will be the cost of the connection time for the download. Again, you will get only the software, and perhaps some release notes.

If you've never upgraded your System software, I suggest you purchase the upgrade and documentation from a dealer and follow the instructions. It's easy.

If you've updated your System software before, you may not need the documentation. You'll save yourself a few bucks if you get the update without printed documentation from a friendly dealer, user group, or on-line service.

Hints and Tips in the Finder

The Finder, sometimes referred to as the *desktop*, is the backbone of the Macintosh. You use it to manage disks, files, and folders. Because you'll spend a good part of each Macintosh session in the Finder, you'll want to learn how to do things as quickly as possible. Here are a few of my favorite quick tips.

Canceling a Double-Click

If you accidentally double-click a document or application that you didn't mean to launch, you can often abort the launch by holding down the Command key and typing a period (.). You'll have to be quick about it, though. If you wait too long after the double-click, it won't work.

Many applications also support this method (often called *Command-period*) for aborting an action. Command-period, for example, will cancel printing in most applications.

Fast-Erase for Floppies

If you want to erase a floppy disk quickly, hold down the Option, Command, and Tab keys when you insert it. A dialog box will appear, warning you that you are about to destroy all the information on the disk. This method is faster than inserting a disk, waiting for it to come up, then selecting Erase Disk from the Special menu in the Finder.

Moving Quickly up the Hierarchy in Standard GetFile Dialog Boxes

If you want to move up through folders, simply click on the volume name in any GetFile or PutFile dialog box. (GetFile and Put-File are the official names of the dialog boxes you see when you Open or Save a file. See Figure 1–2.) This will move you up one level of folders. Figure 1–2 shows a standard PutFile dialog box and the volume (i.e. disk) name circled. (Cruella is the name I've given my internal hard disk). If you click where indicated, you'll move up one level in the hierarchy of folders. This is a fast way to navigate upward through nested folders.

Figure 1–2
Standard PutFile
Dialog Box with
Volume Name
Highlighted

Printing Groups of Files

To print a group of documents from the Finder, make sure the proper printer has been selected in the Chooser. Then drag the selection rectangle around the icons of the documents you want to print and select Print from the File menu. If you want them to print in a specific order, click on the icon of the first file you want to print, then hold down the Shift key and click the rest of the files you want printed in the order in which you want them to print.

This shortcut works only on documents of the same type. In other words, you can't select a few MacWrite and a few MacPaint documents. They must all be created by the same application.

Closing Multiple Windows

If you want to close all open windows in the Finder, simply click the close box of any window while holding down the Option key. Another way to close all windows is to hold down the Option key when you quit any application. This will return you to the Finder with all windows closed.
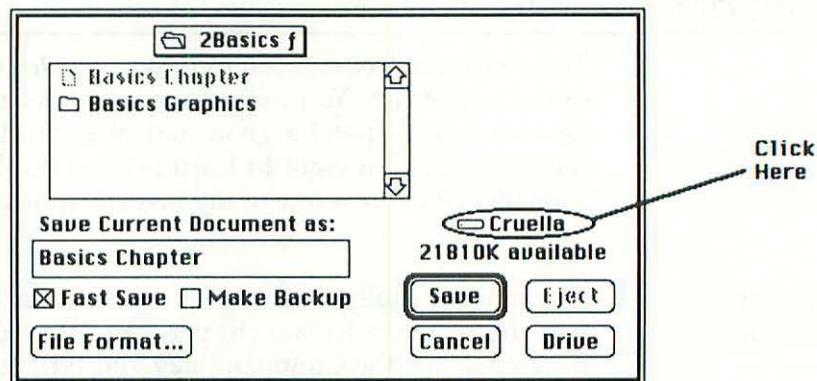
Temporarily
Opening
Windows

If you hold down the Option key when you open a folder in the Finder, the window will open temporarily—until you quit the application or close the document. When you launch an application and then return to the Finder, the window will be closed again. This does not work with MultiFinder.

Desk Accessories

One of the easiest ways to coax more performance out of your Mac is to enhance your System software by adding productivity tools called *desk accessories*. There are hundreds of desk accessories available both commercially and as public domain/shareware.

Desk accessories (DAs) are programs that are available under the Apple menu no matter what application is currently running. There are DAs available for every occasion: databases, outline processors, text editors, graphics editors, spelling checkers, and more are available in DA form. The biggest advantage of using DAs is that you can access them at any time, even when you're using an application. So you could be typing in your word processor and using a database DA to look up addresses at the same time.

To get you started, Apple provides the following desk accessories on the System Tools disks: Alarm Clock, Calculator, Control Panel, Chooser, Scrapbook, and Find File. Commercial DAs, ones you can buy, include DiskTop (file management), ACTA (outline processor), Coach (spelling checker), DeskPaint (graphics) and HyperDA (HyperCard reader). Desk accessories are seen as files with distinctive icons, commonly known as "suitcases" (Figure 1–3).
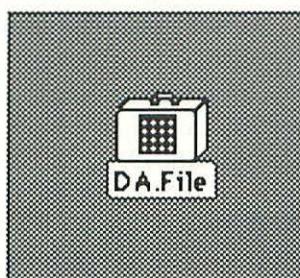
Figure 1–3
A Desk Accessory's
Distinctive Suitcase
Icon.

You use Apple's Font/DA Mover to add or remove DAs or fonts from your System file. The Font/DA Mover program is a part of the Apple System software. Its sole purpose is to install or remove fonts and DAs, which are stored in the System file. In Figure 1–4, I'm about to install (copy) the desk accessory Sun Clock from its suitcase icon on the volume Cruella to the System file on the volume Developer Relations. Clicking the >>Copy>> button will start the copying process.
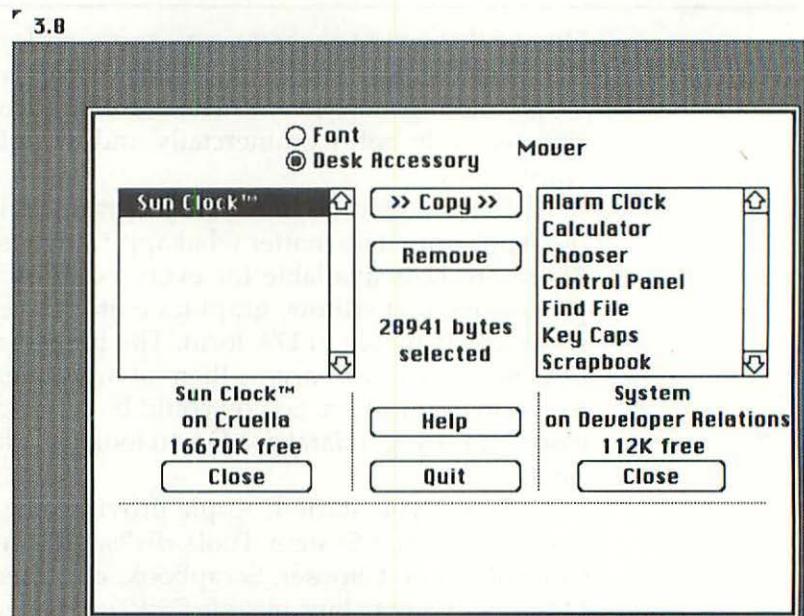
Figure 1–4
Font/DA Mover

But there's a problem—Apple has imposed a limit of 15 DAs. If you try installing a 16th, Font/DA Mover will notify you that you can't install any more desk accessories. (Incidentally, the number of fonts is also limited, but you are allowed a generous 52 fonts, not 15 as is the case for DAs. The font/DA limits will no doubt be addressed by Apple in future System software upgrades.)

Fortunately, there is a way to overcome these limitations— utility programs such as Suitcase II or MasterJuggler allow you to use almost any number of fonts, DAs, FKEYs, and even sounds, without installing them in your System file (see the next section for information about FKEYs, and Chapter 6 for information about Suitcase II and MasterJuggler). The only constraints are disk space

and available RAM. Even on a stock Mac Plus you should easily be able to double or triple the number of desk accessories and fonts you have available. In addition, if you have the disk space, you can store sets of fonts and DAs for occasional use. See Figure 1–5 for an illustration of using more than 15 DAs by installing Master Juggler.

These utility programs also reduce the need to plan ahead— if you need a font, DA, FKEY, or sound, you can access it "on the fly" with Suitcase II or MasterJuggler. Without them, you'd have to quit what you were doing, use Font/DA Mover to install them in your System, then return to what you were doing.

Figure 1–5
Stretching the
15-DA Apple-
imposed Limit with
MasterJuggler

Comment
Control Panel
CuratorDA™
DeskDraw™
DeskPaint™
DiskTop
Find File
GOfer™
Graphics Copier
HyperDA
JoliWrite
KiwiEnvelopes
Laser Queue
LaserStatus
Mac's Headroom
MacPlan™
McSink
miniWRITER
MockChart
MockTerminal
MockWrite
QuickMail
SmartScrap™
Special Clock
Super Ruler

There are a number of other benefits to using one of these utilities instead of installing DAs directly into your System. First, the System is already a fairly large file. Adding fonts and DAs only makes it larger. This is a bigger problem for users without a hard disk; a System filled with fonts and DAs can easily grow larger than 800K. Installing DAs directly into your System also adds complexity to an already complicated System file. The System file is damaged easily enough without cramming it full of fonts, DAs, sounds and FKEYs. If your System does become damaged, it is infinitely easier to replace it if it hasn't been extensively customized.

Suitcase II and MasterJuggler also allow you to open and use fonts, FKEYs and sounds without installing them in your System. A more complete discussion of these utilities appears in Chapter 6.

FKEYs

FKEYs are another kind of program you can add to your System. They are keyboard shortcuts that are accessed by pressing Command-Shift and a number between 0 and 9. Apple provides FKEYs for ejecting floppy disks (Command-Shift-1 or -2), Screen Dump to Disk (Command-Shift-3), and Screen Dump to ImageWriter (Command-Shift-4). These are permanently installed in your System and cannot be changed or deleted easily.

But there are still six number keys left: 5, 6, 7, 8, 9, and 0. These can be used for other FKEYs. Most FKEYs come with their own installer, but they can also be installed using ResEdit or opened using Suitcase II or MasterJuggler.

Among the more useful public domain and shareware FKEYs are DateKey, which types in the current date, and Switch-a-Roo, which allows you to toggle between any two screen settings on a Mac II. There aren't many commercial FKEYs, but hundreds of useful ones are available as public domain software or shareware.

You'll learn a lot more about DA's and FKEYs in Chapter 6. For now, just remember that the System file is easily customized and that there are many DAs and FKEYs that can save you time and effort.

Fonts

Fonts, more accurately known as *screen fonts*, to differentiate them from downloadable PostScript fonts (see Chapter 7 for more information), are the character sets you see on the screen. Monaco, Geneva and Chicago are common examples; Apple provides these with your System software. Like DAs, fonts are installed in your System file using the Font/DA Mover application.

Again, you can avoid the Apple-imposed limit of 52 fonts, and have a choice of whatever font you like at any time (disk space permitting), by using MasterJuggler or Suitcase II.

Many good-looking fonts are available from commercial publishers. Surprisingly, many fine fonts, such as Boston II and Beverly Hills, are available as shareware.

Adding fonts and dressing up your work is just one more way you can customize your Macintosh environment to suit your needs as well as your personality.

Avoiding the Finder

One of the easiest ways to save time is to avoid the Finder. There are many times when you need to use one of the Finder's functions—to create a new folder, trash, move, or duplicate a file, etc. In order to do so, you need to quit the application you're working in and return to the Finder's desktop (unless, of course, you're using MultiFinder).

Another way the Finder can waste your time is when you change from one application to another. Ordinarily, you need to quit the first application, return to the Finder, then launch the second application.

Two of the best ways to avoid the Finder are to use Disk-Top or MultiFinder. DiskTop is probably the most useful desk accessory ever invented, and it's one of the true bargains around. It will save you time every time you use it. Select DiskTop from the Apple menu and you can copy, move, delete, rename, find, get information, switch to another application, restart, create folders, and more. All without quitting the application you're using. I find it indispensable.

MultiFinder lets you do the same things, and it's free. But it requires more than one megabyte of RAM in most cases.

If you have enough RAM to use MultiFinder, by all means do so. It will allow you to have the Finder and other applications running at the same time. If not, check out DiskTop. Whatever you decide to do, remember that those trips to the Finder cost you time.

Interestingly, even though I'm now working at a Mac II with 5Mb of RAM running MultiFinder, I still use DiskTop for most file management. Among its other terrific features, it allows you to perform most actions from the keyboard without having to grab the mouse and click your way through folders. It's convenient because it comes up in its own window, in front of whatever I'm working on. This means I don't have to resize windows to get to folders on the desktop. It also means I don't have to double-click open a bunch of folders to get what I'm looking for.

As you can see in Figure 1–6, the DiskTop window provides just about every file-management function of the Finder with the added convenience of not having to open folders or resize windows. Every function is equally accessible from keyboard or mouse, so no matter how you use your Mac, you'll find DiskTop saves you time and effort.

A more complete discussion of it appears in Chapter 6.

General Hints

The following sections provide a few general hints that will help you in your quest to become a power user.

Read the Manual

There's an old saying that goes, "Power users don't read manuals." Don't believe it. Much of the power of today's Macintosh software is concealed. If you don't read the documentation, you may miss out on powerful features that aren't in the menus.

Read About the Macintosh

You can never stop learning about the Mac. Read everything you have time for. Publications worth investigating include *Macworld*, *MacUser*, *MacWeek*, and *MacGuide*. For programmers, there's *MacTutor*. HyperCard enthusiasts should check out *Macintosh Hands-On* (formerly *NibbleMac*).
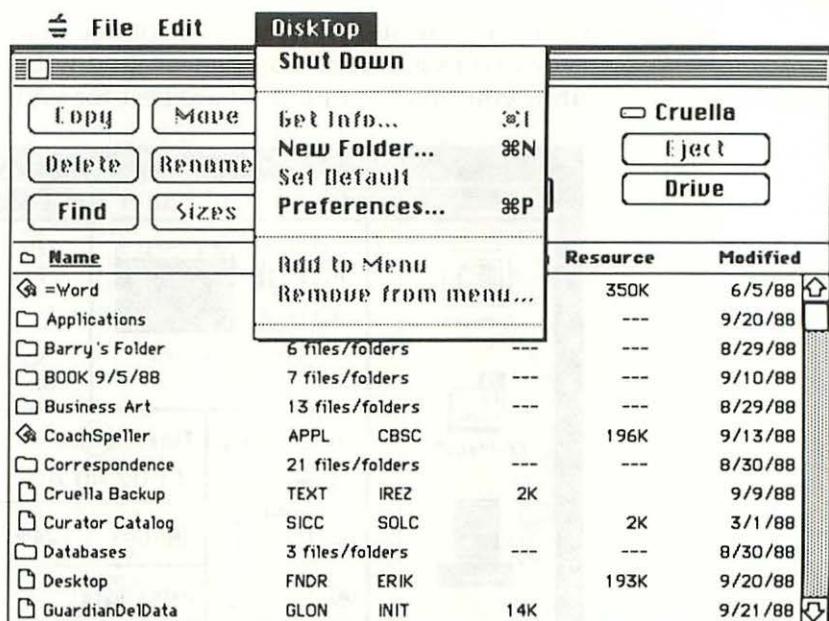
Figure 1-6
DiskTop Does
Everything the
Finder Does and
More

These publications will help you keep up to date on Mac technology. *Macworld* and *MacUser* are particularly good if you're looking for tips, hints, product reviews, and comparisons.

Improve Your Typing Skills

If you're not typing at least 40 words per minute, you're wasting time. Possibly the easiest way to get more done in less time is to become a better typist. There are lots of inexpensive programs that can help—Type! and Typing Tutor IV are two of the best.

Customize Your Working Environment with the Control Panel

Many users forget that many aspects of your Macintosh work environment can be changed with the Control Panel. By selecting the icon called General from the scrolling list at the left of the window, you can change the desktop pattern, rate of insertion point blinking, menu blinking, sound volume, RAM cache setting, and internal clock settings. All of these controls can be seen in Figure 1–7. Clicking the Keyboard or Mouse icons will allow you to adjust the sensitivity of your keyboard or mouse, and clicking the Sound icon will allow you to select a beep sound. The

Control Panel allows you to customize many facets of your everyday work environment. Play around with the different settings until you find the ones that are best for you.
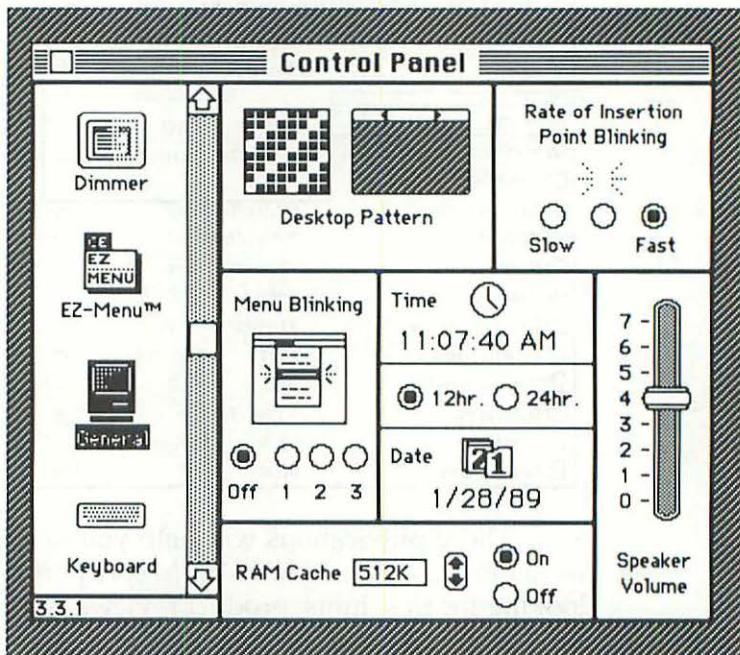
Develop Mouse Independence

Another way to get things done faster is to reduce your dependence on the mouse. Use command-key equivalents instead of reaching for the mouse. For example, when you need to create a new folder in the Finder, get into the habit of using the shortcut Command-N instead of grabbing the mouse, pulling down the File menu, and selecting New Folder.

Almost every Macintosh program has command-key equivalents for some menu choices. Learn them and use them. Once you get into the habit of using them, grabbing the mouse to pull down a menu will seem archaic.

Unfortunately, many programs don't offer command keys for frequently performed actions. The way around this is to purchase a keyboard enhancer or macro program such as QuicKeys or Tempo II (or even the less powerful MacroMaker, which is included with System software releases 6.0.x). With one of these programs you can, with a single keystroke:

- Launch applications or documents
- Open desk accessories
- Create your own command-key equivalents in any program or in the Finder
- Scroll, close, or resize windows
- Type any text you like (boilerplate text)
- Type the time and/or date
- Restart/Shut Down

You'll learn more about keyboard enhancers in Chapter 6.

Don't Be Afraid To Use Technical Support

When you buy software, you're usually entitled to some kind of technical support from the publisher. If you're having trouble getting something done, or if a feature doesn't seem to work properly, you should call for help. But before making the call, check the manual. There's nothing more embarrassing than calling for help and having the voice on the phone tell you the solution is on page 5 of the manual.

Try to be helpful when you call. Know what version of the program you are using and what System version you're running. Try to remember exactly what happened just before the problem occurred and describe it carefully to the support person. Try to duplicate the problem before calling. If it occurs repeatedly, it should be easier to resolve than if it only happens sporadically. Having this information handy when you call for technical support will save both of you time, as well as help the technician solve your problem.

Join a User Group

One of the best ways to learn about the Mac is to join a user group. User groups are made up of people just like you—people who want to learn how to use their Mac more effectively. They hold regular meetings, demonstrate the latest software, exchange shareware and public domain software, and publish informative newsletters. There are over 1,000 user groups in the U.S. alone! If you're not involved with a user group, you're really missing out.

Apple provides a toll-free hot line to find out about the user group nearest you. If you want to know how to contact them, call 800–538–9696 ext. 500.

Experiment

Don't be afraid to experiment. Try anything and everything. One of my favorites is to hold down the Option key and select items from menus or tools from a palette. Try this in Excel or Adobe Illustrator. You'll be surprised what pops up! All kinds of hidden dialog boxes and controls are available. Of course, if you read the manual, you'd know all about these "secret" features.

Poke around, try everything! It's impossible to hurt your Mac by playing with software. Just remember to back up important files before you begin to play.

Evaluating Costs

Even though products like Suitcase II, MasterJuggler and Disk-Top are inexpensive, the question "When should I spend money on something?" has probably crossed your mind already.

The items I recommend throughout the book range from shareware that requests a donation of only a few dollars to hard disks and accelerator cards that cost several thousand dollars.

When faced with any cash outlay, you have to ask yourself: "How much time will it save me each day?" Divide the cost of the product by whatever you think your time is worth.

It hardly makes sense to perform this calculation for inexpensive software. But let's assume that you want to justify a *major* purchase, such as a tape backup unit for $900.

Right now, backing up to floppy disks is taking 20 minutes a day. You have to sit there and swap disks, so it can't be done unattended. If you buy the tape drive, you will be able to perform an incremental backup in less than 10 minutes, unattended. That means you can do something else, like go to lunch or go home for the evening. When you return, the backup is complete. So let's say it saves you the full 20 minutes a day.

If your time is worth $20 an hour, you're saving $6.66 a day. So, in less than five months, the tape drive will pay for itself. ($900 divided by $6.66 equals 135 days.)

This approach works beautifully on your boss when you've got your eye on a new piece of hardware or software.

Look at purchases for your Mac as investments in productivity. Evaluate things on the amount of time they'll save you. You'll be surprised at how affordable things become when viewed in this light. If that doesn't work, and you can't live without it, buy it anyway.

Recommendations

Information on obtaining Apple System Software and other products I recommend is listed below.

Apple System Software Updates (includes Installer, MultiFinder, Font/DA Mover, MacroMaker, System, Finder, and more)

- Shrink-wrapped packages, with disks and printed documentation, are available only from Authorized Apple Dealers for approximately $50.

System software files without documentation are available from:

- User groups at variable cost. Some groups will provide it free if you bring your own disk.
- On-line services such as CompuServe, GEnie and MacNet at the cost of connection time only.
- Some Apple dealers. Apple dealers are not *required* to sell you the $50 package. Many, particularly dealers that value their customers, will let you come in when things aren't too busy and copy the files. It's considered polite to purchase the blank floppy disks you use from the dealer.

Microsoft Word (Word)
Microsoft Corporation
16011 N.E. 36th Way
P.O. Box 97017
Redmond, WA 98073–9717
206–882–8088
Approximately $400
512Ke, Plus, SE, II, IIx, SE/30

A word processor with advanced features and a high degree of compatibility with PageMaker desktop publishing software. Word was used in the preparation of both this book and every issue of MACazine since 1987.

DiskTop
CE Software
P.O. Box 65580
West Des Moines, IA 50265
515–224–1995
Approximately $50
512Ke, Plus, SE, II, IIx, SE/30

Possibly the greatest file-management utility ever invented. Get a copy today if you don't already have one.

miniDOS, FileStar, DateKey, and Switch-a-Roo

Shareware or public domain desk accessories and FKEYs (keyboard shortcut programs). Available from user groups or on-line services.

ACTA Advantage
Symmetry
761 E. University Drive
Mesa, AZ 85203
800–624–2485
602–844–2199
Approximately $130
512K, 512Ke, Plus, SE, II, IIx, SE/30

An excellent desk accessory outline processor. It includes an outline processing application with an even higher degree of functionality than the DA. A fine product.

HyperDA
Symmetry
761 E. University Drive
Mesa, AZ 85203
800-624-2485
602-844-2199
Approximately $70
512K, 512Ke, Plus, SE, II, IIx, SE/30

The desk accessory that reads HyperCard stacks—an idea so basic I'm surprised Apple didn't think of it. A must if you use Hyper-Card. Particularly recommended for users with memory constraints (it lets you browse HyperCard stacks on a stock Mac Plus without MultiFinder).

Coach and Coach Professional
Deneba Software
3305 Northwest 74th Avenue
Miami, FL 33122
800-6-CANVAS
305-594-6965
Coach: Approximately $100
Coach Professional (hard disk required): Approximately $200
512Ke, Plus, SE, II, IIx, SE/30

A desk accessory spelling checker that catches mistakes as you type. Coach Professional includes a larger dictionary, concise definitions, and a thesaurus.

DeskPaint and DeskDraw
Zedcor
4500 E. Speedway, Suite 22
Tucson, AZ 85712
800-482-4567
Approximately $130
512Ke, Plus, SE, II, IIx, SE/30

A desk accessory with more features than the original MacPaint! Includes DeskDraw, a MacDraw-like DA. If you work in MacPaint or MacDraw, you'll love these convenient DAs.

Suitcase II

Fifth Generation Systems
11200 Industriplex Boulevard
Baton Rouge, LA 70809
504–291–7221
Approximately $80
512Ke, Plus, SE, II, IIx, SE/30
Requires System 4.1 or later

Allows almost unlimited numbers of fonts, DAs, sounds, and FKEYs to be used without having to be installed in your System file.

MasterJuggler

ALSoft
P.O. Box 927
Spring, TX 77383
713–353–4090
Approximately $90
512Ke, Plus, SE, II, IIx, SE/30
Requires System 4.1 or later

Like Suitcase II, MasterJuggler offers almost unlimited access to fonts, DAs, sounds, and FKEYs. Unlike Suitcase II, MasterJuggler offers a number of unrelated but useful functions. More detailed descriptions of both Suitcase II and MasterJuggler appear in Chapter 6.

Type!

Brøderbund
17 Paul Drive
San Rafael, CA 94903–2101
415–492–3500
800–521–6263
Approximately $30
512K, Plus, SE, II (not tested with IIx or SE/30)

A fine program for learning typing or improving your typing speed. Includes a game, Type!-athlon.

Typing Tutor IV
>Simon and Schuster Software
>One Gulf & Western Plaza
>New York, NY 10023
>800–624–0023
>800–624–0024 (NJ)
>Approximately $60
>512K, 512Ke, Plus, SE (Not tested with II, IIx, or SE/30, but may be compatible. Check with manufacturer.)

Another fine typing program. The game, Letter Invaders, is a little more fun than the game in Type!.

QuicKeys
>CE Software
>P.O. Box 65580
>West Des Moines, IA 50265
>515–224–1995
>Approximately $100
>512Ke, Plus, SE, II, IIx, SE/30

My favorite macro program.

Tempo II
>Affinity Microsystems
>1050 Walnut Street, Suite 425
>Boulder, CO 80302
>303–442–4840
>Plus, SE, II, IIx, SE/30
>Requires System 4.1 or later
>Approximately $150

Another powerful macro program. Chapter 6 has a more detailed report on macros and macro software.

Summary

Because they're always running, your System and Finder are the first things you should suspect when your Mac acts up. If replacing them doesn't clear things up, read the next chapter, "File and Disk Recovery," even if your disks seem to be all right. Many of the techniques used in recovery can also be used to clear up problems *before* they damage your files or disks.

Always use the latest System software. Use the Installer, and always keep a copy of your old System folder contents around until you're sure the update isn't causing any problems. Don't keep more than one System and Finder on any hard disk.

Try to reduce your use of the mouse. Sure, it's easy to grab the mouse, but command-key shortcuts save time. Get into the habit of using them. And don't forget to brush up on your typing. This might be the easiest thing you can do to accomplish more in less time.

Never stop learning about the Mac. Be hungry for new knowledge. Read magazines, go on-line or join a user group—do all three if you can. Remember, you can never know too much.

Experiment whenever you can. Try new techniques. Only you know what will save you time. If you have a hunch, check it out. You can't break your Mac. Just remember, if you're trying anything that seems even remotely dangerous, make sure you have backup copies of anything important.

2

File and Disk Recovery

What to do when disaster strikes.

You may be thinking "I can skip this chapter; all my disks work fine." That would be a big mistake. There are a number of simple precautions you should take that will make recovering files or disks easier if disaster should strike. There are only two kinds of computer users: those who have lost data in a crash, and those who will lose data in a crash.

This chapter is filled with advice for avoiding a catastrophe as well as tips on dealing with the inevitable. So don't skip over it just because you don't need it right this second. I can guarantee that a few minutes spent reading this chapter will save you hours someday.

Even the most skilled file and disk recovery artists don't succeed every time. Some files and disks just can't be recovered. Fire and theft

also make recovery impossible. The point is, a recent backup, preferably kept off-site, is the only thing that can bail you out of serious trouble.

So now that I've terrified you into keeping a backup off-site, let's talk about file and disk recovery. (Besides, there's a whole chapter on protecting your work later in the book.) Someday you'll need to recover a file or disk, no matter how prudent you are about backing up. You're about to learn every trick in the book. You'll be ready.

Program Crashes, System Errors, and the Programmer's Switch

Before we talk about crashed disks and damaged files, here's a little trick you can try when a program crashes (that is, when you get a System error).

Every Mac comes with a little piece of plastic called the *programmer's switch*. Although the Macintosh *Owners' Manual* warns that it's for use only by programmers, that's not true. It can be a time saver for anyone. Install it according to the directions in the Macintosh *Owner's Manual*.

The programmer's switch is actually two switches: the front switch is the reset switch; the rear switch is the interrupt switch.

The reset switch works the same as turning your Mac off and back on with the power switch. If you need to restart your Mac after a crash or freeze, you can push the reset button instead of turning the power off and on.

The interrupt switch can sometimes return you to the Finder after a crash, if you follow the steps listed below. (By the way, the interrupt switch really *is* a programmer's switch. They use it to escape from crashes, too.)

I find it's occasionally worth the effort to try this trick, especially under MultiFinder. Even though you will usually lose any unsaved work in the application you were working in when the crash occurred, you may be able to save work in other applications you have open. For example: let's say you're running Multi-Finder, have documents open in MacWrite and MacPaint, and crash while working in MacWrite. Press the interrupt switch and type the sequences in the next section. If it works, and you're returned to the desktop, you will probably be able to go back into

MacPaint and save your work. You'll lose any unsaved work in MacWrite, but at least you will have saved something.

The method given in the next section works only with certain kinds of System errors. There's no way to tell beforehand whether it's going to work, but if you've crashed, you might want to give it a try.

Crash
Recovery

In the event of a crash or freeze, press the interrupt switch. It sometimes brings up an empty box with a caret (>) prompt. If it does, try typing the following (See Figure 2–1):

SM 0 A9F4 <Carriage Return>

```
> SM 0 A9F4
```
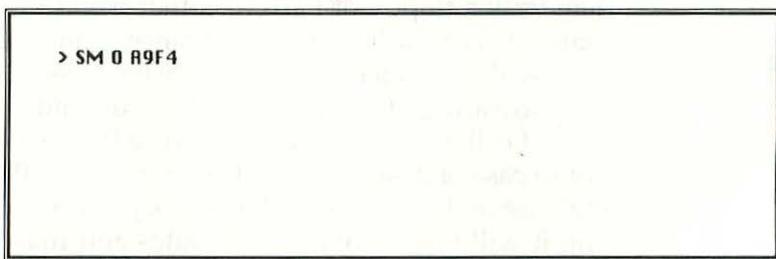
Figure 2–1
Recovering From
a System Error
(Crash) After
Pressing the
Interrupt Switch

The 0s in this line and the next one you'll type are all numeric 0 (zero). Type the characters exactly the way you see them, spaces and all.

After the carriage return, the box will fill with characters but the first line and prompt will remain blank. Type:

G 0 <Carriage return>

That's all there is to it. If it works, you'll be returned to the Finder. If it doesn't work, you'll either get another bomb dialog box, or the box will fill with characters. In either case, press the reset switch to reboot.

Using this trick leaves your Mac in an unstable state. If it does work, do whatever housekeeping you need to do (that is, save unsaved documents if you're running MultiFinder), then restart your Mac using the Finder's Restart command. The Finder's Restart sequence is infinitely better for your Mac than a crash. Using it minimizes the chance of damage to your Desktop or disk directories.

I've got a slip of paper taped to my monitor with the sequence just discussed written on it. You might want to do the same. Mine looks like this:

```
SM 0 A9F4 <CR>
G 0 <CR>
```

File and Disk Recovery

Although there's little you can do when you get a System error, there are a number of things you can do when you have a problem with a floppy or hard disk that won't boot or asks to be initialized. With a little bit of advance planning, you can create a floppy disk, which I call a "Disaster Disk," that will go a long way toward getting damaged disks up and running.

I call it a Disaster Disk because it's the first thing you reach for in case of disaster. Your Disaster Disk will be your first line of defense in the event your hard disk or floppy disk crashes. Creating it will take only a few minutes and may save you hours of frustration someday. Essentially, what you'll be doing is creating a start-up disk with your disk recovery tools on it. Complete instructions for creating your own Disaster Disk, for both hard and floppy disk users, follow.

Making a Disaster Disk (Hard Disk)

Here are step-by-step instructions for creating your Disaster Disk if you own a hard disk:

1. Initialize an 800K disk.

2. Name the disk "Disaster Disk."

3. Create a new folder on your Disaster Disk. Call it "System Folder."

4. Copy the System and Finder from your hard disk into the System Folder on your Disaster Disk. It is important to use the System and Finder from your hard disk—the one you use everyday. You've probably made modifi-

cations to the System or Finder on your hard disk (added or deleted fonts or DAs). If the System or Finder on your hard disk is damaged, having copies on your Disaster Disk will allow you to replace them easily. It also means that your Disaster Disk is a start-up disk—you'll need one if your hard disk isn't working.

5. Copy the initialization software that came with your hard disk to your Disaster Disk. Every hard disk comes with software to initialize the disk and install drivers. Apple's is called HD SC Setup; Jasmine (another hard disk manufacturer) calls theirs DriveWare. The initializing software is usually supplied on a floppy disk with its own System and Finder. Copy only the utility itself to your Disaster Disk. (You should already have a System and Finder on your Disaster Disk—you copied them from your hard disk a minute ago.)

6. Copy Disk First Aid from an Apple System Tools disk to your Disaster Disk. Disk First Aid is a program supplied by Apple with System Software releases. It's able to repair minor damage to disks automatically.

7. Select Disk First Aid and, using the Finder's "Set Startup" command, make Disk First Aid the start-up application. To do this, select Disk First Aid on the Disaster Disk by single-clicking it and then choose Set Startup from the Special menu. A dialog will confirm your choices. Now, the next time you start your Mac using the Disaster Disk, it will open automatically to Disk First Aid instead of opening to the Finder as it normally would.

That's all there is to it. Use any remaining space on your Disaster Disk for Disk Clinic from SUM (Symantec Utilities for Macintosh) or 1st Aid Kit—both excellent file and disk recovery programs that are described in the "Recommendations" section at the end of this chapter.

Now put your Disaster Disk in a safe place and hope you never need it.

Making a
Disaster Disk
(Floppy Disk)

These instructions assume that you have at least two 800K drives. If you have fewer than that, you're a brave soul. Good luck.

Here's how to create a Disaster Disk if you only own floppy disk drives:

1. Initialize an 800K disk.

2. Name the disk "Disaster Disk."

3. Create a new folder on your Disaster Disk. Call it "System Folder."

4. Copy the System and Finder from your start-up disk into the System Folder on your Disaster Disk. It is important to use the System and Finder from your most frequently used start-up disk—the one you use everyday. You've probably made modifications to the System or Finder on it (added or deleted fonts or DAs). If the System or Finder on this start-up disk is damaged, having copies on your Disaster Disk will allow you to replace them easily. It also means that your Disaster Disk is a start-up disk—which is what you'll need if your favorite start-up disk isn't working.

5. Copy Disk First Aid from an Apple System Tools disk to your Disaster Disk. Disk First Aid is a program supplied by Apple with System Software releases. It's able to repair minor damage to disks automatically.

6. Select Disk First Aid and, using the Finder's "Set Startup" command, make Disk First Aid the start-up application. To do this, select Disk First Aid on the Disaster Disk by single-clicking it and then choose Set Startup from the Special menu. A dialog will confirm your choices. Now, the next time you start your Mac using the Disaster Disk, it will open to Disk First Aid instead of opening to the Finder as it normally does.

That's all there is to it. Use any remaining space on your Disaster Disk for Disk Clinic from SUM (Symantec Utilities for Macintosh) or 1st Aid Kit, both excellent file and disk recovery programs that are covered in the recommendations at the end of this chapter. Now put your Disaster Disk in a safe place and hope you never need it.

Recovery Details

There are a few things you should know before we get down to the nitty-gritty of recovering programs and data.

First, this chapter discusses a number of techniques for recovering crashed disks. Although I assume that you're working with a hard disk, all of these methods can be used successfully to recover a floppy disk.

Second, these aren't just recovery tools. This chapter is worth reading even if you've never crashed a disk. Sometimes you can detect trouble brewing through warning signals your Mac will give you. For example, you know you're heading for trouble if your Mac bombs more often than usual, or if everything seems to be slow (saving, quitting, opening, and so on). Or if the menus don't seem to work quite right, or DAs quit unexpectedly. Or if you get the old "An application can't be found for this document" dialog box when you know darn well you have MacWrite on the hard disk. If you experience any of these warning signs, you might consider doing a bit of "preventive maintenance" (more about that later).

The first thing to do when things start acting strange is to copy any important and un-backed-up files to another disk. Then restart your Mac.

Power User Voodoo A lot of strange behavior can be fixed by nothing more than a restart. When a friend calls you over to show you that his Mac is doing something strange, restart it. Half the time, it'll come back up and be fine. He'll think you're a genius. Don't forget to "Save" whatever he's working on before you restart, though.

What To Do
When Your
Hard Disk
Doesn't
Boot

The first thing to remember is not to panic. I've had problems with dozens of hard disks in my day, and only once was all the data on the disk lost. In every other case either I or the manufacturer was able to recover everything or almost everything on the disk. So no matter what the symptoms, and even if your backup is old or nonexistent, don't panic.

You've probably done it already, but take a moment to double-check all the cables and power cords. Shut down all of your equipment and unplug and replug all the cables. Remember, stay calm. If it can be fixed, we'll fix it.

Now, turn your hard disk on, if it's an external model. Next, power up the Mac with your Disaster Disk in the internal disk drive (see the earlier section on Disaster Disks). Remember, you've set Disk First Aid to be the start-up application on the Disaster Disk, so instead of starting in the Finder, you'll start in Disk First Aid. At this point, one of four things will happen:

- *Situation 1.* Nothing happens.

- *Situation 2.* The Mac boots, but asks if you want to initialize your hard disk (for heaven's sake, say no!).

- *Situation 3.* The Mac boots and, using the Drive button in Disk First Aid, you can see the Disaster Disk but not the hard disk. Because the Disaster Disk is the only disk available, the Drive button is grayed out (Figure 2–2).

- *Situation 4.* The Mac boots and, using the Drive button in Disk First Aid, you can see the Disaster Disk and the hard disk. In Figure 2–3, clicking the Drive button would allow you to select either the Disaster Disk (left) or the hard disk (right).

```
┌──────────────────────────────────────┐
│                                      │
│          Disaster Disk               │
│                                      │
│       (Internal Floppy Drive)        │
│      ............................     │
│                                      │
│      ┌ Drive ┐     ┌ Cancel ┐        │
│                                      │
│      ┌ Eject ┐     ┌ Open ┐          │
│                                      │
└──────────────────────────────────────┘
```
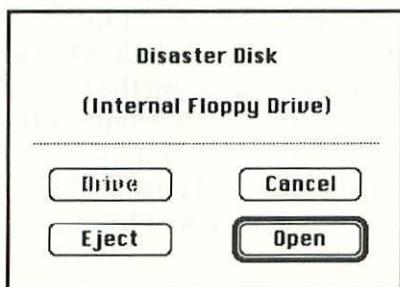
Figure 2-2
Disk First Aid with
Only the Disaster
Disk Available

```
┌──────────────────────────────┐   ┌──────────────────────────────┐
│                              │   │                              │
│        Disaster Disk         │   │     --Disk With Bad Name--    │
│                              │   │                              │
│     (Internal Floppy Drive)  │   │     (A Hard Disk , SCSI 2)    │
│   ........................    │   │   ........................    │
│                              │   │                              │
│   ┌ Drive ┐   ┌ Cancel ┐     │   │   ┌ Drive ┐   ┌ Cancel ┐     │
│                              │   │                              │
│   ┌ Eject ┐   ┌ Open ┐       │   │   ┌ Eject ┐   ┌ Open ┐       │
│                              │   │                              │
└──────────────────────────────┘   └──────────────────────────────┘
```
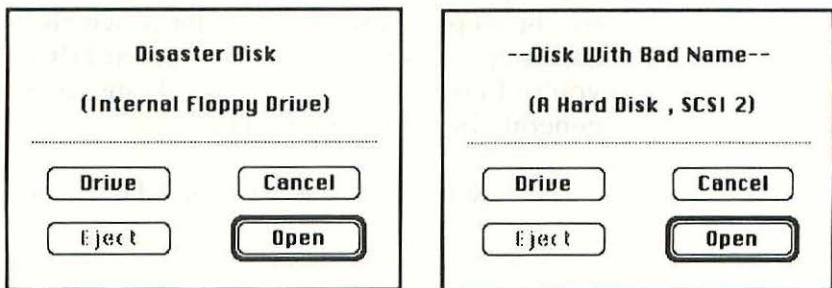
Figure 2-3
Disk First Aid with
Two Disks
Available

What To Do in Situation 1. If you power up or restart your Mac with the Disaster Disk in the internal drive and nothing happens, you may have a serious hardware problem. Before you panic, try another start-up disk—it's possible your Disaster Disk had a disaster of its own. If, after turning everything off and disconnecting the hard disk, you're still seeing a sad Mac icon or a flashing question mark when you try to boot with several different start-up disks, your Mac itself needs repairs. See your local service technician. There's nothing more you can do.

What To Do in Situation 2. If you power up or restart your Mac with the Disaster Disk in the internal drive and the Mac boots, but asks you if you want to initialize your hard disk, for heaven's sake, say no! Initializing the disk would make recovery much more difficult. There are a still a few tricks you can try. If you can, try each of the fixes listed on the next page in turn. Whatever you do, don't initialize your hard disk yet!

What To Do in Situation 3 or 4. In these situations, when you power up or restart your Mac with the Disaster Disk in the internal drive, the Mac boots and, using the Drive button in Disk First Aid, you can see the Disaster Disk only (situation 3) or both the Disaster Disk and the hard disk (situation 4). Go through the steps outlined in the next section, "Hard Disk Recovery." Take these steps one at a time, trying to reboot from your hard disk between each step.

Hard Disk
Recovery

When you need to recover programs and/or data on a hard disk, try the steps below, in the order in which they are given. After each step, try rebooting from your hard disk. If rebooting works, you're finished. If it doesn't work, move on to the next step. In general, the steps are as follows:

1. Repair the disk with Disk First Aid.

2. Install new drivers.

3. Rebuild your Desktop.

4. Replace your hard disk's System and Finder.

5. Zap your PRAM/check your batteries.

6. Resolve INIT conflicts.

7. If you have more than one SCSI device:
   Check your terminators.
   Resolve SCSI ID conflicts.

8. If your hard disk still won't mount: Use SUM (Symantec Utilities for Macintosh) or 1st Aid Kit.

Details about each step are provided in the sections that follow.

Attempt to Repair the Disk with Disk First Aid Your Disaster Disk is set to start-up to Disk First Aid. Power up your hard disk (if it's an external one), then restart your Mac with the Disaster Disk in the internal drive. After the booting procedure is complete, you'll be in Disk First Aid (Figure 2–4). Click on the Drive button. If you see a disk called "Disk With Bad Name," it's probably your hard disk. Click the Open button.

File Edit Options

```
              --Disk With Bad Name--

                (A Hard Disk , SCSI 2)


              Drive          Cancel

              Eject          Open
```
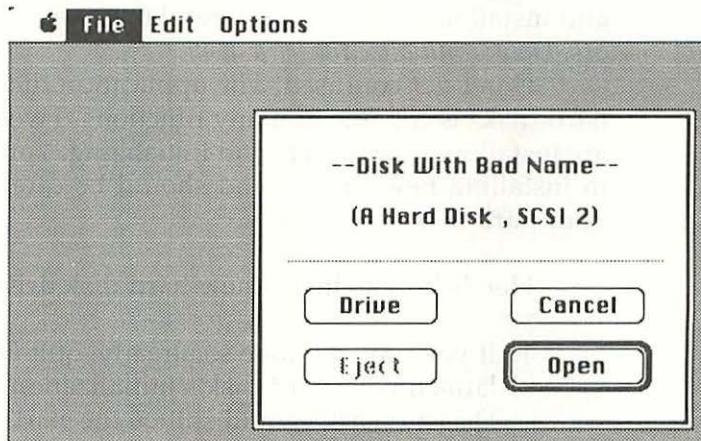
Figure 2-4
Disk First Aid
Showing a
Damaged Hard
Disk

This should bring up the screen shown in Figure 2–5. Pull down the Options menu and select Repair Automatically. Then click the Start button.

You'll probably get some kind of message like "Repair Successful," "No Repair Needed," or "Unable to Repair Disk." In any case, quit Disk First Aid and reboot.

If that didn't fix whatever was wrong, or if you couldn't locate your hard disk by clicking the Drive button, don't worry. Try installing new drivers next.

 File Edit Options

```
Ready to start.

Volume: (A Hard Disk , SCSI 2)

           Start              Stop

           Resume             Pause
```
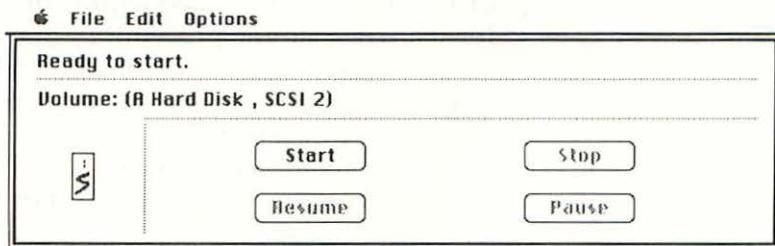
Figure 2-5
Disk First Aid
Ready To Begin
Repairs

Install New Drivers Drivers are small bits of information your hard disk's initialization software places on the hard disk. These drivers tell it how to interact with your Mac. If they become damaged, as they can from a crash or power interruption, they may cause your hard disk to crash or refuse to mount. That's why we're going to try to replace them now. This procedure is non-destructive; it won't harm the data on your drive.

Most hard disks come with software used to both *initialize* and install new drivers. Be careful that you only write new drivers. *Do not initialize the hard disk!*

Don't get confused. The application that comes with most hard disks is capable of many functions. Two of those functions are installing new drivers and initializing. You're only interested in installing new drivers and should be careful *not* to initialize your hard disk accidentally.

Here's how to install new hard disk drivers:

1. If you haven't done so already, quit Disk First Aid and launch your hard disk's initialization software. The Disaster Disk should still be the start-up disk.

2. Determine whether the initialization software can "see" your hard disk. How you do this depends on which hard disk you're using. At the top of Figure 2–6, you can tell that the software sees three SCSI devices: my Technology Works internal hard disk (SCSI ID 0), my Irwin Magnetics tape drive (SCSI ID 3), and my Jasmine hard disk (SCSI ID 4).

3. If the software *can* see your hard disk, follow the instructions in your hard disk manual for installing drivers (sometimes called *writing* or *updating* drivers). It's usually a simple procedure—one or two mouse clicks. If you don't have a manual and are not absolutely certain what to do, call the hard disk manufacturer for technical support.

    If the software *can't* see your hard disk, or you can't select its icon using Disk First Aid or your hard disk
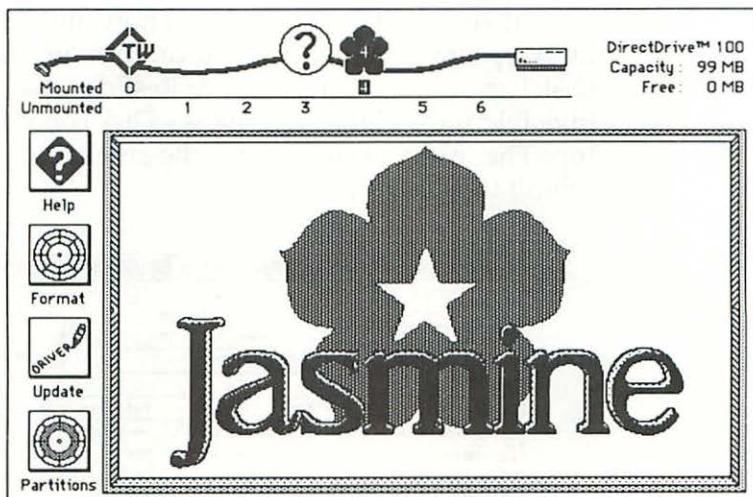
Figure 2-6
Updating the
Drivers on a
Jasmine Hard Disk

initialization software, see the section later in this chapter entitled "If Your Hard Disk Still Won't Mount."

4. Quit the hard disk software and try rebooting from your hard disk by ejecting your Disaster Disk from the internal drive and selecting Restart from the Special menu in the Finder.

If writing new drivers didn't fix it, try rebuilding your Desktop.

Rebuild Your Desktop The Macintosh stores an invisible file, called the *Desktop,* on every disk. It keeps track of what's stored where, and which applications are available for opening documents. As you might guess, the Desktop file for a hard disk with thousands of files can be huge. A large Desktop file slows down a lot of things, such as quitting to the Finder. The Desktop isn't a very good housekeeper either—it sometimes retains information about files that have long since been deleted. This excess information makes the invisible Desktop file grow even bigger. Large Desktop files also have a tendency to become corrupted or damaged over time, which can lead to System crashes or disks that won't mount (that is, whose icons won't appear in the Finder).

If you want to get an idea of how much space your invisible Desktop file is taking up, you can use any utility (for example, DiskTop, miniDOS, FileStar, or ResEdit) that allows you to view invisible files. Figure 2–7 shows DiskTop displaying my Desktop. The insert, which shows the smaller size of 127K, is after I rebuilt the Desktop.
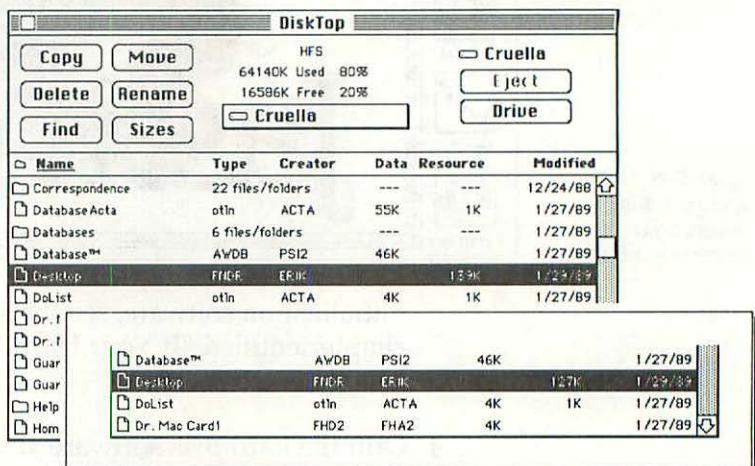
Figure 2–7
Invisible Desktop
File Before and
After Rebuilding

By the way, there's a chance here for confusion. The gray area in the Finder (or the patterned area if you've used the Control Panel to change it) is commonly referred to as the *desktop*. The invisible file created by the Finder to keep track of where things are is also called the *Desktop*. I've used the capitalized version to refer to the invisible file stored on your disks and the lower-case version to refer to the gray desktop area on your screen.

If you can get your hard disk to mount, and you can see its icon on the Finder's gray desktop, you should try to rebuild your invisible Desktop file. You should also rebuild your desktop any time things start acting weird—when quitting to the Finder takes *way* too long or when it takes too long to see your hard disk icon at start-up time. I consider rebuilding the Desktop preventive maintenance. If my Mac crashes twice in the same day, the first thing I do is rebuild my Desktop.

The only ill effect of rebuilding your Desktop is that you'll lose the comments in the "Get Info" boxes of everything on the disk (Figure 2–8). I find it a small price to pay. If you're really in love with the idea of commenting icons, DiskTop has a feature called CE Comments that allows you to store comments that will survive a Desktop rebuilding. Personally, I don't use this feature, but I know people who do.

If you can get a disk to mount (that is, if its icon does appear in the Finder), you can rebuild its Desktop. Here are three different ways to do it:

- Rebuild Desktop 1: Start your Mac while holding down the Command and Option keys. For every disk that mounts, you'll get a dialog box that asks, "Are you sure you want the Desktop rebuilt on the disk 'Your Hard Disk'? This may take a few minutes." (You'll see whatever you've named the disk instead of "Your Hard Disk.") Click OK. That's all there is to it. Your Mac will whir and spin for a few minutes, then you'll have a brand new, slimmed down Desktop.

- Rebuild Desktop 2: Quit any application while holding down the Command and Option keys. You'll get the same dialog box as described above. You cannot be running under MultiFinder to rebuild the desktop this way.

- Rebuild Desktop 3: Use a Finder replacement desk accessory such as DiskTop to delete the Desktop. Because these DAs can see invisible files, you can select and delete the Desktop easily. You can't do this while in the Finder; you must be in an application or you'll get a "File is Busy" message. You'll also get a "File is Busy" message if you're running MultiFinder. So you must be running an application, and you must be in the Finder, not the MultiFinder, mode.

	Info

BOOK

Kind : folder
Size : 33,241 bytes used, 39K on disk,
        for 12 files
Where : Cruella, SCSI Driver, ID 0

Created : Sun, Jun 5, 1988, 10:42 AM
Modified : Fri, Jan 27, 1989, 1:39 PM

This is a "Get Info" comments box. Its contents
will be erased if you rebuild the invisible
Desktop file. Big deal. If you REALLY care about
them, get DiskTop, which includes a commenting
feature that survives Desktop rebuilding!

Figure 2–8
A "Get Info" Box
with Comments

When you use DiskTop to delete the Desktop file
and then Quit DiskTop and the application, there will
be a delay as your Mac builds a new Desktop file. The
length of the delay depends on the number of files, but
you'll see the watch cursor to tell you that your Mac is
still working.

Now restart your Mac and let it try to boot from the hard
disk (remove your Disaster Disk from the internal drive). If you're
still unable to boot from the hard disk, try replacing your System
and Finder.

Replace Your Hard Disk's System and Finder Crashes (and gremlins) can cause your System or Finder to become damaged or corrupted. If your hard disk mounts but you can't boot from it (that is, if you can see its icon in the Finder when you boot from another start-up disk, but your Mac won't start up from it), a damaged System or Finder may be the problem. Fortunately, we've planned for this problem by storing a fresh, uncorrupted copy of your System and Finder on your Disaster Disk.

If you haven't already done so, quit Disk First Aid and return to the Finder. Remember, every time you boot from your Disaster Disk you'll be in Disk First Aid and will have to quit it to get back to the Finder.

Next, open the System Folder on your Disaster Disk and select the System and Finder files. Drag them to the System Folder on your hard disk. You'll see a dialog asking if you want to replace files of the same name. You do.

Now restart your Mac and let it try to boot from the hard disk (remove your Disaster Disk from the internal drive).

If you're still unable to boot from the hard disk, try zapping the PRAM or resolving INIT conflicts. And, if you have more than one SCSI device, you may need to resolve ID conflicts or add or remove an external terminator.

Zap Your PRAM/Check Your Batteries Your Mac has a small amount of internal RAM known as PRAM which keeps your Mac's clock running and stores things like serial (modem and printer) port configurations. Another easily fixed problem is messed-up PRAM (Parameter RAM).

Some of the more obvious signs of PRAM problems are when your Mac clock doesn't work right and the Chooser forgets its settings. If either of these things happens to you, try zapping the PRAM as described on the next page. If that doesn't fix it, replace your Mac battery. (The Mac SE, SE/30, II and IIx and IIcx have their batteries soldered to the logic board, so if you suspect battery failure and have tried zapping your PRAM, see your dealer.)

- PRAM zap for Mac 512 and Plus:

  Turn off your Mac and disconnect the power cord. Now remove the battery; it's in a little door on the back of your Mac. After about 10 minutes, replace the battery. This works because the battery provides power to the PRAM when the Mac isn't powered up.

  That's it. It's been zapped! Use the Control Panel to reset your clock. If the trouble continues, try a new battery.

- PRAM zap for Mac SE, SE/30, II, IIx, and IIcx :

  Because your battery is soldered into place, you'll use a different but no less physically taxing technique. Hold down the Option, Shift, and Command keys while you select Control Panel DA from the Apple menu. That finger contortion will result in a dialog box asking if you really want to zap the PRAM. Say yes. Don't forget to reset your clock from the Control Panel DA afterwards.

This may help even if your hard disk doesn't mount. Now restart your Mac and let it try to boot from the hard disk (remove your Disaster Disk from the internal drive).

Resolve INIT Conflicts At this point, you've replaced your System and Finder, rebuilt the Desktop, and zapped the PRAM, but you still can't boot from the hard disk. The next thing to consider is an INIT or CDEV conflict.

INITs and CDEVs are small programs you place in your System Folder that are installed automatically at boot time. When you View by Kind in the Finder, INITs and CDEVs show up as Startup Documents and Control Panel Documents, respectively. Pyro, Suitcase II, TOPS, and QuicKeys are examples of such programs.

In most cases, you can use quite a few INITs and CDEVs simultaneously. Occasionally, a conflict will occur that will prevent your hard disk from booting.

When you have an INIT or CDEV conflict, every time you start up your Mac with the offending INITs or CDEVs in your System Folder, you crash or hang at exactly the same point in the start-up process. Many INITs and CDEVs draw their icons on your screen at start-up time, and sometimes you can identify the culprit by looking for the icon that appears immediately before the crash or hang.

Even if you can't identify the culprit by its icon at start-up, you can resolve an INIT or CDEV conflict by following these steps:

1. Boot from your Disaster Disk.

2. Quit Disk First Aid and return to the Finder.

3. Create a new folder on your hard disk, name it "INITs," and place it somewhere convenient. The idea is to remove all of the INITs and CDEVs from your System Folder. If they're in *any* folder but the System Folder at boot time, they won't be activated.

4. Open the System Folder on the hard disk. If you suspect that the trouble is being caused by a specific INIT or CDEV (remember what I said about watching the icons at boot time), drag that INIT or CDEV out of the System Folder and into the INITs folder. If you're not sure which INIT or CDEV is causing the problem, drag every INIT and CDEV out of your hard disk's System Folder and into the INITs folder.

   You may find it helpful to view the contents of the System Folder "by Kind" instead of "by Icon" for this operation. With your System Folder open, select "by Kind" from the View menu. This will group your INITs and CDEVs. (Remember, INITs are called "Startup Documents"; CDEVs are called "Control Panel Documents.") You'll probably have to scroll down to see the Startup Documents. I've got more than 100 files in my System Folder, so I have to scroll down quite a way to get at mine, as you can see in Figure 2–9.

Name	Size	Kind	Last Mo...	
BigThes Helper	6K	Startup doc...	12/28/88	3:43 PM
Capture	5K	Startup doc...	9/12/88	10:5...
Coach Helper	72K	Startup doc...	5/18/88	7:21 PM
DATA◇PAK Init	8K	Startup doc...	6/14/88	11:4...
DialogKeys	3K	Startup doc...	12/10/87	3:47 PM
FileMagic™	23K	Startup doc...	12/6/88	3:46 PM
key Ahead	2K	Startup doc...	6/27/88	11:2...
MasterJuggler™	210K	Startup doc...	1/29/89	10:4...
Shield INIT	21K	Startup doc...	12/3/88	4:31 PM
Roo File	2K	Switch-A-R...	1/8/89	8:31 AM
Backgrounder	6K	System doc...	4/30/88	12:0...
Clipboard File	2K	System doc...	1/29/89	11:1...
Finder	105K	System doc...	1/28/89	2:51 PM
JWritePref	2K	System doc...	1/25/89	8:11 PM
MacinTalk	29K	System doc...	5/13/87	5:07 PM
MultiFinder	50K	System doc...	8/26/88	12:0...
Scrapbook Business	954K	System doc...	12/14/88	8:20 PM
Scrapbook Comp...	669K	System doc...	12/24/88	8:59 AM
Scrapbook File	972K	System doc...	12/24/88	7:41 AM
Scrapbook File II	1,850K	System doc...	12/14/88	8:19 PM
System	252K	System doc...	1/29/89	7:59 AM
Vantage Dictionary	102K	Vantage Ope...	10/22/88	8:50 AM
Vantage User Dic...	3K	Vantage Ope...	11/7/88	10:0...

*Figure 2–9
Viewing the
System Folder's
Contents by Kind*

5. Eject your Disaster Disk and restart your Mac, allowing it to boot from the hard disk.

If that procedure worked, you had a conflict. To find out which INIT or CDEV was causing the problem, drag each INIT and CDEV back into the System Folder one at a time, rebooting each time you add one. At some point, the hard disk won't boot. Just remember the last INIT or CDEV you added and put it anywhere but your System Folder. It's the culprit. It conflicts with

something else, probably another INIT or CDEV, on your hard disk. You will either have to live without it, or keep experimenting until you figure which INIT or CDEV it conflicts with so that you can remove that one instead.

Another thing you can try is to rename the conflicting INIT or CDEV. Try names that begin with "a" or "z." ("QuicKeys" would become either "aQuicKeys" or "zQuicKeys.") This works because INITs and CDEVs are loaded in alphabetical order. Often two INITs or CDEVs that conflict with their original names can be tamed by changing the order in which they are loaded.

Finally, there are a couple of small utilities for use in just this situation. One is called Aask, and it is part of CE Software's MockPackage Plus Utilities. It lets you turn on or off any of your INITs and CDEVs. You still have to reboot for the changes to take effect, but it sure beats dragging INITs and CDEVs in and out of the System Folder one at a time. Another good product for these situations is called INIT Picker, from MicroSeeds. There's more information about these products in the "Recommendations" section at the end of the chapter.

If You Have More Than One SCSI Device: Check Your Terminators A *SCSI device* is one that connects to the Mac via the SCSI port. ("SCSI" stands for "Small Computer Systems Interface" and is pronounced "scuzzy.") There are a couple of things that can go wrong when more than one SCSI device is connected. First, there's the terminator issue. Terminators are little devices that help prevent noise and strange behavior on the SCSI bus. They look like the 25- or 50- pin plug you find on a SCSI cable, but they have no cable attached. Because almost all SCSI devices have two cable connectors to allow daisy-chaining, you plug the terminator into the last unoccupied cable connector in the SCSI chain. External terminators should be available from your local dealer.

Some devices, such as most internal hard disks, have their own internal terminator. Others, such as Apple's Tape Drive, require an external terminator.

Here are the rules for terminators:

- If you have more than one SCSI device connected, there must be a terminator at each end of the SCSI chain.
- There should be no more than two terminators on the SCSI chain.
- If you only have one device connected, it should be terminated.

Check your owner's manual to find out if your device is internally terminated.

Once you've verified proper termination on your SCSI bus, restart your Mac and let it try to boot from the hard disk (remove your Disaster Disk from the internal drive).

Another thing to try if you suspect a problem in your SCSI chain is to use a different cable. There are some experts who believe that using longer or shorter SCSI cables will reduce the likelihood of failure on the SCSI chain. (The camps are evenly divided between longer and shorter.) If you can't think of any other reason you're having a problem, you might try a longer or shorter cable. I've been told it often helps.

Even if you decide to use one or two longer SCSI cables, it's best to keep the total length of your SCSI chain as short as possible. If the furthest device is more than 20 feet from your Mac, you may have problems.

If You Have More Than One SCSI Device: Check for SCSI ID Conflicts Another problem you may encounter with multiple SCSI devices is the dreaded SCSI ID conflict. This occurs when two devices are assigned the same SCSI ID number.

The Macintosh allows you to connect up to six external or internal SCSI devices. Each can be assigned an ID number (don't use 7 or 0; they're reserved for the Mac itself and for an internal hard disk, respectively). Some devices (SuperMac hard drives, for example) allow you to select the SCSI number using software, others require you to set dip switches or thumbwheels. Again, consult your owner's manual for details.

If you go back and look at Figure 2–6, you'll see that my Technology Works internal hard disk is assigned SCSI ID 0, my Jasmine hard disk is assigned SCSI ID 4 and my Irwin Magnetics tape drive is assigned SCSI ID 3. Had both the Irwin and Jasmine devices been assigned the same ID—say, SCSI ID 3—there would be a conflict on the SCSI chain. The Mac would refuse to boot until I disconnected the SCSI devices or changed the ID number of one or both. The key point is that no two SCSI devices can be assigned the same ID number.

Once you've verified that every device on your SCSI bus has a different ID number, restart your Mac and let it try to boot from the hard disk (remove your Disaster Disk from the internal drive).

Your Mac will attempt to boot from the Startup Device with ID 0 first (Apple internal drives are shipped set to ID 0) unless there's a start-up floppy in one of the drives. Of course, if there's a start-up disk in a floppy disk drive, the floppy drive automatically becomes the start-up device.

The Mac ROM looks for a start-up disk in the following places:

- Internal floppy disk drive
- External floppy disk drive (if one is connected)
- SCSI device with the SCSI ID number 0 (must be a start-up disk—with a System and Finder)
- The SCSI device with the highest ID number between 1 and 6 (must be a start-up disk—with a System and Finder)

If, after looking in all those places, the Mac doesn't find a start-up disk, you will see a flashing question mark on your screen.

My Mac boots from the Technology Works internal drive because it is numbered 0. If I wanted to start up from the Jasmine, I would select Startup Device in the Control Panel DA and change it. Figure 2–10 shows how I would make the Jasmine my Startup Device. Of course, the Jasmine would need to be a start-up disk with a System Folder, or the Mac would continue looking in the SCSI chain until it found a start-up disk.
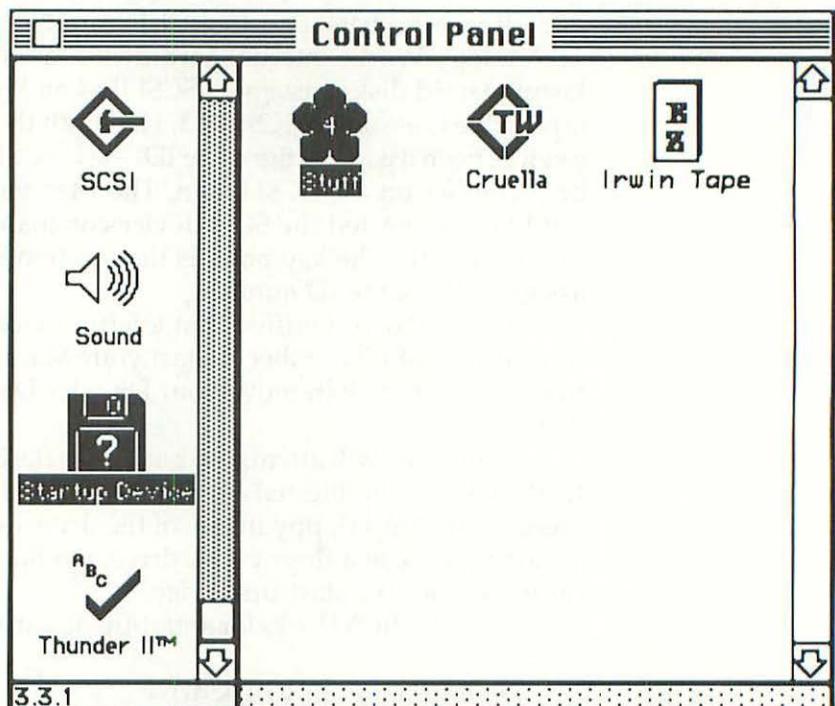
Figure 2–10
Making the
Jasmine Drive My
Startup Device

If Your Hard Disk Still Won't Mount If none of the steps so far has gotten your hard disk to mount, there are still things you can try. Symantec Utilities for Macintosh (SUM) or 1st Aid Kit can sometimes recover the contents of a disk even when it won't mount. SUM can even repair it under certain circumstances. If you're sure you've exhausted your options, if you have a complete backup, and if your hard disk's initialization software recognizes the hard disk, you might try to initialize the disk and restore it from your backup.

Otherwise, return it to the dealer (or manufacturer) with explicit instructions to attempt to salvage the data if possible. And keep your fingers crossed.

Recommendations

There are a couple of programs, SUM and 1st Aid Kit, that can be invaluable in recovering disks and files that can't be recovered using the techniques in this chapter. Neither is expensive, and they provide an additional level of insurance against down time due to a crashed disk or damaged file. A number of other products are also useful; all are listed below.

SUM (Symantec Utilities for Macintosh)
Symantec Corporation
10201 Torre Avenue
Cupertino, CA 95014
408–253–9600
Approximately $100
512Ke, Plus, SE, II, IIx, SE/30

Don't wait until disaster strikes to get a copy of SUM. It's one of the most amazing products I've ever seen. It makes it easy to recover deleted or trashed files from hard or floppy disks. You can even recover an accidentally initialized hard disk. The SUM package includes three different file-recovery programs, a hard disk optimizer, a fast floppy copier, a partitioning utility, and a disk and file editor. This is a first-class collection of utilities, and one you shouldn't wait to buy. It's so useful in emergencies, Apple should include it with every Mac! (Jasmine *does* include it with every hard disk they sell.) About the only thing SUM can't do is recover an initialized floppy (that is, one that has been completely erased or has had its contents replaced with the contents of another disk, as happens when you drag the icon of one floppy onto the icon of another in the Finder). I don't know of anything that can do that.

SUM has been around a while; in the old days it was known as MacZap. Power users loved its powerful tools for recovering crashed disks and files and hated its arcane interface and confusing documentation. In early 1988, Symantec acquired the rights to it. The result was SUM, which was programmed by original MacZap programmer Les Herbst, with help and guidance from Symantec. It is a million times better than MacZap ever was.

Where MacZap required constant trial and error, SUM guides you through the recovery process in an intelligent and highly intuitive manner. Its Disk Clinic (Figure 2–11) asks you questions and decides what to do next based on your responses. MacZap was for diehards; SUM is for anyone who needs to recover a file or disk.
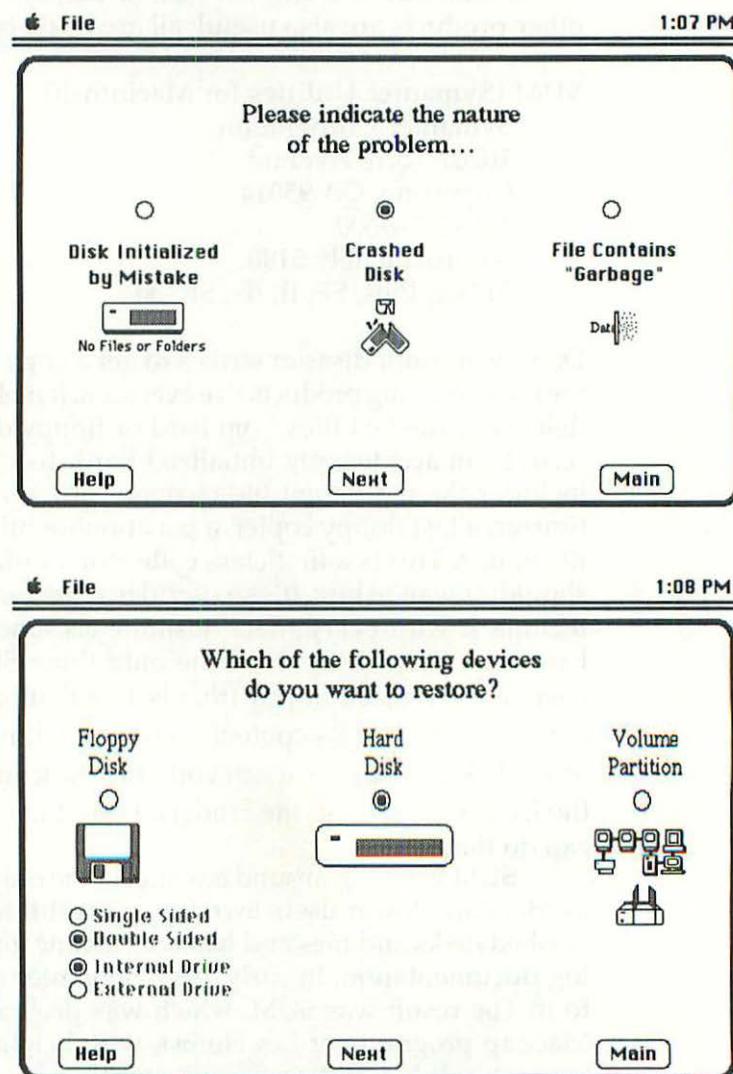

Figure 2–11
Disk Clinic Guides
You Through the
Recovery Process

SUM will require a small bit of advance planning on your part, though. For maximum effectiveness, you need to drag SUM's Shield INIT into your System Folder. Next, reboot and follow the simple instructions in the manual, which will create two invisible files that assist SUM in recovering damaged disks and files. It's painless and will take only a couple of minutes. The manual's instructions are excellent, and the few minutes you spend preparing your hard disk with SUM will be time well spent.

Shield INIT is a Startup Document and is active every time you start your computer (as long as it's in the System Folder). It updates the invisible files you created when you first installed it, making it easier for SUM to recover files and disks after a crash. Since I installed Shield INIT, I've had occasion to use SUM to recover files. In every case it's been the easiest, fastest, and most painless method I've ever used. Don't wait until it's too late—installing the INIT today could allow you to recover your disk more easily tomorrow.

Even though SUM is extremely easy to use, give the manual a careful reading. It's possible to damage files when attempting their recovery if you're not sure what you're doing.

1st Aid Kit

1st Aid Software, Incorporated
42 Radnor Road
Boston, MA 02135
800–THE–FIXR (800–843–3497)
Approximately $100
512Ke, Plus, SE, II, IIx, SE/30

1st Aid Kit (not the same as Disk First Aid which comes with Apple System software) is another excellent recovery program. Before MacZap metamorphosed into SUM, this was the best product for non-hackers, and it's still a darn good file-recovery tool. It will diagnose and attempt to recover files from most situations. And the recently added Quick Cure feature can often recover your disks or files with no more than a couple of mouse clicks. Figure 2–12 shows how easy to use 1st Aid Kit is. All you do is select the files you want to recover, then select Diagnose & Recover from the Disk Repair menu.

⌂	Disk	Edit	Disk Repair	File Repair

Diagnose & Recover...
Salvage Files by Tags...
Copy Diskette...
Fix Boot Blocks...

Help...

Displaying Dis

Select a file: ast Modified   DF   RF   Total

	CALL CECIL			'24/88 7:01 AM	1K	1K	2K
	=Word			'5/88 1:33 PM	1K	350K	350K
	Applications			'20/88 6:18 PM			
	FullPaint	MPNT	APPL	7/31/87 2:19 PM	OK	147K	147K
	=WorksPlus Spell	PSIP	APPL	9/21/87 5:44 PM	OK	9K	9K
	Another Globe	Spin	APPL	9/13/88 5:54 PM	16K	13K	29K
	Canvas Prefs	DAD	defd	7/31/87 5:07 AM	5K	1K	5K
	Canvas™	DAD	APPL	10/24/87 5:12 PM	OK	253K	253K
	Cricket Draw 1.1	CRDW	APPL	12/1/87 9:33 AM	OK	311K	311K
	Dialog Editor	XLDE	APPL	5/19/88 12:00 PM	OK	26K	26K
	Dictionary.wn	nX^n	nX^w	6/24/88 8:56 AM	107K	OK	107K
	Excel.Help	XCEL	XHLP	5/6/88 10:54 AM	OK	83K	83K
	FileMaker4			8/29/88 4:11 PM			

| Catalog Disk		Eject	Drive	Cancel
View Text	Fix Identity		Copy File	Delete File

Figure 2-12
1st Aid Kit is
Another Capable
File and Disk
Recovery Tool

An added bonus is that 1st Aid Kit is better than SUM at extracting text from damaged word processor or page layout files. This can be a lifesaver. Even though you lose the formatting, you won't have to retype the words. And 1st Aid Kit requires no advance preparation. It works fine even if you don't unwrap it until you have a need for it. You'd be missing out if you didn't at least glance through the 300-page manual, which is so detailed it could serve as a textbook for file and disk structure and recovery.

1st Aid Kit even comes with pre-crashed sample disks for the tutorial. Though SUM may provide more features, 1st Aid Kit does a better job of explaining what you're doing and why.

Programmer's Switch

Packed in the box with all Macintosh computers.

Disk First Aid
HD SC Setup

Part of Apple System Software. (See the Recommendations section in Chapter 1 for details on where to get it.)

DriveWare
>Jasmine Technologies, Inc.
>1740 Army Street
>San Francisco, CA 94124
>800–347–3228
>415–282–1111
>Various prices

DriveWare is the initialization software that comes with all Jasmine hard disks. It's elegant and as easy to use as any I've seen.

DiskExpress
>ALSoft
>P.O. Box 927
>Spring, TX 77383
>713–353–4090
>Approximately $70
>Lisa/XL, 512K, 512Ke, Plus, SE, II, IIx, SE/30

The finest disk optimizer around. See the next chapter for information about why you should optimize your disks.

DiskTop
>CE Software
>P.O. Box 65580
>West Des Moines, IA 50265
>515–224–1995
>Approximately $50
>512Ke, Plus, SE, II, IIx, SE/30

I'll only say it a few more times in the book, I promise. But DiskTop *really is* the greatest utility ever invented.

Aask

> (Part of the MockPackage Plus Utilities package)
> CE Software
> P.O. Box 65580
> West Des Moines, IA 50265
> 515–224–1995
> Approximately $50
> 512Ke, Plus, SE, II, IIx, SE/30

Aask alone is worth the price of the package as a whole if you have a lot of INITs to manage. MockPackage Plus Utilities offers much more though. In addition to Aask you get:

- MockChart—a capable DA for creating charts
- MockWrite—a text-editing DA
- MockTerminal—a DA that lets you telecommunicate
- MockPrinter—a spooler for ASCII text files
- Control-1—a CDEV that lets you choose what CDEV is on top of the scrolling list when the Control Panel is opened.
- EZ-Menu—an INIT that causes your menus to pull down when you place the mouse over them, even if you don't click.
- Widgets and LaserStatus—a potpourri of utility functions. (Widgets and LaserStatus are also included with DiskTop.)

There's not a bad one in the bunch. MockPackage Plus Utilities is worth buying for Aask or EZ-Menus, both of which I find invaluable. The other programs in the package are equally useful and polished, but of less use to me. You can't go wrong with this package: CE Software is known for their excellent work.

INIT Picker
> MicroSeeds
> 7030-B West Hillsborough Avenue
> Tampa, FL 33615
> 813–882–8635
> Approximately $40
> Plus, SE, II, IIx, SE/30
> Requires System 6.0 or later

Like Aask, INIT Picker lets you select the INITs you want turned on and off. Unlike Aask, INIT Picker allows you to change the loading order of INITs without renaming them. Another very slick utility if you use a lot of INITs.

Summary

A lot of the information in this chapter should be standard operating procedure to keep your hard disk running smoothly. It'll work on floppies too. Here's the regimen I follow:

I replace my System and Finder with the copies on my Disaster Disk once a month, whether they need it or not. I also rebuild the Desktop and optimize (defragment) with Disk Express (more on DiskExpress in the next chapter). I rarely have problems with my hard disks anymore, and they seem to run faster after this treatment. Try it. You'll like it.

If you're the least bit concerned about recovering files from a crashed disk, hard or floppy, get a copy of SUM or 1st Aid Kit as soon as possible. After a disk crash, these programs can mean the difference between recovery and failure. Both are priced under $100. (SUM is bundled with Jasmine hard disks.) One or both have saved my hide more than once. (I know, I'm supposed to back up every day.)

Even if you have a recovery program, try the techniques outlined in this chapter first:

1. Repair the disk with Disk First Aid.
2. Install new drivers.
3. Rebuild your Desktop.
4. Replace your hard disk's System and Finder.

5. Zap your PRAM/Check your Battery.
6. Resolve INIT conflicts.
7. If you have more than one SCSI device:
   a. Check your terminators.
   b. Resolve SCSI ID conflicts.
8. If your hard disk still won't mount, use SUM (Symantec Utilities for Macintosh) or 1st Aid Kit.

Don't forget to reboot between steps. None of these techniques is destructive, so they won't make things any worse. Best of all, they work fairly often. Be sure you've tried everything before you initialize your hard disk or resort to taking it in for service.

3

Understanding Hard Disks

What they do and how to get the most out of them.

There are at least 20 million reasons to own a hard disk. If you don't already own one, it's probably the first hardware investment you should make. There's nothing else that provides so much performance in those two all-important areas—speed and storage space—at so low a price. No more hunting for disks or files—everything you need each day is at your fingertips. And a hard disk is significantly faster than a floppy. A well-organized hard disk could save you as much as a half-hour a day, time you now spend looking at the little watch cursor or searching for floppies.

Another advantage is that you can have all the fonts and desk accessories your little heart desires. And, once you have a hard disk, there are dozens of utility programs (see Chapter 6) that make using it even faster and more convenient. One final advantage—you'll be able to use powerful software that requires a hard disk, such as PageMaker and HyperCard. (Okay, HyperCard doesn't require a hard disk. But it's all but useless without one.)

Once you've gotten used to a hard disk, working from floppy disks will seem archaic.

What Is a Hard Disk, and Why Do I Want One?

A hard disk is like a giant nonremovable disk that can hold over 20 million bytes. A 20-megabyte hard disk can hold everything you presently keep on twenty-five 800K floppy disks. It's a very fast disk, two or three times faster than floppies. Everything that requires disk access—saving, opening a document, and launching or quitting an application—is far faster when you're using a hard disk. Depending on your needs, you can buy hard disks in sizes ranging from 20 megabytes (20,000K) to more than 300 megabytes (300,000K).

A Little
History

Since the introduction of the Mac Plus, hard disks have connected to Macs via the SCSI port. (As I mentioned in the last chapter, SCSI stands for Small Computer Systems Interface and is pronounced "scuzzy.") But it wasn't always that way. Before the introduction of the Plus, hard disks connected through the far slower modem, printer or floppy disk ports. If you've still got one of these hard disks, or your Mac doesn't have a SCSI port, you've got a dinosaur on your hands. Upgrade as soon as possible. And, if you're buying a used Plus, don't be persuaded to buy an old non-SCSI Apple HD 20.

The SCSI
Chain (Bus)

The SCSI port allows high-speed data transfer to and from your Mac. If you look behind your Mac, the SCSI port is the largest connector—the long, narrow one with two rows of tiny connectors. The proper cable is usually supplied with the device. If not, an Apple dealer or a mail-order house such as MacConnection

will have them for about $25. If you need a cable, be sure to look at the back of your SCSI device and see if the connector is a 25-pin connector (like the one on the back of your Mac) or a 50-pin connector (larger and wider than the one on your Mac). SCSI device manufacturers generally use the 50-pin type, but there are still a few who use a 25-pin connector. Make sure you pick up the right cable—there's nothing more frustrating than having to make a second trip to the store.

The SCSI interface allows up to six devices to communicate with your Mac at high speed. You connect each device to the next and connect the last in the chain to your Mac. This is called a *SCSI chain*, and the devices connected to it are said to be connected to the *SCSI bus*. (In this case, bus refers to the hardware used to connect peripherals or other computers—the cables and connectors. Bus is also used to refer to hardware that transfers information between different components inside the computer, such as NuBus in the Mac II, IIx, and IIcx, and 030 Direct Slot in the SE/30.)

Other peripherals besides hard disks may use the SCSI bus to communicate with your Mac. High-speed scanners and tape or removable-media backup devices are other devices that may share the SCSI bus with your hard disk. All SCSI devices come with two SCSI connectors, which (unless your manual says otherwise) can be used interchangeably for data coming in and going out. You can connect up to six SCSI devices in a chain, in any order, and they'll all work. (The previous chapter has important information on termination and SCSI ID numbering. If you plan to hook up more than one SCSI device, you might want to reread those sections.)

Hard disks come in many shapes and sizes, ranging from twenty to hundreds of megabytes. Some sit under your Mac Plus or SE; others sit vertically alongside it. Still others are mounted inside your Mac, though internal drives are commonly available only for the SE, SE/30, II, IIx and IIcx.

(If you decide to install an internal drive in a Plus, be sure to purchase a fan as well. Hard disks run best if they're not allowed to get too hot. SE and II series Macs come with internal fans.) Some external drives have fans, and others cool themselves by convection (that is, vents near the bottom that allow cool air to enter and rise—the same cooling principle used in the 128, 512, and Plus.)

As you can see, there are many choices. But so far, the choices are mostly a matter of preference. Hard disks with fans are somewhat noisier than those without, but I trust fan-cooled drives a little more than those without. As far as the shape of the case, and horizontal versus vertical orientation, take a look at your desk space. If you have a one-piece Mac (that is, a 512, Plus, or SE) you might want a drive with "zero footprint"—one that sits perfectly beneath your Mac. If you have an SE or II series Mac, you may have an internal hard disk already. If not, you might want to consider one. The SE and II series were specifically designed to accommodate internal hard disks. Internal drives take up no desk space, can be taken with you if you have an SE or SE/30, and are somewhat less expensive than external drives. As you can see, the choices are mostly a matter of preference.

There are dozens of manufacturers of reliable hard disks, and wide differences in performance and prices.

How Hard Disks Work

Inside the
Box

Your hard disk contains a flat, round, metallic platter, which is either 5.25 or 3.5 inches in diameter. The platter is coated with a magnetic recording medium, not unlike the magnetic coating on audio or video tape. The platter is spun by a motor at a constant speed of about 3,600 revolutions per minute. A read/write head is suspended micro-inches away from the platter and is moved up and back, using instructions it receives from your computer, to read and write from the spinning platter. The read/write head acts like the record and playback heads of a video or audio cassette player, except that instead of passing the media over the head, hard disks move the head over the spinning media. Information is written and read from *tracks*, which are concentric circles of data evenly spaced across the surface on the platter.

Because the read/write heads fly next to the platter at a distance closer than the width of a human hair, the head and disk assembly are contained in a sealed casing to protect it against airborne contaminants and accidental jarring. Other components in a hard disk include a power supply, air filter, and SCSI controller board. Some hard disks also include external thumb wheel or dip switches for setting the SCSI ID; others perform these chores with software.

Thumb wheels for selecting SCSI ID numbers are almost always on the back of the drive. To select an ID number, just click the button repeatedly until the number you want appears in the window. If your drive uses dip switches, consult your owner's manual for instructions. Dip switches are the least convenient way of setting your ID number. Fortunately, it's not something you do very often, so if your drive uses dip switches, don't despair. Some drives (SuperMac, for example) allow you to set the SCSI ID number from the initialization software. This may be the easiest way of all.

Interleave

Interleave refers to the order in which the heads read and write the sectors on the hard disk. Most hard disks are capable of working at different interleave factors. When you initialize a hard disk, it selects the proper interleave factor for the Mac to which you're going to connect it. The formatting process creates concentric rings, called tracks. Each track is divided into sectors. Figure 3–1 shows how the platter inside your drive is divided into tracks and sectors when you initialize it.
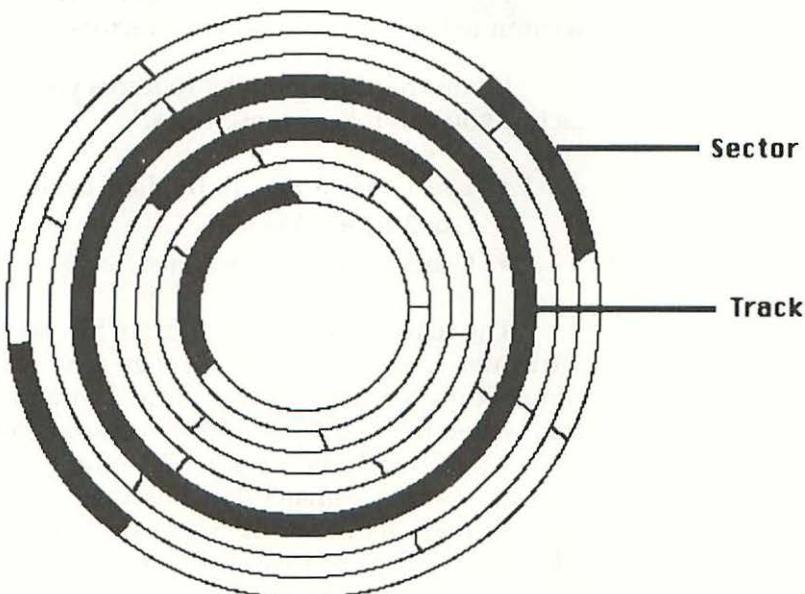

Sector

Track

Figure 3–1
Sectors and Tracks

Because each type of computer is capable of sending and receiving information through the SCSI port at different speeds (the Mac II is capable of about 1.25Kb/second, the Mac SE is capable of about 600Kb/second, and the Mac Plus is capable of about 300Kb/second), the interleave factor should be set to optimize the transfer between your computer and your hard disk. Some brands ask you to specify which interleave you want when you first initialize your hard disk. Others automatically select the proper interleave after you specify what model of Mac you're using. If the interleave on your hard disk is set to a non-optimized setting for your Mac, you may experience degraded performance.

Here's how interleave works. Imagine that each track on your hard disk's platter is divided into 7 sectors:

- A 1:1 interleave will write to/read from each sector in order, taking one revolution to read the entire track.
- A 2:1 interleave will write to/read from every other sector, taking two revolutions to read the entire track.
- A 3:1 interleave will write to/read from every third sector, taking three revolutions to read the entire track.

Figure 3–2 illustrates the order in which tracks are read and written using various interleave factors.

If your hard disk model requires you to select an interleave factor, you can follow these rules:

- Use 1:1 for a Mac II, IIx, IIcx, or SE/30
- Use 2:1 for a Mac SE
- Use 3:1 for all other Macs

The reason a Mac II, IIx, IIcx, or SE/30 can utilize disks with a 1:1 interleave is that, because they're very fast computers, they can process the data in a sector as fast as the drive can read it, even when the disk reads every sector in consecutive order.

An SE works best with a 2:1 interleave because its processor requires approximately twice as much time as a Mac II to process the information in a sector. So the drive reads every other sector, allowing the SE's processor time to catch up.

1:1 Interleave

2:1 Interleave
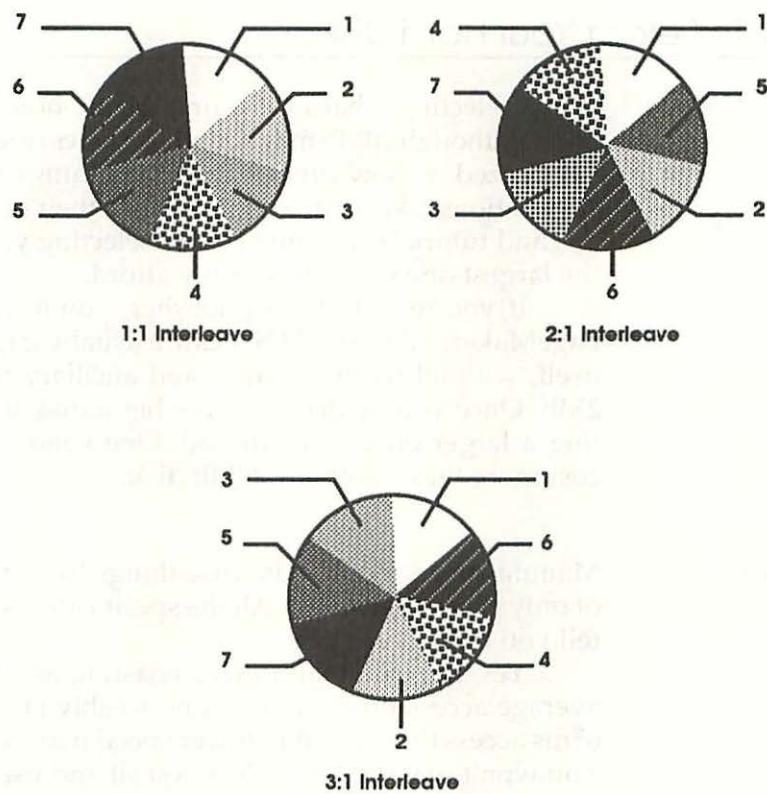
3:1 Interleave

Figure 3–2
The Effect of
Various Interleave
Factors

Plus and 512KE owners should use an interleave of 3:1; your computer processes information even more slowly.

Using a drive formatted with the wrong interleave factor for your Mac will degrade performance. For example, if you use a drive formatted at a 3:1 interleave factor on a Mac II, your computer will have to wait as two out of three sectors pass under the head. It works the other way too—if you try using a drive with a 1:1 interleave on an SE it will be slower than a 2:1 drive. The bottom line is that you should confirm that your hard disk is formatted using the proper interleave factor for the your Mac. If your drive came formatted, or you're not sure what interleave you used when you first formatted the disk, call the manufacturer.

How To Select Your Hard Disk

Size

When selecting a hard disk, first decide how much storage you need. Although 20Mb may sound like acres of storage space, you'll be amazed at how quickly you find things to fill it up. Many applications take up at least 1Mb with their associated files, folders, and tutorials. The first rule of selecting your hard disk is get the largest one you can possibly afford.

If you're a desktop publisher, you'll need at least 40Mb. PageMaker, TIFF, and EPS files are usually large, and PageMaker itself, with all its dictionaries and ancillary files, takes up over 2Mb. Once you've decided how big a disk to get, consider getting a larger one. Shop around. One vendor's 60Mb disk may cost more than another's 80Mb disk.

Speed

Manufacturers like to advertise things like "average access time of only 25 milliseconds." All the specifications in the world won't tell you the whole story.

Yes, it's true that a drive boasting an 18-millisecond (ms) average access time will work noticeably faster than one with a 65ms access time. But the slower speed may be all right with you. You won't really know unless you sit and use both.

Access time is only one measure of a hard disk's speed. It tells how long it takes the drive to locate a particular track. Other benchmarks you may see bandied about include DiskTimer II, SCSI Evaluator, seek, settle, and latency. Don't worry about them. You can compare them to get an idea of how one disk compares to another, but for most people, the difference between two drives with similar specifications is unnoticeable. Occasionally magazines use tests such as how fast a 600K PageMaker file opens and loads, how fast a multimegabyte database opens, and how long it takes to duplicate a file in the Finder. I find these better indicators than the benchmarks. Although none of these tests prove anything absolutely, most of them are good indicators of how fast a drive will "feel" to you.

How important is speed, anyway? Let's put it this way: I love the responsiveness of an 18ms (average access time) drive. That's because I'm particularly sensitive to the speed of my hard disk. Others in my office don't notice much difference between a 40ms and a 25ms drive. A faster drive may not be worth the extra cost to you. In many cases, you'll have to decide between a bigger drive and a faster drive. I think, in most cases, you'll be happier with the bigger one. Remember—the faster the drive, the more expensive it will be. For most people, small differences in speed from one drive to another are almost imperceptible. The exception is the Mac II, which has a faster processor and begs for a fast hard disk. If you're lucky enough to have a Mac II, get the fastest hard disk you can.

In evaluating hard disk speed, the best thing to do would be to go to a dealer and try out a number of different drives with different specifications. If that's not possible, see if you can get friends with hard disks to let you try theirs and compare the differences. Or check with your local user group; perhaps they know of a place where you can test more than one drive.

Bundled Software

Finally, the price of your hard disk will usually include some bundled software. *Bundled software* is a set of working versions of commercially available software, usually utilities, which are included on your hard disk at no additional cost. Bundled software usually includes some sort of documentation. Inquire about it; if you need the software, bundled software lowers the effective price you pay for the drive.

Remember, you're going to want certain utilities once you have a hard disk. Bundles often include such needed items as backup utilities, partitioning utilities, encryption or password protection utilities, disk recovery tools, or print spoolers.

Before making a purchase decision, think not only about the software you need today but also about the software you'll need in the future. Be sure to factor in the cost of these utilities if you select a drive with no bundled software.

Choosing a Brand

There are many good manufacturers of hard disks. Some, like SuperMac, Apple, and Rodime, are available only through authorized dealers. Others, like Jasmine, are available almost exclusively by mail order. Buying from a dealer may have advantages if your drive breaks, depending on the quality of your dealer's service department.

Jasmine uses a "direct marketing" approach to selling hardware: Jasmine products are available only direct from Jasmine. This cuts out the middleman (the dealer) and lets Jasmine provide incredible values. And their products are excellent.

Ordinarily, I hesitate to recommend a major purchase by mail order, but Jasmine has been around for a while and has a well-deserved reputation for quality. Not to mention a great line of products, the best software bundle in the business, and excellent (well-written, easy-to-understand, lavishly illustrated) manuals and friendly, knowledgeable technical support staff. All in all, it's a pleasure to work with Jasmine.

If your Jasmine product breaks, you return it to the company (using Federal Express if you like) and they repair or replace it, usually within a couple of days. And, they'll do their best to recover your data, if at all possible. If the product is still under warranty, they'll even pay the freight both ways.

One word of caution: Apple drives are slower and higher priced than their counterparts from independent producers. In addition, the Apple warranty of 90 days is shorter than almost everyone else in the business. Jasmine and SuperMac both offer one-year warranties, and Microtech offers a five-year warranty. In any case, think long and hard before investing in an Apple-labeled hard disk.

Shop around. Compare sizes, speed, price, and bundled software, and consider whether you need local service or if buying by mail from Jasmine is acceptable to you.

Organizing Your Hard Disk

Different people organize their hard disk different ways. There is no "right" way to do it. The Macintosh allows you to decide what combination of folders makes sense to you.

Some people are highly organized, and keep all their files and folders in a strict order. They might also carefully arrange their Desktops, with windows overlapping in a neat, tiled manner. My friend Jerry is like that. As you can see in Figure 3–3, he must spend hours making sure those windows open just right. Interestingly, his physical desk looks like a tornado hit it—papers, books, disks, and hardware devices are tossed haphazardly about the desktop.
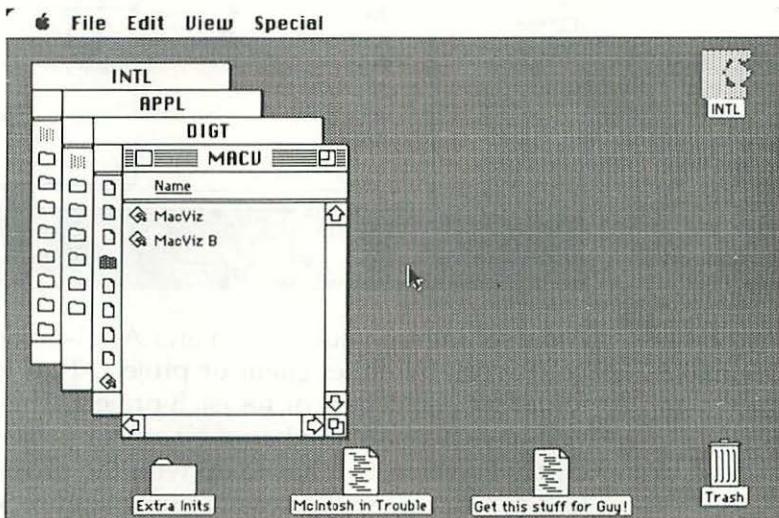

Figure 3–3
Jerry's Well-
Organized Desktop

I, on the other hand, keep a reasonably neat office but have a messy hard disk, as you can see in Figure 3–4. I like to put frequently used icons right on the desktop, and I use a variety of views: big icons (databases), small icons (applications), and by date (correspondence). The windows' placement is a function of where I last dragged them.

I recommend several general strategies for organizing your hard disk. In each of the strategies, some things are constant. For example, no matter how you decide to organize your hard disk, frequently used icons should be stored on the gray desktop. And I like to put all applications in their own folder, which I name "Applications."
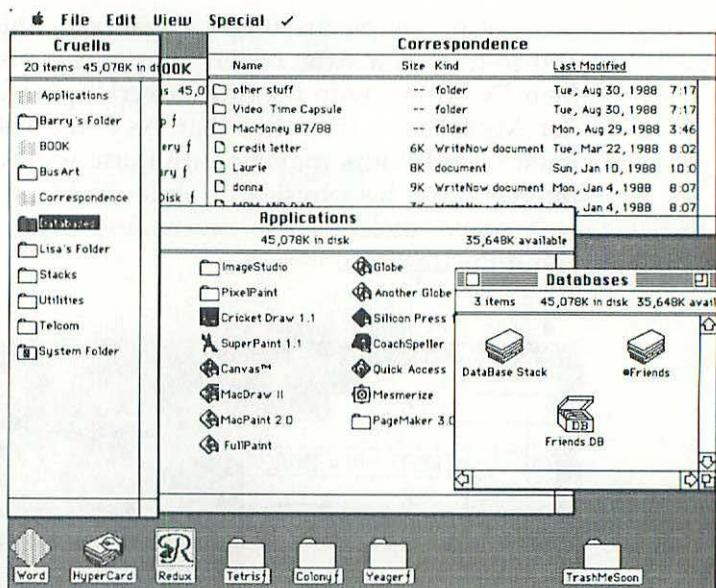
Figure 3-4
My Disorganized
Desktop

**Strategy 1—
by Client/
Project**

After setting up your System and Applications folders, organize your work by either client or project. That is, set up a separate folder for each client or for each project. This is workable only if you have a small number of clients or projects. Its advantage is that everything that has to do with the project or client is in one folder, where it will be easy to find (Figure 3-5). If a client calls, or your boss asks about a specific project, you'll be able to find all of the files in a single folder.
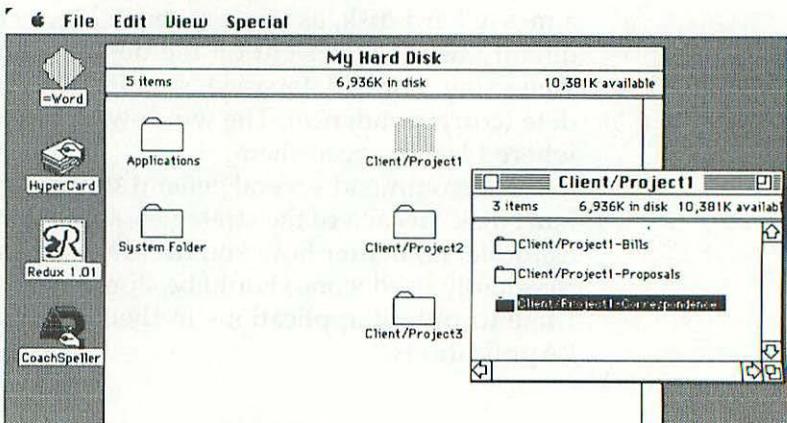

Figure 3-5
Hard Disk Organized
by Client/Project

Strategy 2—
Organizing
by Task

Another way to organize your hard disk is by task. Documents of the same type go into their own folders. Create one for memos, another for letters, another for proposals, and so on (Figure 3–6). The advantage here is that if you need to find any letter, regardless of its addressee or purpose, you know it's stored in your "Letters" folder.
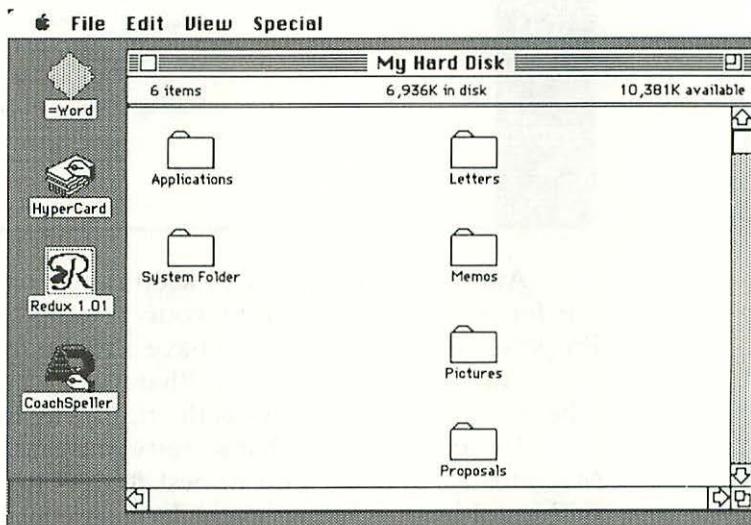

Figure 3–6
Hard Disk
Organized by Task

Strategy 3—
Organizing by
Application

Some people prefer to organize their files and folders by the application that created the documents. So you'd have a Word folder that contained the Microsoft Word application, all of its associated files (dictionaries, glossary, help file, etc.), and folders containing all of the documents created by Word (Figure 3–7). Your folder for Illustrator '88 (a graphics program) might contain the application plus folders for logos, drawings, ads, etc.

Taking this strategy one step further, I know people who keep all similar applications in the same folder, with all documents created by those applications. So the Graphics folder might contain SuperPaint, Canvas and Illustrator, plus folders for logos, scanned images, clip art, etc.

Of course, there are dozens of ways to organize your hard disk. You may want to set up a combination of more than one way. For example, you could create a folder for each client, then create folders within it for letters, memos, proposals, etc.
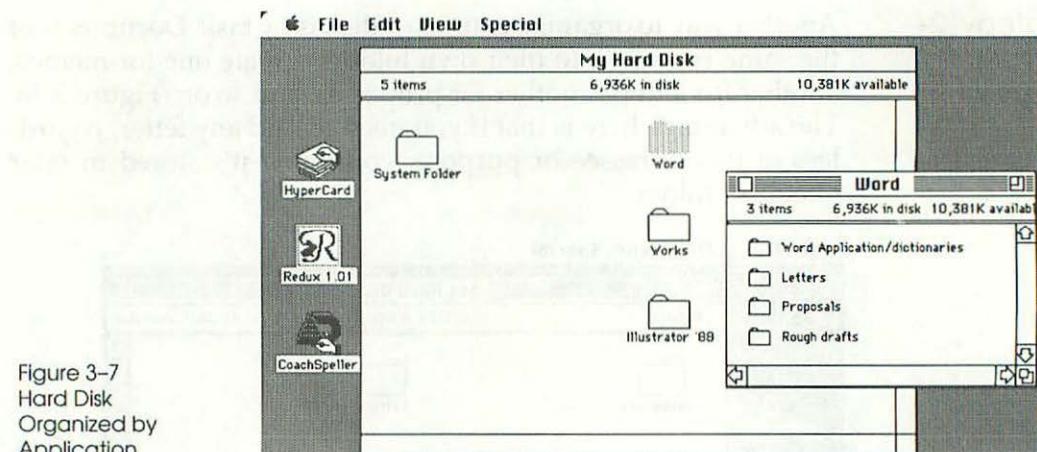
Figure 3-7
Hard Disk
Organized by
Application

Another popular way to keep things organized is to use a file for each month. Within your Letters, Client/Project, and Proposals folders, you would have a folder for each month.

There's no "right" way. Whatever helps you keep track of where you've stored things is the right way for you.

There is one thing that's pretty universal—even though the Macintosh will allow you to nest folders (that is, place folders within folders) as many levels deep as you like, try not to nest files or folders more than four levels deep. Having to open four or more folders—as you would have to do before you could open a document or folder inside any of the level-4 folders in Figure 3-8—is inconvenient.

As I mentioned earlier, whatever method you use to organize your hard disk, I recommend that you try putting frequently used icons on the gray desktop. You can see in Figure 3-8 that I keep my frequently used applications—Word, PageMaker, and HyperCard—right on the gray desktop area (or, as in this illustration, the patterned desktop area which I created using the Control Panel DA). Here they're easy to find and launch.

Finally, if folders aren't your cup of tea, utilities like Power-Station, OnCue, and MasterJuggler offer an alternate method of organizing and accessing files and folders that some power users prefer. There are many utilities for avoiding the Finder and folders. The best are included in Chapter 6.
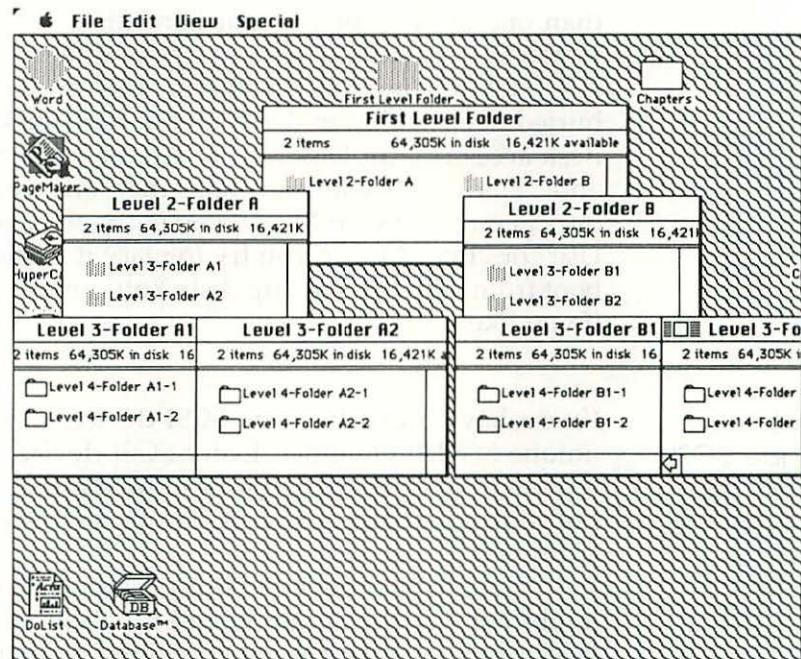
Figure 3–8
Folders Nested
Four Levels Deep

Hard Disk Hints and Tips

Choose a
Sturdy
Surface for
Your Hard
Disk

If your hard disk is an external model, make sure it is placed on a sturdy surface. If you have an internal hard disk, make sure your Mac itself sits on a sturdy surface. Vibration and shocks can cause the hard disk's head to crash into the spinning media. You don't want to keep your hard disk (or your Mac, especially one with an internal hard disk) in a place where it's likely to be jarred or bumped.

Have One
System and
Finder per
Hard Disk

Never have more than one System Folder on a hard disk. This is very important. When you copy applications from the master disk to your hard disk, be careful not to copy the System Folder as well as with the application. Having two or more Systems on a hard disk will cause unpredictable behavior and crashes. Menus may become scrambled, and DAs and INITs will sometimes disappear. That's because you've installed them (or opened them with a utility like Suitcase II or MasterJuggler) in *your* System file, and now there's another one on the hard disk. If there's more

than one System file on your hard disk, your Mac won't know which System should be in charge of things.

If you're not sure whether there's an extra System or Finder buried deep within folders on your hard disk, use the Find File desk accessory (or DiskTop) to search for files named "System" and "Finder." If you find more than one, remove all the extra ones and restart your Mac. If you get a message that the file is "In Use" or "Busy" when you try to place it in the trash, restart and boot from a floppy start-up disk. You can use your Disaster Disk if you like.

Have a Unique SCSI ID for Each SCSI Device

If you have more than one SCSI device, make sure each has a unique SCSI ID number. Every SCSI device has one, and most will allow you to change it. See the manual for your device to find out how to set its SCSI ID (it may also be called a "SCSI address").

Having two devices with the same ID on the SCSI chain might not damage anything, but it will prevent one or both devices from working. (See the previous chapter for more on SCSI IDs and conflicts.)

Terminate Your SCSI Chain If Necessary

If you have more than one SCSI device connected, make sure your SCSI chain is properly terminated.

Check your owner's manual to find out if your device is internally terminated. External terminators are available from your local Apple dealer. (Again, the previous chapter has a detailed discussion of SCSI termination.)

Rebuild your Desktop Periodically

The Macintosh stores an invisible file, called the Desktop, on every disk. I consider it routine maintenance to rebuild my Desktop at least once a month. Complete instructions for rebuilding your desktop can be found in the previous chapter.

Use a Disk Optimizer

Your Macintosh stores your files in pieces on your hard disk. It writes files to any available space on your hard disk, even if that space is not contiguous. As more files are written, different parts

of each file are stored in different places on the drive. The drive takes longer to read a file that is written in several places because it has to move its read/write head further.

The best optimizer around is DiskExpress. If you're serious about performance, you need to optimize your hard disk periodically, and DiskExpress is the only product that does a thorough job of it. Other products rearrange the files on your hard disk and reduce fragmentation some, but only DiskExpress can prioritize as it optimizes. It's smart enough to write System files, applications, and programming tools to the beginning of the volume, where access will be faster.

DiskExpress takes all of the pieces of every file on your hard disk and rewrites them in contiguous order. As a result, your hard disk will run faster, because the amount of head movement has been reduced by putting files back down in one place.

DiskExpress can also compute the extent of fragmentation on your hard disk (that is, what percent of your files are written to noncontiguous disk space), examine disks for media damage, compact the desktop (a fancy way to rebuild the Desktop without deleting the Get Info comments), and erase unused space. You can even instruct it to erase unused space three times, for maximum security. Another bonus is that DiskExpress can repair a damaged disk directory. Because there's no sure way to tell when you've sustained directory damage, running DiskExpress periodically is good preventive maintenance. Without it, by the time you realize a disk directory is damaged, the disk has usually crashed or has begun acting strange.

Important Warning: Never run DiskExpress unless you have a complete backup of the hard disk you're about to optimize. If the power is interrupted or the Mac is reset while DiskExpress is running, the data on your hard disk is likely to be damaged.

Always Turn Off the Mac Properly

Never just reach over and shut off the power on your Mac or peripherals, and never push the reset button on the programmer's switch unless you're hopelessly crashed.

If you want to reboot, use the Restart command in the Finder's Special menu (Figure 3–9). When you want to turn your Mac off,

use the Shut Down command, then wait for the alert that tells you it's okay to turn off your Macintosh. Next, turn off your Mac, and then turn off your hard disk if you have an external model. Internal models will power down automatically when you use the Shut Down command.

Figure 3-9
Always Use Shut
Down and Restart

If you just reach over and turn your hard disk or Mac off without using the Restart or Shut Down commands, you run the risk of damaging your directory or Desktop file. Always use Shut Down before turning off a hard disk.

Mac II users will have little trouble adapting to this: the power-off switch is inconveniently located on the back of the CPU, whereas the power-on switch is on the keyboard.

Turn Off the Power Before You Plug or Unplug Cables

Turn off everything before connecting SCSI cables. This is actually a good idea when connecting *any* type of cable: printer, modem, AppleTalk, mouse, or keyboard. It is possible to do serious damage (such as frying an electrical component or chip) to both your Mac and your peripheral devices if you plug and unplug them with something turned on. If you have more than one SCSI device on the chain, make sure *all* of them are turned off before changing any SCSI connections.

Park the Heads Before Moving Your Hard Disk

Before you move your hard disk, make sure its heads are parked. Parking the heads of a hard disk locks the heads in an area far from the media, providing additional insurance that the heads are not coming into contact with the platter. Many brands of hard disk, such as Apple's internal drives, automatically park the heads

when you do a Shut Down; others provide software for parking them. Check your manual for details, but no matter what, make sure your heads are parked before moving your hard disk.

Recommendations

The hard disks I recommend, as well as software for disk management and other products, are listed below.

Hard Drive Manufacturers

There are dozens of manufacturers of hard drives. Many manufacturers include bundles of software that range from nothing more than initialization software to a wide range of valuable programs.

Don't take what you read here as gospel. The hard disk manufacturers are always adding products to their bundles, trying to squeeze out a competitive advantage. Before you decide on a hard disk, ask about bundled software—it can add several hundred dollars in value to your purchase at little or no additional cost to you.

Jasmine

Jasmine Technologies, Inc.
1740 Army Street
San Francisco, CA 94124
800–347–3228
415–282–1111
Various sizes and prices

Jasmine has a broad line of quality mass storage products at aggressively competitive prices. They also have, in my opinion, the finest bundle of added software, worth at least a couple of hundred dollars. It includes Redux (backup utility), SUM (disk recovery utility), 10Mb of shareware and 5Mb of commercial product demos. Also included is DriveWare, the initialization software that comes with all Jasmine hard disks. It's elegant and as easy to use as any I know.

Unless you insist on local dealer support, consider Jasmine products, which are available only direct from Jasmine.

SuperMac Technology
485 Potrero Avenue
Sunnyvale, CA 94086
408–245–2202
Various sizes and prices

SuperMac makes storage and video display systems. In the storage market the company is known for extremely fast drives. Their line is made up almost exclusively of drives that are as fast as or faster than most others in their size class. They provide a valuable bundle that includes DiskFit (backup utility), SuperSpool and SuperLaserSpool (print spoolers for ImageWriters and LaserWriters), plus partitioning and password utilities.

SuperMac drives are available primarily through dealers and cannot be purchased direct.

Micronet Technology, Inc.
13765-A Alton Parkway
Irvine, CA 92718
714–837–6033
Various sizes and prices

Micronet is a smaller company that specializes in high performance hardware. They quickly established a reputation as one of the best and highest-quality suppliers. That's not surprising—Micronet is one of very few Macintosh-only developers around (Jasmine is another Mac-only developer). Micronet's president, Charles McConathy, has acquired an excellent reputation among power users for being knowledgeable and pricing his products fairly.

Formatter, partitioning software, and SCSI Evaluator (shareware) are bundled with Micronet drives.

Rodime
901 Broken Sound Parkway
Boca Raton, FL 33431
407–994–6200
Various sizes and prices

Rodime is another well-known manufacturer of hard disks. They bundle FastBack and a formatting/partitioning utility with their drives.

Microtech International, Inc.
    29 Business Park Drive
    Branford, CT 06405
    800–626–4276
    Various sizes and prices

Microtech makes a complete line of storage devices. They are best known, perhaps, for their unconventional five-year warranty. Microtech is also a good source for memory upgrades; their prices are reasonable, and they often have SIMMs in stock when others are back-ordered.

Their software bundle includes MacTree disk management software and DS Backup, a no-frills backup utility.

Apple Computer, Inc.
    20525 Mariani Ave.
    Cupertino, CA 95014
    408–996–1010
    Various sizes and prices

Apple drives are overpriced, slower, and have shorter warranties than almost any other drive, and their bundled software is minimal at best. About the only thing they have going for them is that they are usually reliable. Because of the price, speed and warranty differences between Apple and everyone else, I don't recommend Apple drives. Almost any other brand will prove to be a better choice.

Mail-order
Companies

MacConnection
    14 Mill Street
    Marlow, NH 03456
    800–622–5472
    Mail-order discount software and hardware. Mac only.

One of the best resources for hardware and software. Offers overnight delivery of most products for $3. Good source for cables and accessories.

Hard Disk Management Software

DiskTimer II, SCSI Evaluator

Two shareware applications, available from user groups or on-line services, that measure hard disk performance. SCSI Evaluator has more complete tests; DiskTimer II is easier to use and understand.

PowerStation
Fifth Generation Systems
11200 Industriplex Boulevard
Baton Rouge, LA 70809
504–291–7221
Approximately $60
512Ke, Plus, SE, II, IIx, SE/30
Requires System 4.1 or later

A Finder replacement. Avoids using folders and speeds access to frequently used applications and documents. A more complete description of PowerStation appears in Chapter 6.

DiskExpress
ALSoft
P.O. Box 927
Spring, TX 77383
713–353–4090
Approximately $70
Lisa/XL, 512K, 512Ke, Plus, SE, II, IIx, SE/30

The best disk optimizer around. Easily worth the price, if you care about keeping your drives in top shape and coaxing the maximum performance out of them.

OnCue
Icom Simulations
648 S. Wheeling Road
Wheeling, IL 60090
312–520–4440
Approximately $60
512K, 512Ke, Plus, SE, II, IIx, SE/30

OnCue is a file-launching utility that provides an excellent, intuitive and fast way to launch programs (and switch between them under MultiFinder).

Summary

A hard disk provides impressive performance improvements and makes life with your Macintosh a lot more convenient. A hard disk will reduce the amount of time you waste each day. There's little question—if you don't already have a hard disk, you want one. If you've never used a Mac with a SCSI hard disk, go out and try one. You won't believe your eyes.

Get the biggest drive you can. You'll be surprised at how quickly you fill up 20Mb. Other things to consider are speed, bundled software, price, and support.

Once you have your drive unpacked and set up, organize it in a way that makes sense to you and that complements the way you do your work.

Finally, keep your drive healthy. Use the Shut Down and Restart commands, don't plug or unplug cables while the power is on, rebuild your Desktop occasionally, and use DiskExpress to keep your hard disk running its best.

4

Protecting Your Work

Everything you need to know about backing up.

Computer equipment, particularly disks and whatever is on them, can fail. Floppy disks ask to be initialized even when you know there is data on them. Hard disks refuse to display their icons in the Finder, or crash every time you boot from them. Even the Mac itself can fail. (Actually, the Mac is pretty reliable, with the exception of the power supply on early Pluses and moving parts like disk drives.) I'd say that most computer equipment is 99-percent reliable. Unfortunately, when it breaks, it's always at the most inopportune and unexpected time.

Which is why backing up was invented. Computers (and hard disks) follow their own kind of Murphy's law—they fail only when you're up against a deadline. Backing up your work protects you from most disasters. You wouldn't drive without insurance, would you?

This chapter will tell you everything you need to know to insure that your files and disks are safe, no matter what catastrophe should strike.

Why Back Up?

Picture this: You've slaved for days on a project. It's 9:00 in the morning and you're scheduled to present your work in the conference room at 10:00. It's the best thing you've ever done and you're feeling pretty good as you get ready to print the final draft. You've saved often. Your masterpiece is secure on your hard disk.

All of a sudden, the office lights flicker, then go out for a moment. When the power returns, you hear a comforting "ding" as your Mac comes back to life. You breathe a sigh of relief, but then your heart drops as you stare at the flashing question mark. Your Mac can't tell there's a hard disk attached!

After a deep breath, you shut everything off and then restart (allowing the hard disk a few seconds to spin up). You cross your fingers as you power up your Mac. Your palms begin to sweat. You haven't backed up in days, and it's now 9:20.

A backup is insurance for your files. If you had backed up your hard disk, you would stride confidently into your presentation. Without a backup—I shudder at the thought.

Backing up can be as simple as copying important files from one disk (hard or floppy) to another in the Finder (or with Disk-Top). This is the easiest and least expensive way to protect your work. Unfortunately, it relies on your remembering to do it, and on your knowing which files need to be backed up. That's a lot to ask, especially if you have a hard disk.

If you're working with floppy disks, the easiest way to back up your work is to end each work session by making a copy of each floppy with data on it. If you want to be really safe, make two copies of anything vital.

Backing up floppies is a breeze, but backing up a hard disk can be a chore. A large-capacity hard disk may contain thousands of files and folders. Luckily, there are utility programs, described later in this chapter, that are designed to handle backing up a hard disk with style and grace. With a good backup utility you can insure that your files are safe and secure in less than ten minutes a day.

Remember, there are only two kinds of computer users: those who *have* lost data in a crash, and those who *will* lose data in a crash. (I know, I said it in Chapter 2. It's that important.) Fortunately, losing data in a crash is almost painless if you have a recent backup. Let's now examine the various strategies, software, and hardware available for keeping your work safe and secure.

Backup Strategies

What is the best backup strategy for you? Only you can answer that question. Even if you can't afford a hardware backup device, you must back up your work. To floppies.

Though there are ways to recover files from crashed hard disks (see Chapter 2), they take time. And they don't always work. I recently spent four hours attempting (unsuccessfully, I might add) to recover one very important file from a crashed hard disk that hadn't been backed up in several days. A lesson was learned— I back up my hard disk every night before I leave the office. I suppose if I were really conscientious I would back up twice and take one of the sets home with me.

Storing a backup set off-site isn't a bad idea. If there were a fire or burglary, could your business survive without the contents of your hard disk? Is every copy of your customer list stored in the same room? Some security-conscious firms require backups to be sent off-site every 12 hours, to be stored in fireproof, bombproof vaults. That may be overkill for you, but you should at least consider storing a set of backups in another location.

The sections that follow provide some specific backup strategies to use, depending on your hardware and software configuration.

What To Do If You Don't Have Special Backup Software

If you don't have special backup software of some type, I sincerely hope you're not using a hard disk. That's because if you use a hard disk, and if you modify more than a few files a day, you'll have trouble keeping track of which files you've changed and which files need to be backed up. The easiest solution is to consider special software (described later in the chapter) designed to back up your work.

If you work only from floppies or don't change many files on your hard disk, here's a regimen you can use:

At the end of every work session, copy everything you've modified to a backup floppy disk or disks. If you're using two floppy drives, just copy any documents from your work disk to a freshly initialized disk in your other drive at the end of each session. Call this your backup disk. If you have a hard disk, copy all of the files you've modified to a floppy disk or disks.

If you're going to use this method, it's best to create specific folders for work you want backed up. As Figure 4–1 shows, I've got two folders that I back up daily: Book and BackMeUpStuff. I've backed them up without using any special software by copying them from the hard disk named Cruella to the floppy disk named BookBackup2.
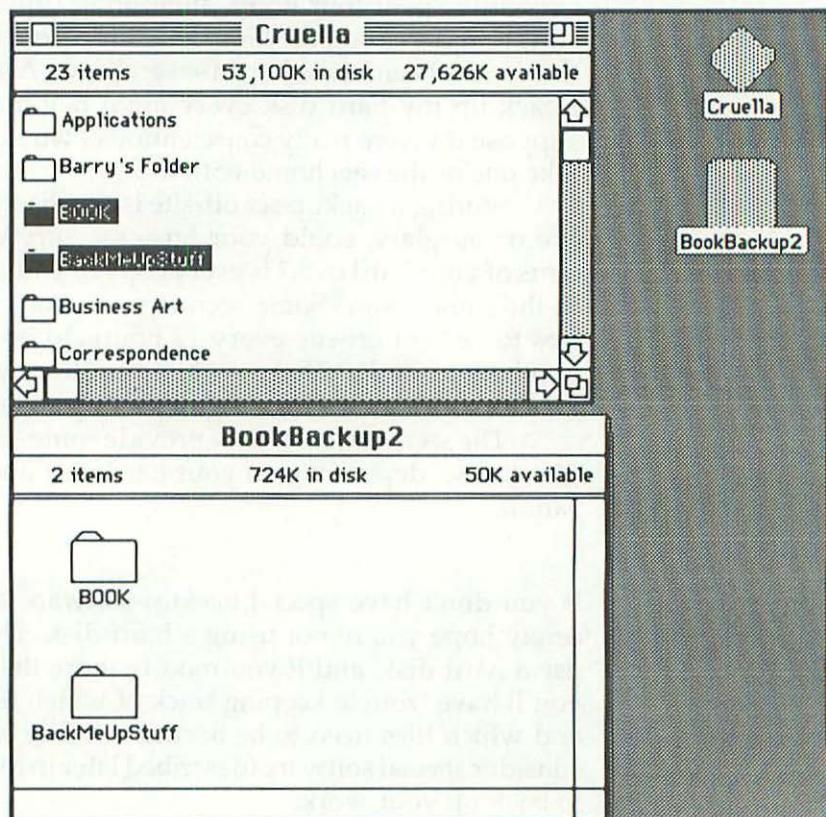

Figure 4–1
Folders Backed Up
to Floppy by
Dragging

If you have more files than will fit on a single floppy, initialize as many as you need to back up all of your changed files. The key to success using this strategy is to be sure there are two copies of anything important at the end of each work session—one on your work disk or hard disk and another on a backup disk. That way when an important file becomes damaged, erased, or inaccessible for whatever reason, you calmly reach for your backup copy and continue working.

I caution you: this strategy will work only if you're diligent about it. If that seems inconvenient, or like too much work, read on. You're a prime candidate for a backup utility that can automate the entire process.

What To Do If You Have a Backup Utility Program

If you have a backup utility program (that is, an application designed to assist you in backing up disks—several are discussed later in this chapter), you can use more sophisticated backup strategies. Here are three that provide various degrees of protection for the contents of your hard disk.

Strategy 1—Maximum Safety and Convenience Start by performing a complete backup with whatever backup software you've selected. On a 20Mb hard disk this should take under an hour providing you've initialized all the floppies you'll need first. Next, once a day, do an incremental backup of the entire hard disk—that is, back up files that have been modified since the last backup. All backup utilities perform complete and incremental backups automatically. Unless you've made a lot of changes to the files on your hard disk, an incremental backup shouldn't take more than 10 minutes a day. Believe me, it's time well spent.

For maximum protection, alternate between two sets of floppies, always keeping one set off-site. That way, if your office is destroyed by a fire, flood, or other disaster, you'll have everything you need to start working again immediately. Although you'll probably need a new Mac and hard disk, without an off-site backup, not only would you need new hardware, but you would have to re-create everything on your hard disk from scratch. Not fun.

This strategy is the safest because, if your hard disk is damaged in any way, you have two complete backup sets—applications, System files, and documents—that you can use until your main disk is up and running. The chance of your not having a copy of something in one of the two backup sets is remote as long as you remember to perform your incremental backup each day.

You can color-code the sets and back up to a different set each night. Colored labels are available at most computer or office supply stores. The older set should always be taken off-site at night. That way, if your office is destroyed, you have a complete copy of your hard disk that's no older than one day.

This strategy will take longer than the others, but it insures that, whatever happens, you have a backup set that's a snapshot (no more than one day old) of your hard disk's contents.

A variation of this strategy is to follow the same regimen but keep only a single backup set. If you elect not to use two backup sets, you might consider taking your backup set with you when you leave the office. Obviously, your level of security is reduced if you keep only one backup set.

Strategy 2—High Safety, Less-Convenient Crash Recovery This strategy takes less time than the first—it can reduce the time required to make incremental backups by as much as 50 percent. Using your backup software, create one backup set of System and Application files only. Then create another backup set and include only documents. To keep both sets current, perform an incremental backup of documents every day and backup System and application files every week or two.

This strategy will save time, because backup programs decide what to include in an incremental backup based on when the file was last modified. Sometimes applications and System files appear to your backup software as having been modified even if all you did was *use* them. That's because the information in your invisible Desktop file, which is what the backup utility uses to decide which files it should back up, reflects a modification date that is later than the date of your last incremental backup. So they may not really have *changed*, even though your backup software thinks they have.

The reason you can get away with backing up System and application files less frequently is that you *should* have copies of your application and System files on the master disks you keep on your shelf, or better still, in a safe place off-site. If you had to, you could always restore applications or System files from the master disks. Just remember, if you've made any modifications to your System or applications (such as adding fonts or DAs in your System file with Font/DA Mover) and you have to restore the System or applications from the master disks, you'll lose the modifications you made.

Although not as secure as strategy 1, this strategy makes sure the irreplaceable files, your documents, are backed up daily. For added security you could create two backup sets of each kind—two sets of application and System files and two sets of documents—rotating and storing one set off-site as in strategy 1. You could then rotate the System and application sets off-site once a month and rotate the document sets daily.

Strategy 3—Better Than No Backup Set your backup software to include only documents. (Most backup programs allow this.) Do a complete backup to floppies, then do incremental backups as often as you feel like it.

This strategy assumes that you have copies of System files and applications somewhere on the master disks. Again, if you've made modifications to your System or applications, you'll lose them if you have to restore from your master disks. But at least you'll have all your documents as of the last time you backed up. And that's better than losing everything.

Whatever strategy you adopt, you must back up your work Though hard disks are, for the most part, reliable beasts, they always choose the worst possible moment to die. And although a hard disk can usually be repaired or recovered, that could take hours. Or days. Trust me: someday it will happen to you. Backing up your hard disk is like dental hygiene—you should feel guilty when you forget it.

Now, let's take a look at some of the hardware and software products that make the bothersome-but-essential task of backing up somewhat less painful.

Backup Software

There are many disk backup utilities available. If you own a hard disk and keep anything of any importance on it, you need one. Luckily, most hard drives include (bundle) one. Jasmine bundles Redux, SuperMac bundles DiskFit, and Apple System Software releases include HD Backup. So, if you own a hard disk, chances are you've already got a backup utility.

If you don't want to spend any additional money, go ahead and use the utility that came with your drive. None of them—even the generic ones that come with off-brand hard disks—is truly horrible. Some are just better than others.

All backup software will back up files that have been changed (modified) since the last backup whenever you perform an incremental backup to floppy disks. Backup programs figure this out by checking the last time each file on your hard disk was modified. (If you want to know the last time a file was modified, select the file in the Finder and use the File menu's "Get Info" or its keyboard shortcut, Command-I. The date and time of the last modification will appear as shown in Figure 4–2.)
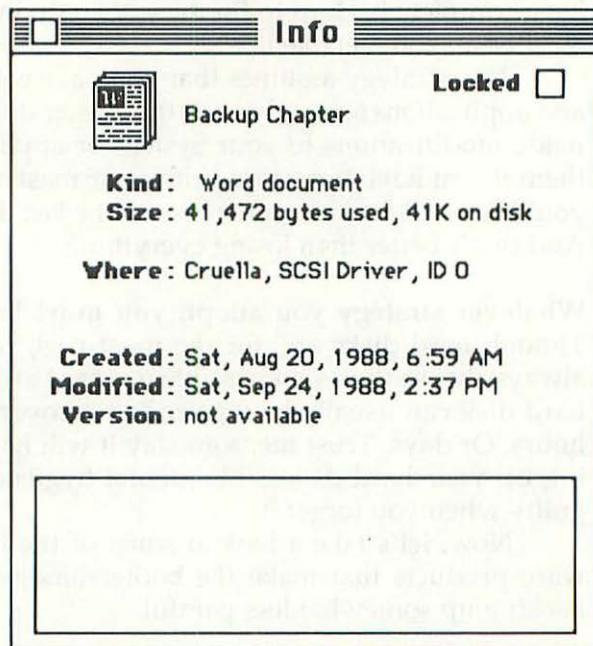

Figure 4–2
A Get Info Box

A few features are common to every backup program. All of them will easily perform:

- a complete backup
- an incremental backup
- a backup of selected files
- a complete restore
- a restore of selected files

Other than that, backup utilities differ only in their ease of use, flexibility, and philosophy about how your backup files are stored and catalogued.

Even if your hard disk came with a utility, you might want to purchase a different one that is better suited to the way you want to protect your work. Although most of the products discussed here are bundled with one hard drive or another, all are also available from dealers and mail-order houses. Let's take a look.

HFS Backup, HD Backup, and Fastback

The archival approach is used by programs like HD Backup, Fastback, and HFS Backup. This approach keeps old versions of changed files in the backup set. In other words, when you perform an incremental backup, no files are deleted from the backup disks; instead, your backup set will contain multiple versions of all modified files.

All of these programs are easy to use. For both complete and incremental backups, you launch the program, begin your backup, then insert disks one at a time as the program directs you. If you're performing an incremental backup, the program will ask for new disks to be added to the set as needed. It's foolproof; nothing could be easier.

Although all of these programs are perfectly suitable for keeping your data safe, this group has, in my opinion, a severe drawback. Because these programs never delete files, they will use more floppy disks over time than Redux or DiskFit (which will be discussed in a moment). Sometimes many more.

For example, say you have 15Mb of files on your 20Mb hard disk. You'll find it takes about 22 floppy disks to do your first

complete backup. If one of those files happens to be a 350K database file that you modify daily, and you religiously back up your hard disk every day, at the end of 10 days you'll have saved 10 different versions of your 350K file—adding at least 5 floppies to your backup set!

As another example, consider my situation. If I use one of these programs to back up my 20Mb hard disk, at the end of a month my backup set is typically 60–70 disks. And now I have two 80Mb drives. Let's see, that would take 240 disks a month. At two dollars each? No thanks. That's almost enough money to buy some backup hardware! (Probably not a bad idea if your time is valuable. Later in this chapter we'll discuss hardware solutions to the backup dilemma.) Besides, I only need a copy of my hard disk as it is today; saving multiple versions of files wouldn't do me any good.

DiskFit and Redux don't do that. They intelligently ask you to insert the disk with the old copy of the database, delete it, and replace it with the latest version.

However, even though programs that use the archival approach are disk hogs, they may be useful if you feel that an archive, with daily versions of every file you change (assuming you back up daily) would be useful. If your situation is more like mine, though, Redux or DiskFit are the programs for you.

DiskFit and Redux

A better approach to disk backup is used by DiskFit and Redux. During incremental backups, these programs look for files that have changed, ask you to insert the specific disk from your backup set on which the changed file resides, then replace the old version with the new. So rather than keeping a backup set that's an archive of every version and revision, as HD Backup, Fastback, and HFS Backup do, these two programs keep a backup set that's a mirror image of your hard disk as of the last incremental backup. Thus, a DiskFit or Redux backup set accurately reflects the current contents of your hard disk. These programs don't store multiple versions of the same file, and your backup set doesn't swell to unreasonable proportions. A 20Mb drive will never take more than about 26 floppies to back up.

Unfortunately, DiskFit is somewhat less flexible than Redux. The current version doesn't allow you to select individual

files for backing up. (Redux offers this option and much more.) DiskFit isn't a bad program, however. If you bought a SuperMac drive, you got DiskFit for free, so go ahead and use it.

One nice feature of DiskFit is that it uses the Finder format on your backup disks. All of the other backup programs use a proprietary format to speed backup and reduce disk needs. This means you must use the program to restore files. You don't need DiskFit to restore your files from your backup set; just select them from the proper backup disk, and drag them wherever you like.

Although Redux doesn't offer this feature when you back up to floppies, it does offer the option of using a Finder-readable "Copy" option when you back up from any device to another larger device. So, I can use the Copy option to back up a 20Mb hard drive as long as the target volume for the backup is larger than 20Mb (such as another hard disk or removable media device). I often use this option when backing up one of my 40Mb hard disks to a 45Mb removable Winchester cartridge (discussed later in this chapter). That way, if I need to restore something, I just look on the 45Mb cartridge containing my backup set, find the file, and drag it back on to the 40Mb hard disk.

Redux uses the same "replace old files with new" intelligence as DiskFit, but adds a ton of power-user features, such as scripting, choice of copy or backup modes (if the target volume for the backup set is larger than the files to be backed up), intuitive graphical interface, and the ability to postpone backing up any file. It also has a well-written, easy-to-understand manual. If you need to purchase a backup utility, this is the one you want! It's elegant, flexible, fast, and functional.

Redux has an "easy" mode for doing complete and incremental backups. Once you've selected the volume or files you want backed up, you insert the first disk of the backup set. If this is a new backup set, insert any disk you don't mind erasing. Redux will prompt you through the procedure to start and name a new backup set. For incremental backups, when you insert the first disk of the backup set, Redux figures out what you want done for this particular set, then asks you to insert the disks it needs one at a time, until the backup is complete.

It's easy. First, select the volume to be backed up and click the Backup button. (Figure 4–3 shows the screen after I selected "Cruella" and clicked the Backup button.) Now select the first

disk of your backup set, New Backup Floppy, and click the Proceed button as shown in Figure 4–3. That's all there is to it. Redux will ask you for disks as it needs them.
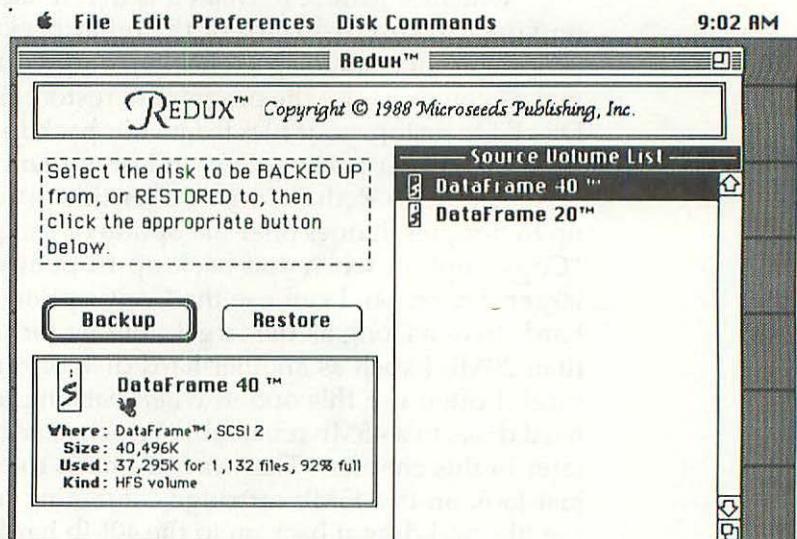

Figure 4–3
Redux's Easy
Mode

Redux's real beauty, though, lies in its advanced mode, which makes available additional power and flexibility. Using the advanced mode, you can tailor your backup sets to your precise needs. To get started, you need to select (what else?) Power User from the Preferences menu. Doing so changes the character of Redux completely. Figure 4–4 shows Redux ready to begin a complete backup of my internal 80Mb drive, Cruella, using the Power User mode. As you can see, there are 1,449 items (62,202K) to be backed up, and the backup will require 81 floppies, as indicated by the little floppy disk icon with the rabbit at the top of the screen.

Once you've invoked the Power User mode, you will see two new menus—Check/Uncheck and Special (Figure 4–5)—and two new pop-up menus—View and Show (Figure 4–6)—which allow you to get specific about what does and doesn't get backed up. In Redux parlance, if a file is "checked" it gets backed up; if it's "unchecked," it doesn't. Another useful feature is the ability to "postpone" backing up any file. That way, if you're in a hurry, you can postpone backing up any files you like for just that ses-

```
 ⌐   ⌂  File  Edit  Preferences  Check/Uncheck  Special              9:04 AM
 ┌──────────────────────────── Redux™ ─────────────────────────────┐
 │ Backup: DataFrame 40 ™   95 🖹 ▦    1,216 items (36,119 K) to back up.  │
 │   To: Backup Floppy 1                1,216 items (36,119 K) checked.    │
 │                                    ┌──────── File List ────────┐
 │      ┌──────────────────┐          │ ☑ ■ Scott Harris      5K  │
 │      │  View by Folder  │          │ ◄ ✓ ■ Applications  7,635K │
 │      └──────────────────┘          │ ◄ ✓ ■ Barry's Folder 1,406K│
 │      ┌──────────────────┐          │ ◄ ✓ ■ BDC/AStrike   1,786K │
 │      │ Show everything  │          │ ◄ ✓ ■ BOOK             38K │
 │      └──────────────────┘          │ ◄ ✓ ■ BusArt          274K │
 │                                    │ ☑ ■ CDEVs & Bears      9K  │
 │   ┌──────────┐  ┌──────────┐       │ ◄ ✓ ■ Colony        1,347K │
 │   │  Begin   │  │  Cancel  │       │ ◄ ✓ ■ Correspondence  110K │
 │   └──────────┘  └──────────┘       │ ☑ ■ Curator Catalog    2K  │
 │   ┌──────────────────────────┐     │ ☑ ■ DataBase Stack    216K │
 │   │ ▱                        │     │ ☑ ■ DataBase™         50K  │
 │   │        Scott Harris      │     │ ◄ ✓ ■ FileMaker4      654K │
 │   │                          │     │ ☑ ■ Friends.DB         7K  │
 │   │ Class: document, type "TEXT" │ │ ◄ ✓ ■ Games        2,780K  │
 │   │   Size: 2,805 bytes      │     │ ☑ ■ Home             126K  │
 │   │ Modified: Sat, Jul 30, 1988, 11:07 PM │ ☑ ◆ HyperCard  389K │
 │   │ Backed up: not yet       │     │ ◄ ✓ ■ Jam Session  1,104K  │
 │   └──────────────────────────┘     │ ☑ ■ LaserQueue       41K   │
 │                                    └────────────────────────────┘
 └──────────────────────────────────────────────────────────────────┘
```

Figure 4–4
Redux Advanced
Mode: File
Selection

sion. The next time you use that backup set, the files you post-
poned will be backed up, unless you postpone them again.

The larger and more complex your backup needs, the more
you'll love Redux. But rather than going on and on about these
whiz-bang features, let me show you how I used them to solve a
particularly tricky backup situation.

Using Redux to Solve Complex Backup Needs First, some
background: On my 80Mb drive I have a folder called "Other
Stacks" that contains over 20Mb of HyperCard stacks. It doesn't
contain my important stacks like Home and my custom-made
phone number database and dialer, but it does have stuff I wouldn't
want to lose. The problem is, whenever you open a file in Hyper-
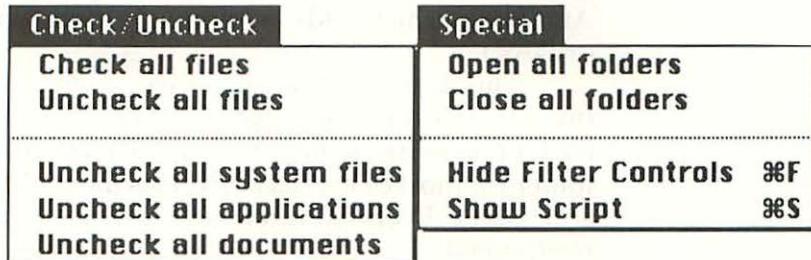
Figure 4–5
Redux Advanced
Mode: Menus

Check/Uncheck	Special	
Check all files	**Open all folders**	
Uncheck all files	**Close all folders**	
Uncheck all system files	**Hide Filter Controls**	⌘F
Uncheck all applications	**Show Script**	⌘S
Uncheck all documents		
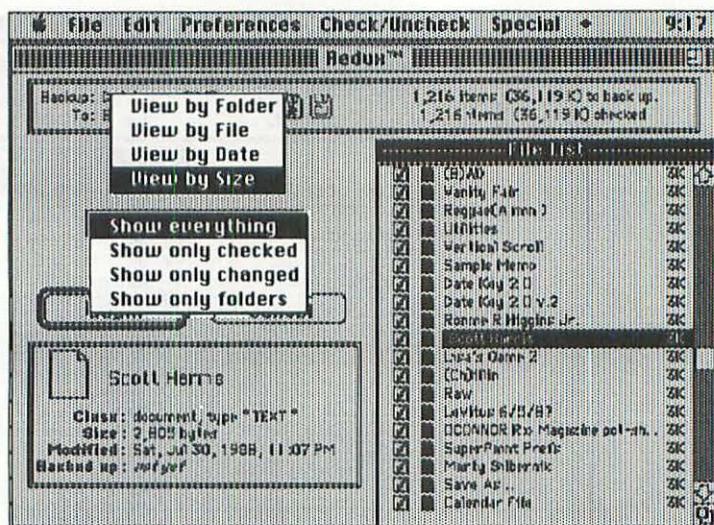
Figure 4-6
Redux Advanced
Mode: Pop-up
Menus

Card, the next time you back up, that file will appear to have been "changed" or "modified." This is because HyperCard, unlike most applications, saves your work automatically. Even if you only browse a stack without changing anything, HyperCard saves the file every few seconds. Because it does, your backup utility will think the stack has been changed and will want to back it up.

With most programs, this doesn't happen. If you open a file and don't make or save any changes, your backup program won't perceive it as changed and thus won't try to back it up. Database programs and other programs that save automatically, like HyperCard, cause a file to appear as changed even if all you did was open it and look for something, making no changes. (That's not to say auto-save isn't a good feature. It is. If you're using a program that has it, use it. If you're really forgetful, you might like AutoSave, which adds an auto-save function to most programs or DAs.)

This automatic saving causes a sticky situation at backup time. Here's how I solve it with Redux: because I don't want to back up everything in the "Other Stacks" folder, I postpone that folder for most of my backups. This makes backup sessions short and sweet. Every so often, when I can spare the time, I don't postpone it.

Because Redux is so flexible, you could solve problems like this several ways. Here's another way to resolve my HyperCard folder problem: I could have instructed Redux not to back up files of the type "STAK" and then checked the files "Home" and "Database Stack." Because you can filter (include or exclude files) by a number of attributes—System Files, Applications, Documents, file name begins with, file name ends with, file name contains, modified before or after, or file type—you could create a backup set to include just about anything.

Redux even has a simple scripting language, BackTalk. It doesn't force you to use it; in fact, everything that can be done with a script can also be done with menus and pop-ups. Redux works fine even if you never touch the script editor. Still, some people find it useful to script their backup sessions. The script for the session described in the previous paragraph would look like this:

```
Check all files
Uncheck all documents of type "STAK"
Check file "Home"
Check file "Database Stack"
```

On the days when I want to perform a full backup, I would change the script to read:

```
Check all files
```

All things considered, Redux is a superb utility for any Macintosh user. It has a slick, easy-to-use interface, and it backs up files quickly and easily. Only FastBack is significantly faster, but the current version of FastBack can back up only to floppy disks and some tape drives.

That brings up an important point: some programs don't allow you to back up to media other than floppies. If you have to buy backup software, make sure that it works with the backup device you intend to use. Redux and DiskFit currently offer the most flexibility; they will back up to and from MegaDrives, 45Mb removable drives, Bernoulli drives, and any tape drive that mounts an icon on the desktop.

Backup Hardware

If you own a large hard disk, you're not going to enjoy backing up to floppy disks for long. When your budget allows, you'll probably want to look into a high-capacity (anything larger than a floppy) backup device—tape, MegaDrive, Bernoulli, or, if you can afford it, a 45Mb removable Winchester.

You can use all of these devices except tape drives as an additional on-line storage device. So when I use words like "fast" and "faster" I'm talking about their speed in use as a hard disk, not as a backup device. The slower the device, the longer it takes to open an application or quit to the Finder. Once you've been spoiled by a fast hard disk, everything else seems agonizingly slow.

What's too slow for me may be fine for you. Your best bet is to find a dealer who will let you play with whatever hardware catches your eye. Launch your favorite application, open a file, save a file, and quit. Try it with another application. Then restart and see how quickly it boots. (Make sure it's not booting from an internal hard disk—use Startup Device in the Control Panel.) Only you can determine which device is fast enough.

A chart comparing backup times for various types of hardware (all performed using DiskFit for the sake of consistency) is provided later in this chapter.

Tape Drives

One of the most popular backup devices is the tape drive. These devices back up your information by reading it from your hard disk and recording (writing) it to something similar to an audio cassette tape. Tape drives come in cases of various sizes and shapes and are usually no larger than a hard disk. Most come with backup software of their own, and some are available as combination units, with hard disk and tape drive combined in one case. (I don't recommend this configuration. It seems cost-effective, but if one component—tape or hard disk—should fail, you're without both until repairs are completed.)

Tape drives have backup capacities of anywhere from 20 megabytes to 1.2 gigabytes. Genius offers a 2.2-gigabyte model (about $5,000) and Irwin Magnetics offer an 80-megabyte model (about $1,700). Tape drives that can hold 40 megabytes are the

most common and are available from a wide variety of manufacturers at prices starting at around $800. With tape drives, as with most mass storage and backup hardware, the higher the capacity, the more expensive the drive. (By the way, I don't recommend the Apple Tape Drive. It's slow and overpriced.)

The cost of the tapes for these drives varies, but the most commonly used varieties run about $30 each. So backing up a large hard disk usually requires no more than a tape swap or two, and shouldn't cost more than $100 for media. Sure beats 70 or 80 floppy swaps!

Prices are dropping and the number of manufacturers offering tape solutions is rising, so a tape backup system may be the most cost-effective way to protect your data.

The biggest drawback of using tape as a backup medium is that you can't use it for anything but backing up. With any other type of removable media, you can use one set of cartridge/disks for backups and another for everyday storage. Having any of these devices connected to your SCSI chain is like having an extra hard disk. You can boot from them and store applications or documents on them. If you can do it with your hard disk, you can do it with a removable media drive. And when the drive gets full, you slap in another cartridge/disk. Though removable media is usually more expensive than tape, this additional measure of functionality more than makes up for the difference in price.

Tape drives are one of the least expensive backup solutions. I prefer removable media because I hate the idea of spending money on something that can *only* back up. If you're going to have a device attached to the SCSI chain, I think it should be something more versatile than a tape drive. Still, you may prefer the convenience of a device that can back up a large hard drive unattended. Only tape currently offers that capability.

Optical Drives

There are two relatively new technologies you might like to explore. I have no hands-on experience with either, but I have seen them demonstrated at numerous trade shows. I expect they will become more popular—indeed, even become as common as hard disks are today—when prices decrease and their reliability is proven.

Both of these technologies use removable optical drives with capacities of better than 500Mb, written to and read by lasers.

The first type of device is called a WORM (Write Once Read Many) drive. WORMs are non-erasable. When a cartridge gets full, you just pop in a new WORM cartridge (about $200). Storage Dimensions has a WORM unit that uses 800Mb disks for around $5,000.

Another kind of optical drive, this one capable of both reading and writing 650Mb removable optical cartridges, is called a REO (Removable Erasable Optical) drive. Its price is around $6,000.

Aside from the obvious drawback of WORM drives (you can't erase things once they're on the disk), another problem is that optical drives are relatively slow. WORM and REO drives will perform even more slowly than floppy disks when used as a primary storage medium. Still, with their huge capacities, they may be an attractive option for backing up very large hard disks.

Removable (Non-Floppy) Disk Drives

MegaDrive The MegaDrive looks like a giant floppy disk drive, and it uses removable disks called MegaFloppies, which look like giant, hard-shelled floppy disks.

The difference is that, instead of holding 800K or 1.2Mb (as the floppy drives in the IIx and SE/30 do), a MegaFloppy will hold either 10 or 20 megabytes, depending on which model you've chosen. This technology has become quite popular as both a backup and an on-line storage device, primarily because of the reasonable prices of both drive and media—about $700 for the 10Mb drive and $35 each for MegaFloppies.

The MegaDrives, being SCSI devices, are capable of high-speed communication with your Mac. Unfortunately, the drives themselves are rather slow. Accessing an application from a MegaDrive feels about the same as accessing a floppy disk. If you own a hard disk, you will be disappointed by the MegaDrive's relative lack of speed. On the other hand, although it's slower than the Bernoulli drive or a 45Mb removable Winchester, you *can* use it as an on-line storage device. Which is why I recommend the MegaDrive over tape in most cases.

Backing up a hard disk to a MegaDrive is preferable to backing it up to floppies, by a long shot. And, even though it's not as fast as some of the other removable solutions we'll discuss, it *is* an inexpensive form of additional on-line storage.

Bernoulli Drives Bernoulli drives are similar to MegaDrives. They also come in 10- and 20-megabyte capacities and use a removable cartridge that looks a bit like a MegaFloppy: media encased in a hard shell. The difference is that these cartridges use a fluid dynamics principle that gives them greater protection against a head crash.

Bernoulli drives are not a good value unless you're extremely paranoid about head crashes. Prices for Bernoulli drives and media are almost as high as those for 45Mb removable Winchester drives, yet Bernoulli drives offer no significant advantage beyond a resilience to head crashes.

Bernoulli devices are recommended only where the utmost protection from head crashes is required.

45Mb Removable Winchester Drives If my description of Bernoulli devices made you worry about head crashes on other devices, rest assured. I've been using a 45Mb removable Winchester drive for 9 months now, and I have at least three or four friends using them, too. I have yet to experience, or hear of, a head crash. I like these drives so well that I got two of them, and, because backing up from one drive to another takes so little time, I'm covered if a head *should* crash. The point is, I consider the removable Winchester drives extremely reliable.

They are essentially removable hard disks. They use cartridges that contain a platter almost exactly like the ones used in hard disks. The difference is, these are removable; they are encased in a sealed plastic cartridge.

Removable Winchester drives have proven themselves to be as reliable as hard disks. Because they use the same technology as hard disks, these drives are faster than any other removable storage medium. I've grown to love them so much, I'm probably never going to buy another hard disk. They're not only great for backing up quickly, they're every bit as useful as a fixed hard disk when they're *not* backing up.

Many companies have products that use the same guts: a 45Mb removable mechanism manufactured by Syquest, which also makes the Winchester cartridges. So the units available are very similar. Unfortunately, both the drive and the media are rather expensive. Expect to find list prices starting at better than $1,200 for the drive and $125 per cartridge.

I'm using two removable drives from Mass Micro Systems. I'm impressed. The drives have always been perfectly behaved and I recommend them without hesitation. The company offers 24–hour technical support and bundles the drives with a full complement of useful utility software. Now, if only they'd include Redux instead of the mediocre backup program they bundle now.

Removable Winchester drives are great both for backup and for everyday use as a hard disk. In fact, if you purchase two of them like I did, you may not need a hard disk at all. You can back up from one drive to another, and you'll have 90Mb of hard disk storage available when you're not backing up. And it's so fast! Backing up a 20Mb hard disk will take less than 6 minutes, and a complete backup from one 45Mb cartridge to another will only take about 10 minutes.

These are my favorite mass storage devices. I have a pair of them in my office; they work like a pair of very fast 45Mb hard disks. Even though they're expensive, I think they're worth it.

Comparing Backup Device Speeds

Table 4–1 compares the speed of various backup devices. In each case, DiskFit was used to back up 10Mb, 20Mb, and 40Mb of data from a Jasmine 80 hard disk to the device being tested. These times are for a complete backup; incremental backups will be significantly faster.

Times for a complete restore should be about the same or slightly longer than backup times. Restoring a single file or group of files shouldn't take much longer than copying files from disk to disk. The exception is restoring when using tape drives, which can take a long time (5 minutes or more) to locate a single file to restore.

As you can clearly see, the 45Mb removable Winchester drive is the fastest in backing up hard disks of any size. Because it's faster than most hard disks, it also makes a wonderful full-time storage device. If you can afford it, it's the best solution.

Backup Times (minutes:seconds)

Device	10Mb	20Mb	40Mb
Apple 40SC			
(40Mb Tape)	10:32	21:45	43:32
MegaDrive 10			
(10Mb MegaFloppy)	5:29	12:44	22:12
MacPeak T60			
(60Mb Tape)	4:59	9:00	13:48
Bering Totem 20			
(20Mb Bernoulli)	4:13	8:58	18:30*
Mass Micro DataPak			
(45Mb removable Winchester)	2:55	5:40	10:44
Floppy Disks	12:00	26:30	48:15

*Bernoulli times include delays to erase second cartridge for backing up the 40Mb set; required additional 2:10.

Table courtesy of Ed Tittel. Ed Tittel writes regularly about Macintosh technology and is the author of the forthcoming Addison-Wesley book: TOPS: An Administrator's and User's Guide. *The table originally appeared in* MACazine's *July, 1988 issue. Used with permission.*

Table 4-1

Disk and File Security

Another topic worth considering is disk and file security in your work place. You probably won't be the target of industrial espionage, so you may not have given much thought to security, but think about this: do you have personnel, salary, or customer files stored where someone might access or copy them? If you have files of a sensitive nature on your hard disk, you might want to consider some of the hardware and software available to protect your data from prying eyes.

If you own an SE with an internal hard disk, you might consider buying The Muzzle, from Ergotron. It's a hardware device that protects your SE from being used in your absence. It is made out of a sturdy metal and protects your SE by wrapping around it and covering the disk drive and power switch. Sort of like a chastity belt for your computer.

Most of the software that can protect your files uses some type of encryption/decryption scheme. Using the software, you select a file you want to protect and assign a password for that particular file. The software then encrypts the file and writes it to your disk in a format that can be accessed only by someone with the password. You must use the same software to decrypt the file.

Sentinel, MacSafe, and Hard Disk Deadbolt are products that allow you to password-protect (encrypt) files and folders. If you want to password-protect your entire hard disk, you'll need The NightWatch or Hard Disk Deadbolt, which can keep an entire hard disk from being used without the proper password.

Encrypting and decrypting files can be time-consuming. It takes at least as long to encrypt a file as it would to save it, and probably longer. Securing your data is a personal choice. Only you can decide how much (or how little) data security is enough.

Recommendations

We talked about being sure your data is safe. This can involve both hardware and software. Here are my recommendations:

Backup
Software

Redux

MicroSeeds
7030-B West Hillsborough Avenue
Tampa, FL 33615
813–882–8635
Approximately $100
Plus, SE, II, IIx, IIcx, SE/30

The ultimate backup utility. Bundled with Jasmine hard drives. If you need a backup utility, this is it.

DiskFit

> SuperMac Technology
> 485 Potrero Avenue
> Sunnyvale, CA 94086
> 408–245–2202
> Various sizes and prices
> Approximately $100
> 512Ke, Plus, SE, II

Another excellent backup utility—almost as nice as Redux. Bundled with SuperMac drives.

FastBack

> Fifth Generation Systems
> 11200 Industriplex Boulevard
> Baton Rouge, LA 70809
> 504–291–7221
> Approximately $100
> 512K, 512Ke, Plus, SE, II, SE/30

A fast archive-type backup utility that uses a proprietary floppy disk initialization technique. Backups are very fast, and backups to uninitialized disks are particularly speedy. The current version, 1.02, can't back up to anything but floppies.

HFS Backup

> PCPC
> 4710 Eisenhower Boulevard
> Tampa, FL 33634
> 800–622–2888
> 813–884–3092
> Approximately $60
> Plus, SE, II, IIx, SE/30

HFS Backup was one of the first disk backup utilities available. An upgrade that should be available by the time you read this, Version 3, is rumored to bring HFS Backup into the same league as Redux and DiskFit.

PCPC is one of the oldest manufacturers of Mac hard drives. They bundle a copy of HFS Backup with every drive they sell.

HD Backup
> Apple Computer, Inc.
> 20525 Mariani Avenue
> Cupertino, CA 95014
> 408–996–1010

HD Backup is a no-frills backup utility that is included with Apple System Software releases.

Tape Drives   **Model 5040/5080**
> Irwin Magnetics
> 2101 Commonwealth Boulevard.
> Ann Arbor, MI 48105
> 313–930–9000
> 40Mb Tape Backup (Model 5040): Approximately $1,400
> 80Mb Tape Backup (Model 5080): Approximately $1,700

Irwin is one of the leaders in tape drive technology. Their 80Mb drive is an excellent value, if your hard disk is larger than the 40Mb size that fits on most tapes.

DirectTape
> Jasmine Technologies, Inc.
> 1740 Army Street
> San Francisco, CA 94124
> 800–347–3228
> 415–282–1111
> Approximately $1100
> Approximately $900 if purchased with a Jasmine drive.

The Jasmine DirectTape is a reasonably priced 40Mb tape drive.

2GIG
> Genius, Inc.
> 3958 Van Noord
> Studio City, CA 91604
> 818–905–8866
> Approximately $5,000

2.2 gigabyte tape drive. Uses standard 8mm videocassettes.

Apple Tape Backup 40SC
> Apple Computer, Inc.
> 20525 Mariani Avenue
> Cupertino, CA 95014
> 408–996–1010
> Approximately $1,500

Unspectacular, slow, and overpriced, the Apple Tape Backup 40SC has little to recommend it.

MegaDrives

MegaDrive 10/20
> Jasmine Technologies, Inc.
> 1740 Army Street
> San Francisco, CA 94124
> 800–347–3228
> 415–282–1111
> MegaDrive 10: Approximately $700
> MegaDrive 20: Approximately $1,000

The MegaDrives are slower than most other removable media (such as Bernoulli or removable Winchester drives), but their pricing makes them attractive despite their somewhat sluggish performance when used as a primary storage device.

Bernoulli
Drives

Iomega Corporation
> 1821 West 4000 South
> Roy, UT 84067
> 801–778–3000
> Various configurations and prices

Iomega is the leading manufacturer and inventor of Bernoulli hardware. Other firms that produce Bernoulli hardware, such as Bering, license the technology from Iomega.

Bering
240 Hacienda Avenue
Campbell, CA 95008
800–BERING1
800–533–DISK (CA only)
Various configurations and prices

Bering is another leading manufacturer of Bernoulli hardware.

45Mb
Removable
Winchester
Drives

Mass Micro Systems
550 Del Rey Avenue
Sunnyvale, CA 94086
800–522–7979
408–522–7979
Various sizes and prices

Manufacturer of a wide variety of mass storage and video products. Their 24-hour technical support is a boon if you work odd hours. (I've tried it; there really is someone there who will return your call in the middle of the night!)

Micronet Technology, Inc.
13765–A Alton Parkway
Irvine, CA 92718
714–837–6033
Various sizes and prices

Another good source for 45Mb removable Winchester drives.

Laser Drives

Storage Dimensions
2145 Hamilton Avenue
San Jose, CA 95125
408–879–0300
LaserStor WORM drive: Approximately $5,000
Additional 800Mb cartridge: Approximately $150

Pinnacle Micro
>Pinnacle Micro
>15265 Alton Parkway
>Irvine, CA 92718
>800–553–7070
>714–727–3300
>REO–650 (650Mb Removable Erasable Optical drive):
>Approximately $6,000
>Additional 650Mb cartridges: Approximately $230

Security
products

The Muzzle
>Ergotron, Inc.
>3450 Yankee Drive, Suite 100
>Eagan, MN 55121
>612–452–8135
>Approximately $70
>Mac SE and SE/30 only

The Muzzle is a hardware device designed to secure the Mac SE.
Ergotron also markets an excellent line of monitor stands of vari-
ous types. A Mac II model will be released sometime in 1989. Call
for details.

Sentinel
>Supermac Technology
>485 Potrero Avenue
>Sunnyvale, CA 94086
>408–245–2202
>512Ke, Plus, SE, II, IIx, SE/30
>Approximately $300

Sentinel is an ultra-sophisticated encryption and decryption
program.

MacSafe/The NightWatch
Kent Marsh Ltd.
1200 Post Oak Boulevard, Suite 210
Houston, TX 77056
800–325–3587
MacSafe: Approximately $150
512Ke, Plus, SE, II, IIx, SE/30
NightWatch: Approximately $150
512Ke, Plus, SE, II, IIx, SE/30

Kent Marsh makes nothing but security products, so you have to believe they know what they're doing. According to the company's C.E.O., Andy Utter, there are more Kent Marsh security products in use at Fortune 1000 companies than any other brand.

Hard Disk Deadbolt
FWB Software, Inc.
2040 Polk Street, Suite 215
San Francisco, CA 94109
415–563–8381
Approximately $90
512K, 512Ke, Plus, SE, II, IIx, SE/30

Hard Disk Deadbolt is another extremely flexible security utility that can encrypt files, folders, partitions, and even entire hard disks. Comes with both an application and a DA.

Miscellaneous **AutoSave**
Magic Software
1602 Cascio Drive
Bellevue, NE 68005
800–342–6243
402–291–0670
Approximately $50
Versions available for all Macs

AutoSave does just what the name implies; it can be configured to save your work automatically at intervals of however many minutes you choose. Perfect for absent-minded people.

Summary

Don't underestimate the necessity of backing up. It is something you must get used to doing on a regular basis. The best thing to do is set up a routine that provides you with the degree of protection you need, and stick to it. Think about what might happen if your hard disk crashed and everything on it was destroyed. A few minutes a day, and you'll never worry about it.

If you need more convenience and speed than backing up to floppies provides, consider another backup medium. Tape is relatively inexpensive but can't be used as a hard disk between backups. MegaDrives are also inexpensive, and although they can be used as a hard drive, their access time is slow. If you're used to working with a hard disk, an application run from a MegaFloppy disk will seem sluggish.

Some people buy a second hard disk the same size as the first and back up from one to another. This is very fast—about the same transfer rate as from a 45Mb Winchester to/from a hard disk. Considering how quickly hard disk prices are dropping, this may be a cost-effective solution.

Still, I love my 45Mb Winchesters. They're the Ferarri of mass storage products—the ultimate solution. Faster than most hard disks and capable of storing a whopping 45Mb per cartridge, this is what you buy when nothing but the best will do.

5

Hardware Upgrades

What and when to buy.

Adding hardware to your Macintosh system can be expensive, but in many cases, it's worth it. In this chapter I'll show you why.

Many types of hardware add-ons exist to help you do more work in less time. This chapter covers the three add-ons I consider most productive—RAM upgrades/MultiFinder, accelerators, and large-screen monitors.

I'll explain what each category of product is and what it does. I'll give you some guidelines on what kind of user will benefit most, and I'll provide a formula for determining whether the product will be cost-effective for you. Finally, I'll give you my recommendations on what to buy and who to buy it from.

If you're wondering, here are the configurations for both of my Macintoshes—the one at my house, and the system I used at MACazine before it folded:

> Office: *Macintosh Plus, 4Mb RAM, Radius Full Page Display, CMS 80 hard disk. We had 15 Macs, which shared two QMS PS-800+ laser printers and one AppleTalk ImageWriter. (A regular ImageWriter II cannot be shared. Sharing requires that an AppleTalk card be installed in your ImageWriter II.)*

> Home: *Macintosh II, 5Mb RAM, Apple Color 13-inch monitor, Apple Video Card with Expanded Video RAM, Technology Works 80Mb hard disk, Two Mass Micro DataPak 45Mb Removable Winchester drives, an ImageWriter II, and a Jasmine DirectPrint LCD printer.*

(You'll notice that neither machine has an accelerator. It's not that I don't want one, but the Mac II doesn't need it and I don't have the Plus anymore. If I had kept the Plus, I would certainly have accelerated it.)

RAM Upgrades and MultiFinder

What RAM Is
RAM (Random Access Memory) is the working memory in your Mac. The standard configuration for most of today's Macintoshes is 1Mb of RAM (1 megabyte = 1,024 kilobytes). The Mac Plus and SE can be expanded to a maximum of 4Mb of RAM; the Mac II, IIx, IIcx, and SE/30 can use up to 8Mb.

Unlike the CPU (central processing unit), RAM has no brains. It's nothing more than very fast memory chips that are used for the temporary storage of information your computer needs to access quickly—more quickly than it could from any disk.

A technical discussion of RAM could fill this chapter, or even a whole book. In an attempt to prevent confusion, I present in the next section an extremely simplified description of RAM and how it affects you as a Macintosh user.

How RAM Works (Extremely Simplified Version)

Whenever you launch an application program, the program is copied from the disk on which it resides and loaded into RAM. The copy of the program remains in RAM until you quit the application. (The application itself, the one on your disk that's represented by the icon you double-clicked, remains safely on the disk and is unchanged.) Once a program is loaded into RAM, it will execute (run) dozens of times faster than it would if it were running directly from a disk.

That's why your computer has RAM.

Why is RAM so fast? There are no mechanical parts in a RAM chip. When the computer needs to read from RAM, it does it at lightning speed. If it were accessing a disk, there would be a delay as the heads moved and the proper sector was located. RAM is all electronic, so there's no perceptible delay between the time your computer asks for the information and the time it retrieves it from RAM.

More than just programs are loaded into RAM. Parts of the System and Finder are loaded into RAM at boot time, as are CDEVs and INITs. So even if you have 1Mb of RAM in your Mac, there may be significantly less than that available to run applications.

In a nutshell: RAM is the temporary storage area of your computer, where applications, documents, parts of the System and Finder, INITs, and CDEVs are loaded for the fastest possible retrieval.

To find out just how much RAM your System software is using, select About the Finder from the Apple menu in the Finder. As you can see in Figure 5–1, my System software uses over 900K. That's because I've got about a million INITs and CDEVs running. Even so, because this Mac II has 5Mb of RAM, I've still got more than 4,100K that I can use to open applications and documents. That's enough to run at least three or four applications at the same time, which is probably the major reason power users prefer to work with lots of RAM.

To find out how much RAM an application uses, select its icon and Get Info from the Finder's File menu. In Figure 5–2 you can see that Word's Suggested Memory Size is 384K. If you're running under the Finder (that is, not under MultiFinder), that's approximately how much RAM the program requires to open. The Suggested Memory Size is determined by the manufacturer and can't be changed.

```
┌─────────────────────────────────────────────────────────────┐
│              About the Macintosh™ Finder                     │
├─────────────────────────────────────────────────────────────┤
│  Finder :   6.1        Larry, John, Steve, and Bruce         │
│  System:    6.0.2      ⑧Apple Computer, Inc. 1983-88         │
│                                                               │
│  Total Memory :   5,120K  Largest Unused Block :  1,343K     │
├─────────────────────────────────────────────────────────────┤
│   MacPaint 2.0        768K   ▓▓▓░░░                           │
│   =Word               512K   ▓▓▓▓█                           │
│   Finder              260K   █                               │
│   System            2,237K   ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓█            │
└─────────────────────────────────────────────────────────────┘
```
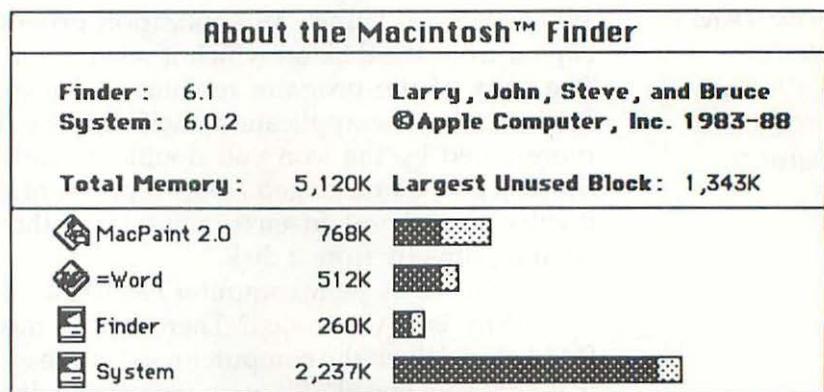
Figure 5–1
About the Finder
on a 5Mb Mac II

The number you see below the Suggested Memory Size in Figure 5–2, Application Memory Size, applies only when you're using MultiFinder. If you are, you can allocate more or less RAM to an application. It's almost never a good idea to allocate less, but it's often helpful to allocate more. As you can see, I've given Word 768K of additional RAM for a total of 1Mb (1,024K). This allows me to open Word and a few large files, such as the chapters in this book, without running out of memory—a very handy feature!
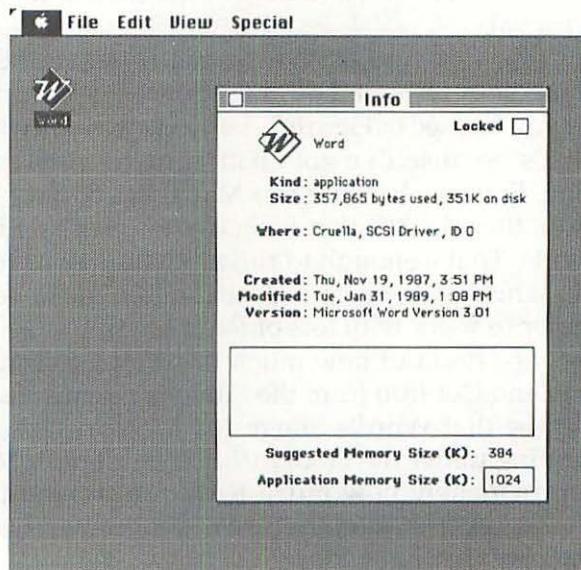
Figure 5–2
Suggested
Memory Size Tells
You How Much
RAM a Program
Needs


```
 🍎  File  Edit  View  Special

 ┌──────────────────────────────────────────────┐
 │  ☐═══════════    Info    ═══════════          │
 │   Ⓦ   Word                      Locked ☐      │
 │                                               │
 │   Kind : application                          │
 │   Size : 357,865 bytes used, 351K on disk     │
 │                                               │
 │   Where : Cruella, SCSI Driver, ID 0          │
 │                                               │
 │   Created : Thu, Nov 19, 1987, 3:51 PM        │
 │   Modified : Tue, Jan 31, 1989, 1:08 PM       │
 │   Version : Microsoft Word Version 3.01       │
 │                                               │
 │   ┌─────────────────────────────────┐         │
 │   │                                 │         │
 │   └─────────────────────────────────┘         │
 │                                               │
 │   Suggested Memory Size (K) :  384            │
 │   Application Memory Size (K) : │1024│         │
 └──────────────────────────────────────────────┘
```

MultiFinder

When you have 2 or more megabytes of RAM, you can use Multi-Finder, which has been a part of Apple System Software since 1987. When you use MultiFinder, you can open more than one application at a time, and you can switch quickly between them. I would say the primary reason for getting more RAM is so that you can use MultiFinder.

Although MultiFinder *can* be used on a 1Mb machine, it doesn't do much in that environment. That's because after your System and Finder load into RAM, there's not much RAM left—usually not enough to open more than one application. You might get away with using MultiFinder on a 1Mb Mac and be able to open two applications with very small memory requirements, but I'd have to say that the functional minimum for using MultiFin-der is 2Mb of RAM.

To see how MultiFinder works, even if you only have 1Mb of RAM, select a start-up volume's icon in the Finder, and use the Set Startup command in the Special menu. A dialog box will of-fer you the following choices: "Start up 'Your Volume Name Here' with: Finder or MultiFinder." (See Figure 5–3.) Select MultiFin-der in the top part of the box and MultiFinder Only in the bot-tom, then restart your Mac. When you get back to the desktop, you'll be running under MultiFinder.

Another way to start MultiFinder is to double-click on its icon while holding down the Command and Option keys.
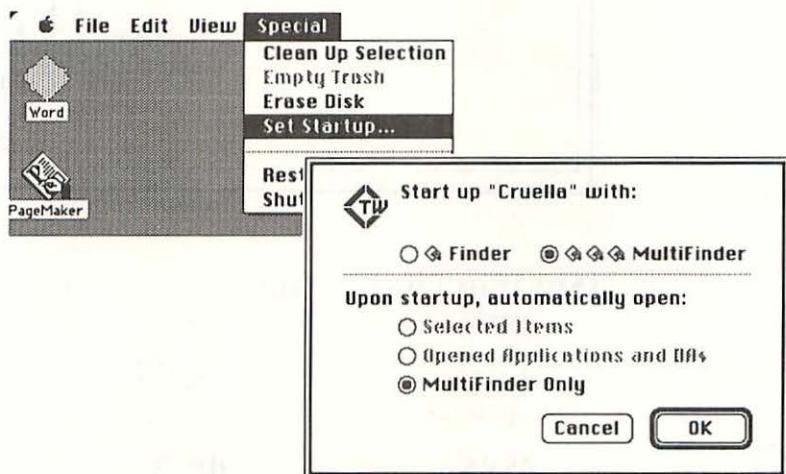
Figure 5–3
Turning MultiFinder
On and Off

The most convenient way to occasionally launch MultiFinder is the tip in the next section for making MultiFinder a double-clickable application.

Launching MultiFinder from the Finder If you want to use MultiFinder but don't want to set your Mac to start up in it, here's what you do—you trick it into thinking MultiFinder is an application instead of a System file. Then, when you want to use MultiFinder, all you need to do is double-click to launch it.

First you need a copy of DiskTop (CE Software), miniDOS (shareware), FileStar (shareware) or any other program or DA that allows you to change type and check bits. Make a copy of MultiFinder and move it out of the System Folder. Place it at root level (that is, not in any folders) or on the gray desktop. Launch
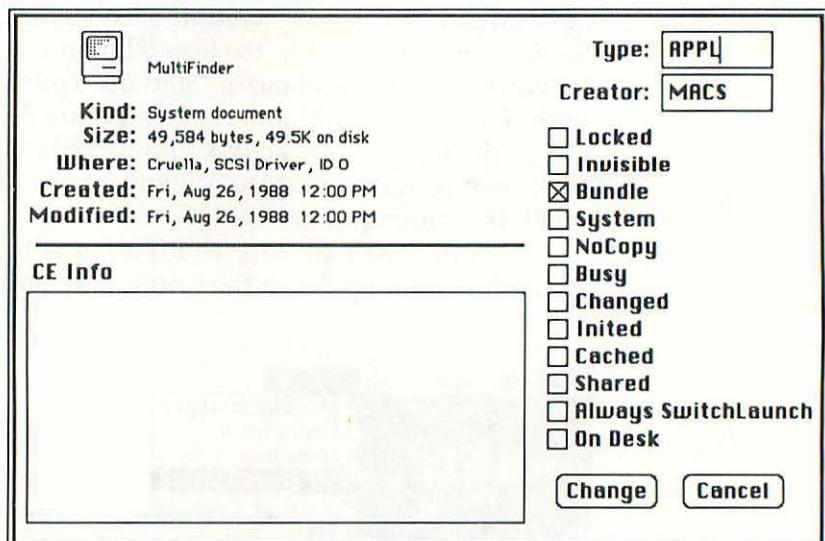
Figure 5–4
Using DiskTop To Change MultiFinder from a System File to an Application

MultiFinder

Kind: System document
Size: 49,584 bytes, 49.5K on disk
Where: Cruella, SCSI Driver, ID 0
Created: Fri, Aug 26, 1988 12:00 PM
Modified: Fri, Aug 26, 1988 12:00 PM

CE Info

Type: APPL
Creator: MACS

☐ Locked
☐ Invisible
☒ Bundle
☐ System
☐ NoCopy
☐ Busy
☐ Changed
☐ Inited
☐ Cached
☐ Shared
☐ Always SwitchLaunch
☐ On Desk

[Change]   [Cancel]

Figure 5–5
MultiFinder Icons

(System File)

MultiFinder

ZSYS

(Application File)

MultiFinder

APPL

whatever program you're using to make the modifications (Disk-Top, FileStar, etc.) and change MultiFinder's type, "ZSYS," to "APPL." Check the bundle bit and uncheck the System bit. These steps are shown in Figure 5–4, using DiskTop to make the modifications.

This procedure safely changes MultiFinder from a System file to an Application file. After performing the modification, you'll notice that the altered MultiFinder has a different icon, shaped like an application icon. (Figure 5–5 shows both icons.) From now on, if you want to use MultiFinder, just double-click it on your gray desktop.

By the way, you can't reverse this trick. Once you've launched MultiFinder, there's no way to return to the Finder without re-booting.

Using MultiFinder To witness MultiFinder in action, open one or two folders in the Finder, so you'll see something when you switch back. Now launch your word processor (FullWrite Professional may use too much RAM for this demonstration to work on a 1Mb Mac, but if you're a FullWrite user and you're in a daring mood, go ahead and try it anyway. It could cause a crash, so make sure you've backed up anything you care about, just in case.) Type a few lines and shrink the window enough to see what's behind it. You should be able to see the folders you opened peeking out from behind your word processor window.

There are three ways you can switch between open applications and the Finder when you're running MultiFinder. These ways are illustrated in Figure 5–6:

1. Select from the DA menu.
2. Double-click the grayed-out application icon.
3. Click the icon in the upper right corner of the menu bar to cycle from one open application to the next.

To turn MultiFinder off and return to using the Finder, simply reverse the procedure you used to turn it on. If you've forgotten how you did it, here's what to do: select the icon of the volume that's running MultiFinder. Use the Set Startup command in the Special menu to "Start up 'Your Volume Name Here' with: Finder or MultiFinder." This time select Finder in the top part of the box and Finder Only in the bottom.
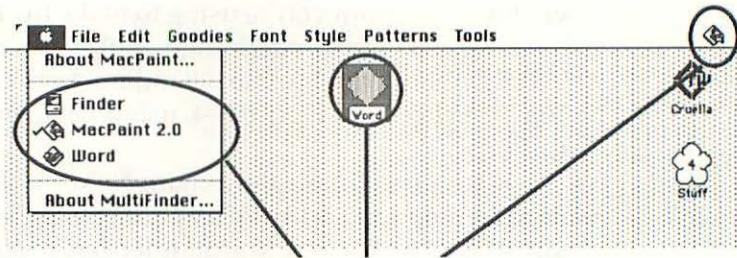
I've got 5Mb in my Mac, and I use MultiFinder every day. I can't imagine having to do without it; it's perfect for the way I work. For example, as I'm writing this, I'm using Microsoft Word and MacPaint II at the same time. That way I can switch quickly between writing and modifying graphics/screen shots. I don't have to quit Word to touch up a screen shot in MacPaint. I just switch from one program to another, using any of the three methods illustrated in Figure 5–6.

Figure 5–7 illustrates what I'm doing right now. I'm using Word (top window) and MacPaint (lower left window.) You can also see the Finder peeking through on the right. That's another convenient feature of MultiFinder—you can use the Finder at any time.
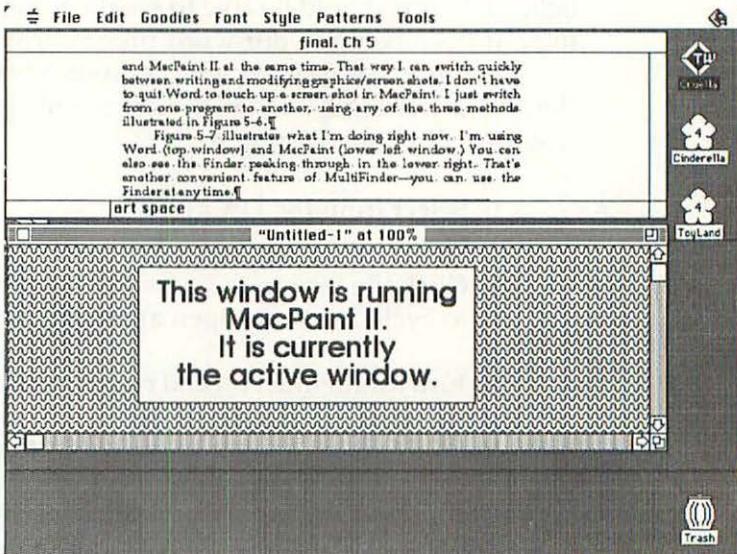
Figure 5–7
MultiFinder
Running Multiple
Applications

In Figure 5–7, MacPaint II is the active application. You can tell by the little icon in the right corner of the menu bar. It changes to the icon of whatever application is active at the time—right now it's the MacPaint icon. If you're familiar with MacPaint, you may also notice that the menu bar belongs to MacPaint.

Another Reason For RAM Upgrades

In addition to being able to use MultiFinder, there is another reason to consider additional RAM—certain programs will run out of memory when you open a large document on a 1Mb machine, and others (primarily color paint programs) require more than 1Mb to run properly.

For example, FullWrite Professional, a word processor, may be unable to open documents larger than 20–30 pages on a 1Mb Mac (though the publisher, Ashton-Tate, is said to be working on a version that will open any size document on a 1Mb Mac). PixelPaint, a color paint program, and Adobe Illustrator '88, a sophisticated PostScript graphics program, are others that may complain about lack of memory when used on a 1Mb Mac. If you have any INITs (Startup Documents) or CDEVs (Control Panel Documents) in your System Folder, moving them temporarily to any other folder may free up enough RAM to run these programs. If you don't understand, reread the section in Chapter 2 on INIT conflicts.

Even if you disable all of your INITs and CDEVs and are able to open a large file, or one containing complex graphics, you could have problems working with it. You may begin to get warnings that you are low on memory. Some applications will tell you to close some windows and save your work. The applications I mentioned above are well behaved on this point and will notify you when RAM is getting full. Others may crash or freeze. Again, the more RAM you have, the less likely you are to have these problems.

It seems that the more powerful the application, the more likely it is to be a memory hog. Although the programs discussed in the previous paragraphs will run, albeit in a somewhat hindered fashion, on a 1Mb Mac, there are now programs that *absolutely require* more than 1Mb of RAM to operate. The heavily advertised OmniPage optical character recognition software, which requires 4Mb, is one of the first. Rest assured there will be many more.

Who Will Benefit Most from RAM Upgrades?

Unless you only use one application all day, you'll probably benefit from a RAM upgrade and the ability to use MultiFinder.

If you find yourself quitting one application, returning to the Finder, then launching another application more than a few times a day, MultiFinder will save you a lot of time.

On most days, my Mac has Word, HyperCard and the Finder running simultaneously. So my telephone number list and to do list, which are HyperCard documents, plus whatever I'm editing or writing in Word, are only a mouse click away. And, because I've got 5Mb to work with, there's enough RAM to open MacPaint or MacDraw if I need to examine or edit a graphic.

If you upgrade to 2Mb, you'll usually be able to run two or three programs at a time, unless one of them is a memory hog, as discussed previously. If you upgrade to 4Mb or more, you'll be able to open 3 or 4 programs at a time.

No matter how much RAM you decide to add, you can coax even better performance out of your Mac by changing the RAM cache to a higher setting (in the Control Panel DA, click on the General icon). The RAM cache is a special area of memory (RAM) set aside for frequently accessed data. Because data can be read from RAM far faster than from disk, a cache makes your computer feel like it's running faster.

I advise against using the RAM cache on Macs with only 1Mb of RAM. This is because at settings below 256K, the effect is barely noticeable. On a multimegabyte machine, try setting the cache to at least 256K; you should see some performance improvement, especially when quitting to the Finder from an application. This is because part of the Finder is usually in the cache at any given time. You'll also see an improvement in the speed of the Find or Search functions in many applications with a cache of reasonable size. I keep mine set to 384K on my 4Mb Plus and 512K on my 5Mb II (Figure 5–8). I arrived at these figures through trial and error—if the cache was much smaller, the speed improvement wasn't perceptible; if it was much larger, I began running out of memory for applications.

I suggest you try various settings for your cache. You'll need to reboot between changes in order for them to take effect. The speed improvement is subtle, so if you can't tell that the cache is on, return to the Control Panel, increase the setting and reboot. It really is subtle; if you don't feel a difference after a day or two

Control Panel

Desktop Pattern

Rate of Insertion
Point Blinking

Slow   Fast

Keyboard

Menu Blinking

Mouse

Off 1 2 3

QuickKeys™

3.3.1

Time

10:45:26 AM

◉ 12hr. ○ 24hr.

Date

2/ 1/89

7
6 -
5 -
4 -
3 -
2 -
1 -
0 -

RAM Cache 512K   ◉ On
                   ○ Off

Speaker
Volume
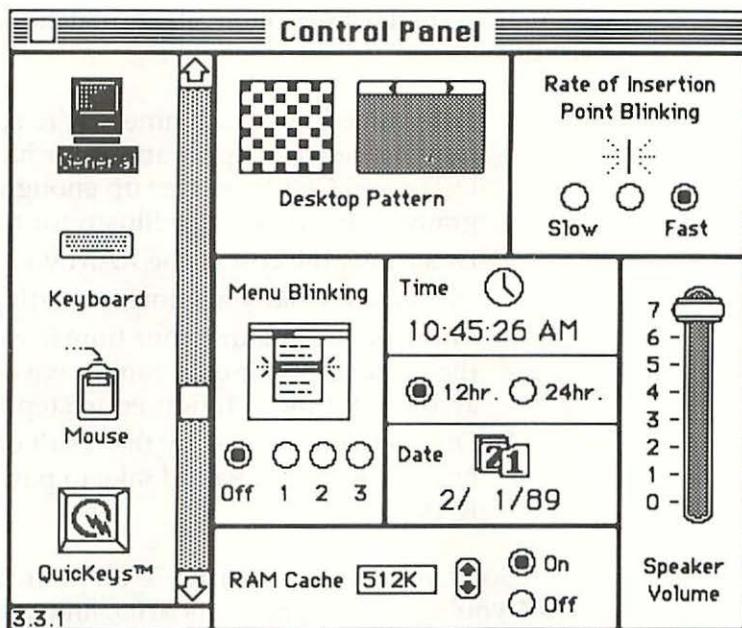
Figure 5–8
Setting the RAM
Cache to 512K
in the Control
Panel DA

with the setting at 384K or 512K, return to the Control Panel and
turn the cache off. There's no sense wasting perfectly good RAM
on the cache if you can't perceive a difference.

I'm pretty sensitive to it. I can tell if it's on or off within
minutes of sitting down at my Mac. On the other hand, I know
many people who can't. Experiment to find out what's right for
you.

**Is Additional
RAM Worth
the Cost?**

You need to examine your work habits to find out if a RAM upgrade
will be cost-effective for you. If you find yourself opening one
application, closing it, opening another application, closing it, etc.,
you're a logical candidate for more RAM. If you often find your-
self copying and pasting between two or more applications, you
should think about more RAM and MultiFinder. You're also a
candidate for more RAM if you intend to use memory-intensive
applications such as those mentioned previously, or if you need
to create very large documents in almost any application.

If any of the descriptions above matches your habits or needs, try this:

1. Determine how much time you're spending each day moving between applications (or having to disable INITs and CDEVs to free up enough RAM for programs like FullWrite or Illustrator to operate).
2. Determine the cost of the RAM you're considering.
3. Determine what your time is worth per minute.
4. Multiply the amount your time is worth per minute by the number of minutes you'll save each day (that is, the amount of time you figured in step 1).
5. Divide the RAM cost by the result of step 4 to determine how long it would take to pay back the cost of the RAM.

So, if your time is worth $20 an hour ($0.33 a minute), the RAM you're considering costs $700, and you figure you'll save 10 minutes a day, the RAM will have paid for itself in 210 days:

```
$700 ÷ (0.33 dollars per minute * 10 minutes per
day) = 210 days
```

If you're like me, you'll save a lot more than 10 minutes a day. If so, change the number in the equation to reflect the savings you expect. I'd say I save about 30 minutes a day since upgrading to 5Mb.

This approach works beautifully on your boss.

Which RAM to Buy

RAM is fairly generic. In other words, one vendor's RAM is about the same as another. You want to purchase your RAM from a reliable vendor: one that offers at least a one-year guarantee. Apple-branded RAM is usually more expensive than others, so shop around.

There *are* a couple of other things you should know:

- Not all RAM runs at the same speed. Mac Plus and SE motherboard RAM (that is, what the Mac came with) runs at 150 nanoseconds (that's 150 billionths of a

second!). Mac II, IIx, IIcx, and SE/30 RAM is faster,
running at 120 nanosecond (ns). That's because the
CPU used in these machines is capable of using faster
RAM. If you're upgrading an SE or Plus, you *can* use
120ns RAM if you like. You cannot use RAM slower
than 120ns in a II, IIx, IIcx, or SE/30. Remember, the
lower the number, the faster the RAM.

To make matters more confusing, you can find 100ns
and 80ns RAM, but it's even more expensive. In most
cases, the difference in speed will not be that apparent.
The only sure way to find out what will work in your
configuration is to talk to the vendor at length before
you buy any upgrade.

- Macintosh RAM is provided in packages called SIMMs
(Single In-line Memory Modules). Each SIMM contains
eight surface-mounted RAM chips on a small printed
circuit board; these chips add up to either 256K (256K
SIMMs) or 1,024K (1Mb SIMMs.) The Mac Plus and SE
can accommodate two or four SIMMs; the Mac II can
accommodate four or eight.

There are two varieties of SIMM—low-profile and
DIP. In operation, and in every respect but size, they
are exactly the same. The only difference is that DIP
SIMMs are slightly taller than low-profile SIMMs. If
you intend to add other internal upgrades such as an
internal disk drive or an accelerator, it may be neces-
sary for you to use only low-profile SIMMs. That's
because SIMMs sit very close to the internal drive
mount and the card slots on both SEs and IIs. The taller
DIP SIMMs may interfere with the physical installation
of cards and internal drives, so you'll need to check
with the vendors of any cards or drives you're inter-
ested in before making a purchase decision between
DIP and low-profile SIMMs. Low-profile SIMMs being
more desirable, are slightly more expensive.

- SIMMs (like all the products in this chapter) are avail-
able from most computer stores and from a wide
assortment of mail-order vendors. Apple-labeled
memory is usually more expensive, and, as I said

before, there's no difference, other than price, between one company's RAM and another. So you probably want to avoid Apple-labeled memory unless it's competitively priced in your neighborhood.

Every issue of the major Mac magazines is filled with ads for RAM, accelerator upgrades, and large monitors. If you're considering an upgrade, it might be wise to contact a few of the different vendors and get brochures and prices.

Most memory upgrades come with complete installation instructions, for those of you who are inclined to install the memory yourselves. It's a relatively simple procedure. If you don't feel up to doing it yourself, any decent Apple technician should be able to do it for you in about half an hour.

Accelerators

What Accelerators Are

If you own a Mac II, IIx, IIcx, or SE/30, you can skip this section. Those computers are approximately as fast as an accelerated SE, Plus, 512, or 128. And, as of this writing, there is no true accelerator upgrade for the II (except for the Apple IIx upgrade, which is more desirable for the 1.4Mb floppy drive than for the small—around 15 percent—performance improvement it provides).

The 128K Mac, 512, 512Ke, Plus, and SE all have a Motorola MC68000 (that's a part number used to identify this particular chip) as their CPU. In its day, it was an extremely powerful chip.

It was soon superseded, however, by the faster, more powerful MC68020 used in the Mac II and the MC68030 used in the Mac IIx and SE/30. Apple has stated publicly that all future Macs will have the 68030 CPU (or a faster one).

When I speak of speed and power, I'm technically talking about a chip that does everything faster. It calculates faster, computes faster, can send and receive information faster, etc. An engineer or computer scientist could spend hours explaining the technological differences between chips. That's not what's important to me. As a user, a faster, more powerful processor is significant because it has tangible benefits: everything—launching, quitting, scrolling, screen refreshing, copying files and folders to and from disks, performing calculations and searches in

databases or spreadsheets, the Find command in any program that uses one, and just about everything else—happens faster when you use a more powerful CPU.

What Accelerators Do

An accelerator is a circuit board (that is, a card) that is placed inside your Mac and that uses a faster CPU than the one your Mac came with. With such a board installed, your Mac will run significantly faster.

Accelerator boards are relatively easy to install in SE and II-series Macs; they usually come with complete installation instructions. If you're timid about poking around inside your Mac, find a dealer or technician to do it for you. It should take less than an hour. If you're going to upgrade a Plus, 512K, or 512Ke, don't do it yourself unless you're extremely comfortable performing ultra-delicate surgery on your Mac. The older Macs have very little room for upgrades, and the lack of a slot makes installing one even tougher. Let it be someone else's headache—find a qualified technician to do it.

The number of variables in accelerator products is great. Some things to think about are discussed in the sections below.

A chart comparing a stock SE and II to a wide variety of accelerator products follows. You'll see for yourself that acceleration can speed up different operations as much as 1000 percent.

Clock Speed of the CPU Clock speed refers to the speed at which the CPU processes information internally. In addition to there being three different processors used in various Macintoshes, each CPU is capable of running at different clock speeds. Clock speed is measured in megahertz (MHz). Table 5–1 shows the clock speeds of stock Macintoshes.

Mac	Chip	Clock Speed
128, 512, 512Ke, Plus, SE	68000	7.8336MHz (commonly called 8MHz)
Mac II	68020	15.6672MHz (commonly called 16MHz)
Mac IIx, IIcx, SE/30	68030	15.6672MHz (commonly called 16MHz)

Table 5–1
Clock Speeds of Standard Macintoshes

Here's where it gets tricky: the chip versions used by Apple are not the only versions made by Motorola. Each chip also comes in a variety of other clock speeds.

For example, there are 16MHz and 25MHz versions of all the chips used by Apple. They are significantly faster than the versions Apple uses. There are even 33MHz versions of some, but they are extremely expensive and are rarely used. So why doesn't Apple use the fastest CPUs available? My best guess is price. Faster clock speeds mean higher prices.

A chip with a faster clock speed can provide significant performance improvements at a lower cost over a more powerful chip with a slower clock speed. For example, if you're starting with any of the Macs that came with a 68000, a 16MHz 68000 upgrade may provide almost as much speed as an 8MHz 68020 upgrade.

However, 68020-based upgrades come in various clock speeds too: some run at 16MHz and some at 25MHz.

Higher is faster. Faster is better. Better is more expensive. Get the picture?

Unfortunately, no 16MHz 68000 upgrades were tested for the chart later in the chapter. There are test results for both 16MHz and 25MHz 68020 upgrades, as well as a stock SE and II.

You can expect a 16MHz 68000 upgrade to perform somewhat more slowly than a 16MHz 68020 upgrade but much more quickly than a stock SE or Plus. These chips are a relatively inexpensive way to get a pretty impressive performance increase. As the price of the 68020 chip has dropped, the fast 68000 boards have become less common. By the time you read this, there may be no fast 68000 upgrades available; they may all have been replaced by 68020 upgrades in various configurations. Still, the clock speed issue also applies to 68020 and 68030 chips.

Use of Motherboard RAM Accelerators access RAM differently than a stock Mac does. Some accelerators come with high-speed RAM (that is, 80 or even 60ns RAM) installed on them; others come with none but allow you to install SIMMs of whatever speed you prefer. Still others won't accept any RAM; rather, they use whatever RAM your motherboard has. The fastest accelerators come with fast RAM on board. Of course, they're the most expensive. Shop around.

Math Coprocessors Most accelerator upgrades allow the optional addition of a math coprocessor—an MC68881 or 68882 chip. This is a chip designed to handle math tasks faster than they're presently handled by your CPU. With a math coprocessor installed, your CPU doesn't have to work as hard, and the math tasks it used to handle are directed to a custom chip designed especially for math.

I recommend getting the math chip—it speeds up more than just spreadsheets. In fact, it speeds up many programs you don't think of as math-based, such as CAD, drawing, and statistical analysis programs, as well as many other program that use floating-point math internally.

If a math coprocessor is offered as an option, consider it seriously. It shouldn't add more than 10–20 percent to the cost of the board, and it is probably worth it for the additional performance it provides.

Accelerators Compared

MACazine's November 1988 issue contained an excellent report on accelerators—thorough, comprehensive, and written in English, not computerese. Unfortunately, with publication of *MACazine* ceased, back issues may be hard to come by. Find a copy if you can. Table 5–2 is a copy of the article's chart comparing various SE accelerators.

	SE (stock)	II (stock)	Prodigy 16	Radius 16	Radius 25	Novy 16	Novy 25
CPU:	68000	68020	68020	68020	68020	68020	68020
Clock (MHz):	8	8	16	16	25	16	25
Coprocessor:	none	68881	68881	68881	68881	68881	68881
Time Required for Tests (in Seconds):							
MathView	1680	265	100	113	109	88	69
MacSpin	15	12	6.9	7.8	6.6	6.7	6.6
PageMaker	298	232	101	172	148	132	113
Trapeze	180	37	39	38.75	32	44	35.53
Excel	17	6	4	6	5	4	3
PowerDraw	13	6.6	4.9	7.7	5.5	5.3	4.9

Table 5–2 Speed Comparison of Different Accelerator Upgrades
Benchmark data courtesy of Steven Phillips, P.O. Box 833, West Jordan, UT 84084. Originally appeared in MACazine (November 1988).

The practical benchmarks used in testing these accelerator boards were chosen arbitrarily based on different software groups whose performance, we felt, would be enhanced enough by accelerators for the expense to be justified. The software packages were chosen without any *a priori* knowledge of how they would be affected by any given accelerator card. The software used was MathView from BrainPower, MacSpin from D2, PageMaker from Aldus, Trapeze 2.0 from Access Technology, Microsoft Excel, and PowerDraw version 2.0 from Computer Shoppe. We ran the following tests to try to give some indication what type of performance increase can be expected in normal operation.

The MathView test measured the time required to calculate the solution to an elliptical, partial differential equation, a procedure similar to those used in many scientific/engineering environments.

MacSpin was chosen for its CPU intensiveness. Rotating several hundred data points in real time requires heavy-duty number crunching. The specific test we performed was to measure the time needed to spin a sample data set 360 degrees. On the Mac II, we tried this test with the monitor in 16-color and 2-color modes. As expected, the 16-color mode slowed down the screen from 7 seconds to 45 seconds per rotation. Because MacSpin doesn't use any floating-point mathematics, it is unaffected when a 68881 coprocessor is installed.

PageMaker version 3.0 was used to represent the desktop publishing market; page layout is usually intensive enough to warrant paying for more equipment to increase productivity. Our test consisted of Auto-Flowing 71 pages of text and graphics in Word 3.2 format into a newly created (empty), 100-page PageMaker document. The time was measured from the moment the mouse was clicked to place the text until it was all placed on pages. PageMaker brings the whole document into RAM before placing it; this eliminates any possibility of hard disk factors influencing the results.

The Trapeze test measured the time required to invert an 11-by-11 matrix in a "spreadsheet" five times. Surprisingly, this test is integer controlled rather than using floating-point mathematics.

The Excel test measured the time to run an Excel macro for calculating amortization tables for a 30-year period. (This macro

was written at Savant Labs, where Steve Phillips was a partner. Savant was responsible for a number of excellent hardware and software reports for *MACazine*.) Even though the final results are in decimals, this test is also heavily dominated by integer math because of the way Excel deals with decimals.

The PowerDraw test was a measurement of the time required to redraw a somewhat complex drawing using the redraw command. These results were changed only slightly by the presence of a coprocessor.

Of course, many more tests, both standard and practical, could have been performed.

Who Will Benefit Most from an Accelerator?

Almost anyone who wants to be able to do more work in less time can benefit from accelerating their Macs. You'll be amazed at how much faster menus respond, applications and documents open and close, screens refresh, and files copy. Interestingly, accelerated Macs which have the 68000 processor in them (SEs and Pluses) can be faster than a Mac II, as the Table 5–2 clearly shows. Some of the 25MHz 68020-and new 68030-based boards may even outperform the IIx, IIcx, or SE/30. So if you own a Mac other than the II and want more speed, it may be cheaper to accelerate your existing machine than to buy a Mac II. Of course, with an accelerator and an SE or Plus, you don't get color, but if you don't have a real need for color, an accelerator upgrade is the most cost-effective means of gaining speed. And if you *do* need color, you might consider the SE/30. It has a slot to allow you to plug in a color video card and monitor, and it's the only small-sized Mac that has the correct ROM to work properly with 256 colors.

Is an Accelerator Worth the Cost?

Let's use the same analysis as we used earlier for RAM upgrades:

1. Look at Table 5–2 and make a rough determination of the time you'll save each day if you install an accelerator. You should save somewhere between 10 and 25 percent of the time you spend at the keyboard to make the investment pay off.

2. Determine the cost of the accelerator that you are considering.
3. Determine what your time is worth per minute.
4. Multiply the amount your time is worth per minute by the number of minutes you'll save each day (see step 1).
5. Divide the accelerator cost by the result of step 4 to determine how long it would take to pay back the cost of the accelerator.

So, if your time is worth $20 an hour ($0.33 a minute), the accelerator you're considering costs $1,400, and you figure you'll save 25 minutes a day, the upgrade will have paid for itself in 169 days:

```
$1,400 ÷ (0.33 dollars per minute * 25 minutes
per day) = 169 days
```

There is also the intangible benefit: the joy of having a faster, more responsive computer—one that displays the watch cursor for much shorter periods than ever before. How many times have you started something on your Mac, then waited impatiently while the watch cursor spun? The reduction in your frustration level is worth something. You might want to factor that into the equation somehow.

Which Accelerator to Buy

This is a very personal choice. You'll need to decide what your priorities are. If your budget is tight, you'll probably want to consider a 16MHz 68000-based upgrade. They generally cost less while still providing dramatic speed increases.

The 16MHz 68020 upgrades are probably the best compromise between price and performance. They're somewhat more expensive than 68000-based upgrades, but are significantly faster in most tasks.

If performance is more important to you than cost, you should look at 25MHz 68020 upgrades. By the time you read this, there will be even faster 68030-based upgrades available. If you can afford it, you should investigate one of these.

The average price for an accelerator is between $1,000 and $1,200. Some 16MHz 68000 upgrades can be found for under $500, and some of the new 68030 upgrades have prices in excess of $3,000.

As far as brands go, I've never owned an accelerator. Friends who have, and users on CompuServe, MacNet, and other on-line services report good experiences with Radius and Levco products. Both companies are known for innovative, well-engineered products with strong support. Like many major hardware products, accelerator upgrades are available primarily through dealers who sell and install a complete line of products. If you're comfortable installing the board yourself, or know someone who is, there are a number of mail-order vendors who advertise in the major Mac magazines. As with any mail-order product, be sure you're comfortable with the thought of long-distance service should the board become inoperable. If you aren't, find a good local dealer and buy it there.

Monitors

What Monitors Are

One of the biggest and longest-running complaints about the Mac has been the size of the screen. Although it's true that the 9-inch screens used in all of the Macs except the II series provide a crisper, cleaner image than the screens of most other computers, the fact remains that a 9-inch diagonal screen is too small to see a letter-size page without scrolling.

Fortunately, that complaint has been answered by Apple and independent developers. Today, you can buy a monitor of almost any size, shape, or color for almost any Mac.

Of course, to use a color monitor, you must have a Mac capable of handling color (a II, IIx, IIcx, or SE/30 as of this writing—I'm sure there will be more in the near future). Here's a list of your current monitor options:

If You Own a 128, 512K, 512Ke, or Plus These Macs can use only monochrome monitors, either single or dual-page. You can use only one monitor at a time, and you may not be able to use the built-in 9-inch Mac screen when an external monitor is connected.

The availability of monitors for Macs older than the Plus may be spotty.

If You Own an SE These Macs can use only monochrome monitors, either single- or dual-page. Monitors are easily installed; the video card goes in the SE slot. You can use only one monitor at a time, but most external monitors for the SE allow you to use the built-in 9-inch Mac screen even when the external monitor is connected.

If You Own a Mac II, IIx, or IIcx These Macs can use monochrome, gray scale, or color monitors of many sizes and shapes. You can have up to six monitors connected at any one time.

If You Own an SE/30 These Macs can use monochrome, gray scale, or color monitors. (The built-in screen is black and white, the same as always.) Many sizes and shapes of monitors are available. You can use only one monitor at a time, but most external monitors for the SE/30 should allow you to use the built-in 9-inch Mac screen even when the external monitor is connected.

External Monitor Components Macintosh external video systems are always made up of two pieces: the monitor itself and the video card that installs inside your Mac. The Apple Video Card is considered the industry standard and can be used with monitors from most vendors. Check the specifications of video boards carefully. Third-party (that is, non-Apple) vendors generally produce higher-performance video cards that include capabilities not found in the Apple card, such as custom chips to speed up screen refreshing.

What
Monitors
Do

A larger monitor will allow you to see one or more pages in their entirety without scrolling. Monitors come in various sizes, from the full- (or single-) page display, which allows you to view a full 8.5 x 11 inch page to 17-inch and 19-inch models that can easily show two pages side by side.

Even larger monitors are now available—Mitsubishi now makes a 50-inch color monitor for the Mac II, IIx, IIcx, and SE/30.

Another thing you might consider if you have one of the Macs that supports 256 colors (II, IIx, IIcx, or SE/30) is a color monitor. However, I don't recommend color unless you really

need color capacity (and I mean unless you have a *serious* reason—like preparing color separations with programs such as Illustrator '88 or working with gray scale TIFF files with programs such as ImageStudio and Digital Darkroom).

Color monitors and video boards are much more expensive than their monochrome counterparts. Not only that, using color slows down a Mac considerably. I've heard many people say that the speed at which your screen refreshes on a color Mac in the 2-color (that is, black and white) mode can be 2–4 times faster than in the 256-color mode. I've noticed it myself on my Mac II, which has an Apple Color Monitor and video card. It runs noticeably faster in the 2-color mode than in the 256-color mode.

So, even though my Mac is capable of displaying glorious colors, most days you'll find me running in the black-and-white (2-color) mode for improved performance.

Who Will Benefit Most from External Monitors?

The more you scroll around the screen, the more sense a larger monitor will make for you. When I first started out on the Mac, I used PageMaker on my stock Mac Plus and its 9-inch screen. It was annoying seeing only a portion of the page on which I was working. I was constantly changing views or dragging the page around with the grabber hand. It was more than a year before I was able to afford my first large-screen monitor. When I finally upgraded, I looked at everything available and then selected the Radius Full Page (black and white) Display for my Mac Plus. I was amazed at how much time I saved on each project. Scrolling around a complicated page was painfully slow on my Plus, so the fact that I did much less scrolling with my large screen was a real time-saver for me.

Though this is completely subjective, it seems that my projects looked better, and more professional, after I got the Radius. Another thing I found was that I printed things out less frequently once I was able to view the whole page on screen. The time I saved not having to print pages to see how they looked at full size was worth the price of the monitor. Being able to view a full page (or more) on the screen is something you can't understand until you've lived with it for a while. Once you have, you'll never want to work on a 9-inch screen again.

If you do any kind of graphics work, design, or layout, a large screen will make a world of difference in the way you work. If you are involved in page-layout work, you'll be surprised at how pleasant working on a full page (or more) is.

The benefits of a larger monitor aren't limited to people who use Macs for page layout. If you use your Mac for large spreadsheet models, you'll find a big-screen monitor beneficial, as will anyone who regularly works on graphics larger than the built-in Mac screen.

MultiFinder users will also benefit greatly from the increased screen size. Because MultiFinder allows you to keep several applications open, you'll find a larger screen helps you keep more windows visible. This can be a great time-saver when you're cutting and pasting or switching between programs.

Are External Monitors Worth the Cost?

Once again, let's use our cost-analysis formula:

1. Establish how much time you would save each day if you didn't have to scroll or print as often.
2. Determine the cost of the monitor you're considering.
3. Determine what your time is worth per minute.
4. Multiply the amount your time is worth per minute by what your time is worth per minute times the number of minutes you'll save each day (see step 1).
5. Divide the monitor cost by the result of step 4 to determine how long it would take to pay back the cost of the monitor.

So, if your time is worth $20 an hour ($0.33 a minute), the monitor you're considering costs $1,000 (about the least you can pay for a large screen), and you figure you'll save 15 minutes a day, the monitor will have paid for itself in 202 days:

```
$1,000 ÷ (0.33 dollars per minute * 15 minutes
per day) = 202 days
```

Again, there is an intangible benefit: your work will probably look better when you're able to compose it on a bigger screen.

Like accelerating your Mac, adding a larger monitor will reduce your frustration level. And, you'll find yourself printing fewer documents, making the purchase of a large screen even more attractive.

Which Monitor to Buy

The cost of a larger monitor has dropped dramatically since I bought my Radius several years ago. Whereas I paid about $2,000 for it, single-page displays are available today for less than $1,000. I've used that Radius Full Page Display for more than eighteen months, and it's performed beautifully. I recommend Radius products without hesitation.

I have had good experiences with SuperMac. Both Radius and SuperMac are Macintosh-only developers and have reputations for well-made products. I've always had reliable products and good service when I've dealt with either of them.

In addition to my Radius, *MACazine*'s offices had a pair of 19-inch monitors made by MegaGraphics. Their image isn't as sharp as that of the Radius and they've required service calls where the Radius hasn't. So if you're considering this brand, be sure to compare it to a Radius. I think you'll notice a difference.

You're going to spend a lot of time staring into your monitor, so be sure you make a selection you can live with. Perhaps more than for any other component, you should arrange to spend some time with the monitor you're planning to buy before you buy it. Hang out at dealers, user groups, and friend's offices and homes—anywhere you might see an external monitor in action. Examine the image near the edges of the screen closely. If there's noticeable distortion, that's probably not a screen you want. Also pay particular attention to whether the image on the screen looks smaller than the same image on the 9-inch Mac screen. Some monitors reduce the image as much as 15 percent, so that 9-point type on the large screen will appear about the same size as 8-point type on a built-in 9-inch monitor. Pay particular attention to the sharpness of small text characters near the edges and corners of the screen. Another thing to look for is noticeable flickering. There shouldn't be any. If it appears to flicker, look for another monitor.

Finally, whichever brand of monitor you choose, make sure it's easily serviced. Buy from a dealer whenever possible. Mail-order monitors may save you a few dollars, but if you have to return it to the factory for service and pay the freight, you may wish you had bought from a local dealer. Also, a dealer is more likely to have a loaner unit in stock. A monitor is about as reliable as a television set—that is, if it works for a few days, it will probably give you years of trouble-free service. Still, if you need to send a monitor back for repair, be prepared to wait several weeks for its return.

One last thing; don't place the monitor directly on top of the Mac II case unless you use a monitor stand. Two bad things happen when you place the monitor right on the case. First, you can get interference on the screen. Second, you can block the air vents on the top of the II. If you must have your monitor sitting on your Mac II, get a monitor stand made specifically for that. Ergotron and Kensington make a variety of monitor stands for screens of all sizes.

Recommendations

A variety of RAM chips, accelerator boards, and external monitors is available. A complete listing of the products I recommend follows:

RAM

Microtech International, Inc.
29 Business Park Drive
Branford, CT 06405
800–626–4276
Call for pricing

Microtech is one of the largest sellers of RAM and also makes a complete line of hard disks and tape drives.

Dove Computer Corporation
>1200 N. 23rd Street
>Wilmington, NC 28405
>800–622–7627
>919–763–7918
>Call for pricing

Dove is another large supplier of RAM upgrades for the Macintosh. The company also makes a line of accelerators.

Dove products are sold only through dealers—you cannot purchase direct from Dove. Call for the dealer nearest you.

Accelerators **Radius**
>1210 Fortune Drive
>San Jose, CA 95131
>408–434–1010
>Accelerator products from approximately $1,000 to $2,200

Radius is one of the most popular developers of Macintosh accelerators and displays. Started several years ago by a bunch of guys who worked on the design of the original Mac, the company has established an excellent reputation as one of the most reliable suppliers of innovative, well-engineered products.

Radius products are sold only through dealers—you cannot purchase direct. Call for the dealer nearest you.

Levco
>6181 Cornerstone Court East, Suite 101
>San Diego, CA 92121
>619–457–2011
>Accelerator products from approximately $1,500 to $3,100

Levco is another company known for innovative products and attention to detail. They introduced a 68020 upgrade more than a year before the Mac II was announced, and they have done some of the most impressive work in ultra-high-speed transputer technology (which gives supercomputer-like power to the Mac).

Levco products can be purchased from Levco dealers, or direct from Levco.

DayStar Digital

5556 Atlanta Highway
Flowery Branch, GA 30542
800–962–2077
404–967–2077
Accelerator products from approximately $900 to $6,000

DayStar is a manufacturer of high-performance accelerator products that specializes in cutting-edge technology. They were one of the first to ship a 68030 accelerator.

Daystar products can be purchased from Daystar dealers or direct from Daystar.

Irwin Magnetics

2101 Commonwealth Boulevard
Ann Arbor, MI 48105
313–930–9000
Accelerator products from approximately $500 to $1,700

Irwin has a line of competitively priced, high-performance accelerator and monitor products.

Irwin products are sold only through dealers—you cannot purchase direct. Call for the dealer nearest you.

Dove Computer Corporation

1200 N. 23rd Street
Wilmington, NC 28405
800–622–7627
919–763–7918
68020 and 68030 accelerators from approximately $900 to $2,000

Dove products are sold only through dealers—you cannot purchase direct from Dove. Call for the dealer nearest you.

SuperMac Technology

485 Potrero Avenue
Sunnyvale, CA 94086
408–245–2202
SpeedCard 68020 Accelerator: approximately $400 (approximately $700 w/68881 math chip)

SuperMac is another popular developer of Macintosh accelerators and displays. The SpeedCard is one of the lowest-priced 68020 upgrades around, though it performs as well as many more expensive products.

SuperMac products are sold only through dealers—you cannot purchase direct. Call for the dealer nearest you.

Monitors

Radius

1210 Fortune Drive
San Jose, CA 95131
408–434–1010

Black and white, gray scale, and color video cards and monitors. Complete systems are priced from approximately $1,600 to about $6,000.

As I said before, Radius has an excellent reputation as one of the most reliable suppliers of innovative, well-engineered products. I have extensive experience with their monitors and recommend them highly.

Radius products are sold only through dealers—you cannot purchase direct. Call for the dealer nearest you.

SuperMac Technology

485 Potrero Avenue
Sunnyvale, CA 94086
408–245–2202

Black and white, gray scale and color video cards and monitors. Complete systems are priced from approximately $2,200 to about $6,000.

SuperMac specializes in display systems for the Mac. They are one of the most popular manufacturers of Macintosh monitors, with an extremely complete selection of display products.

SuperMac products are sold only through dealers—you cannot purchase direct. Call for the dealer nearest you.

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
408-996-1010
High Resolution Monochrome Monitor: approximately $400
High Resolution Color RGB Monitor: approximately $1,000
Two-Page Monochrome Monitor: approximately $2,100
Portrait Display: approximately $1,100
Video card: approximately $500
Video Expansion Kit (allows 256 Colors): approximately $150

Apple monitors are a surprisingly good value. Priced competitively, they perform as well, or better than most of the other monitors on the market. You should definitely consider one if you've got a Mac II, IIx , IIcx, or SE/30.

Apple products are sold only through authorized Apple dealers—you cannot purchase direct from Apple.

Irwin Magnetics
2101 Commonwealth Boulevard
Ann Arbor, MI 48105
313-930-9000

19-inch Monochrome Monitor: approximately $2,000 (includes video card)

Irwin products are sold only through dealers—you cannot purchase direct from Irwin.

Monitor
Stands

Ergotron, Incorporated
3450 Yankee Drive, Suite 100
Eagan, MN 55121
612-452-8135
From approximately $90

Ergotron makes a wide variety of monitor stands, CPU stands, and security products.

Kensington Microware
   251 Park Avenue South
   New York, N.Y. 10010
   800-535–4242
   212-475–5200
   From approximately $50

Kensington is the largest manufacturer of Macintosh accessories, including CPU stands, surge protectors, antiglare filters and input devices.

Summary

If you typically use many applications in the course of a day, you should consider upgrading your machine's RAM and utilizing MultiFinder.

If you feel your machine is sluggish when opening and closing documents, scrolling, redrawing the screen, or copying files, you should consider an accelerator.

If you find yourself scrolling around your documents a lot each day, you will probably benefit from a larger monitor.

These hardware solutions are not mutually exclusive. If your budget allows, you might want to consider more than one. An accelerator along with a RAM upgrade will yield a machine that's not only fast, but is capable of running multiple applications simultaneously. That particular combination is possible on any Mac.

A large-screen monitor added to the mix will not only allow you to see an entire page in most applications without scrolling but also will also let you easily see multiple windows in the Finder. If you have a Plus or SE, however, you may not be able to have all of these things at the same time. Some manufacturers make products that will allow this configuration on a Plus or SE, but if this combination is what you want, check first that it's possible to install everything in your particular Mac.

6

Utility Software

The power user's best friend.

Utilities separate the serious computer user from the amateur. Utility software owes its usefulness to the computer—a utility would be meaningless without a computer to run it on.

A word processor is not a utility, because its functionality can be duplicated by pencil and paper or a typewriter. A spreadsheet isn't a utility either; its functions mimic the calculator, adding machine, or accountant's worksheet. Graphics programs are also not utilities; they replicate artists' tools.

Utilities aren't designed to emulate something that can be done without the computer; they are programs designed solely to make your computing experience more productive. They are programs that relate only to using a computer.

The backup programs discussed in Chapter 4, the file-and disk-recovery programs in Chapter 2, and programs like Suitcase II and MasterJuggler are utilities. Without a computer there would be no need for them. Each of the products in this chapter fits this bill: from Finder replacements to macro generators, they make sense only if you own and use a Mac.

Over the past few years I've discovered that utilities make life at the computer better and more fulfilling. They save time and effort. I've assembled quite an arsenal of utility software, and I assure you, my collection of utilities makes using my Mac easier and faster. I'd hate to be without them.

This chapter is organized in two sections, followed by my "Recommendations" and "Summary" sections. The first section, "The Essential Utilities," covers the programs I wouldn't dream of being without. The second section, "The Best of the Rest," deals with other utilities that are useful, but more a matter of personal preference.

I really do love my utilities—the ones described in this chapter are the tools I use every day to make the time I spend at my Mac more productive. In this chapter I'll tell you everything you need to know about the ones I recommend.

The Essential Utilities

DiskTop

DiskTop, a multifunction desk accessory from CE Software, may be the most indispensable of utilities. It has most of the functions of the Finder and much, much more. Because it's a DA, you can use it without quitting whatever you're doing. DiskTop is one utility I recommend for almost everybody.

It's an incredible time-saver. From the DiskTop DA you can:

- Move, copy, rename, or delete files or folders
- Launch programs or documents without quitting to the Finder
- Get information on the size and number of files or folders
- Erase, eject, or unmount disks
- Create new folders
- Search for files using many more options than Apple's Find File

Figure 6–1 shows DiskTop's main window. You can copy, move, delete, rename, find, and get information on sizes with the click of a button. All of the buttons have Command-key equivalents (Figure 6–2), so you need don't have to use the mouse if you don't care to.

Name	Type	Creator	Data	Resource	Modified
Navigator.ð^®ß			1K		11/30/88
NewCIS	12 files/folders		---	---	12/1/88
PostScript Glossary	GLOS	MSWD	4K		1/31/87
QM Demo 12/2/88	STAK	WILD	192K	28K	12/2/88
Redux 1.01	APPL	Redx		159K	5/25/88
Stacks	9 files/folders		---	---	11/27/88
Standard Glossary	GLOS	MSWD	6K		6/19/88
STAX! Stack	STAK	WILD	184K	35K	12/3/88
SuperPnt2	7 files/folders		---	---	11/14/88
System Folder	87 files/folders		---	---	12/3/88
TED Spread	GWKS	GLAS	32K	1K	10/7/88
Telcom	8 files/folders		---	---	9/6/88

Figure 6–1
The DiskTop Main Window

Figure 6–2
The DiskTop Menu
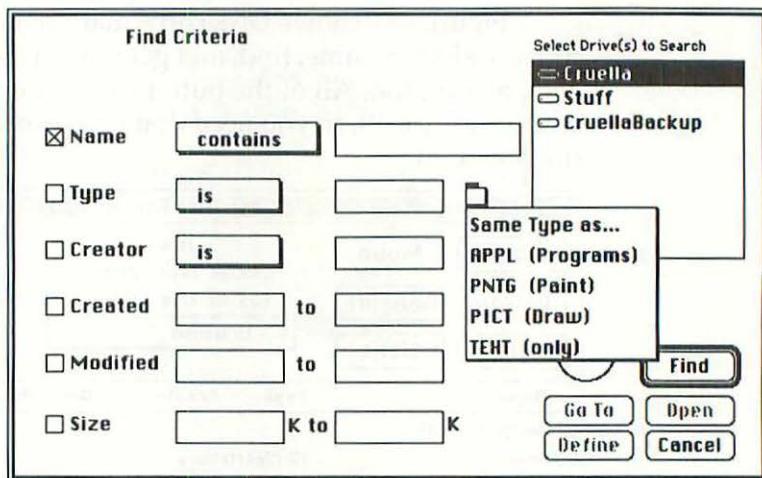
Figure 6–3
DiskTop's Find
Dialog Box

Figure 6–3 illustrates one of DiskTop's most powerful features, an incredibly flexible file-finding function. You can use any or all of the criteria—file name, type, creator, creation date, modification date, or size—whenever you search for a file or files.

DiskTop comes in handy dozens of times each day. Here are just a few ways it will save you time:

- You can delete unneeded files from any disk at any time. This is particularly handy when you try to save a file and encounter a message that says "not enough space on the disk."

- You can launch any document or application from wherever you are. So, if you're working in your word processor and decide you want to work in a graphics program, you can launch it without quitting to the Finder first. DiskTop will politely ask if you want to save any unsaved files before it quits. If you're running under MultiFinder, DiskTop will just launch the application or document without quitting what you're doing.

- You can copy files from one disk to another, or even one folder to another, without quitting the application you're using. This can be particularly handy when disks are almost full and you don't want to quit what

you're doing to free up additional disk space. You can use DiskTop to copy some unneeded files to another disk, then delete them from the disk that's almost full.

- You can see how much space a file or folder takes up, or how much space remains on a disk. This will help you to know when you're running out of disk space before it happens. (See the previous point.)

- You can search for a file or folder using many options not provided in Apple's Find File DA. Searches can be by Name, Type, Creator, Date created, Date modified, Size, or any combination of these attributes. I've got more than a thousand files on my hard disk. I can't always remember the folder into which I stuffed that letter I wrote nine months ago. DiskTop's flexible search options let me find it faster than with any other program.

- You can Shut Down your computer from the DiskTop menu. This saves you a trip back to the Finder at the end of a session, and DiskTop will take care of closing any open applications or documents. It will politely ask if you want to save any unsaved files before it shuts down.

Even MultiFinder users, who can use the Finder at any time without quitting an application, will find DiskTop a time-saver because, unlike the Finder, DiskTop has many keyboard shortcuts for selecting and acting on files, folders, and disks.

Those keyboard shortcuts are a big part of what makes DiskTop so convenient for me. I hate to say it, because the mouse is part of what makes using a Macintosh special, but reaching for the mouse is one of the biggest bottlenecks to faster computing. One of the Finder's biggest drawbacks is the fact that most actions can be performed only with the mouse. Almost every function in DiskTop is accessible from the keyboard—applications, files, and folders can be opened, moved, copied, or deleted without your having to touch the mouse. Even files that are nested six folders deep become easy to find and open using DiskTop.

The DiskTop package includes two bonus programs—Widgets and LaserStatus. Widgets is another multifunction program that lets you:

- Create start-up screens, allowing you choose a picture to replace that boring "Welcome to Macintosh" dialog box you see on start-up.
- Change PICT files into paint files, so files created in MacDraw or other program capable of saving files in the PICT format can be modified using MacPaint or other programs capable of reading files saved in the paint format.
- Print thumbnails on a laser printer—this feature lets you print up to 16 miniature MacPaint documents on a single page.
- Change the size of the System heap. The System heap is a special area of RAM set aside for things like fonts and DAs. Increasing its size will help you if you have a large number of fonts and DAs.

   If you ever see an error message with the number -108, it probably means you need more space in your System heap. Be careful, though; you'll reduce the amount of RAM available to the System, Finder, and applications by the amount you increase the System heap. So if you increase the size of the System heap by 16K, you'll have 16K less RAM available for other tasks.

- Customize paper sizes for the ImageWriter. If you have a need for custom paper (such as invoices, note-sized paper, etc.), Widgets can create a custom paper size for your ImageWriter, allowing you to select that size from Page Setup thereafter.

LaserStatus, the other bonus program included with Disk-Top, provides tools for keeping track of what the laser printer is doing. You can:

- Monitor printer use from your Mac. LaserStatus tells you if the printer is busy, and if so, who's using it. Great on networks that share a laser printer.
- Reset the printer, which is like restarting your Mac; it clears out RAM and lets the printer start out fresh (your laser printer has RAM too, you know). Laser-

Status can also tell you how much printer memory is being used and how much is available.

- Examine the fonts installed in your laser printer, which will tell you which fonts are built into the printer as well as what downloadable fonts are presently in the printer's memory (RAM).

- Disable the annoying start-up page. Most laser printers, when started, print a start-up page telling you some basic information about your printer. This practice wastes both time and paper. Fortunately, LaserStatus allows you to turn the start-up page on or off at will.

All three products—DiskTop, Widgets, and LaserStatus—have even more features than I've been able to describe in this small space. At about $50, DiskTop is the best utility value around. CE Software is an excellent company that is known for maintaining their products well, frequently offering reasonably priced or free upgrades. They also have terrific technical support by phone or on CompuServe or MacNet.

Macro Utility programs

Macro programs, sometimes known as *keystroke recorders*, allow you to record the keystrokes involved in repetitive tasks, enabling you to recall them later with a single keystroke. Even mouse movements and clicks can be recorded for later playback with a single keystroke. This can be an incredible time-saver.

Each of the macro utilities discussed is an INIT or CDEV, so they're a breeze to install. Just place the file in your System Folder and reboot.

Macros are great for tasks you perform frequently. I have macros set up for everything. With just one keystroke I can:

- Launch frequently used applications.
- Launch frequently used desk accessories.
- Play back frequently typed text, such as an address:
MACazine
8008 Shoal Creek Boulevard
Austin, TX 78758

or my name and title:

Robert A. LeVitus

Editor-in-Chief

- Insert today's date in any program.
- Use the scroll bars without touching the mouse.
- Add Command-key equivalents to menu options in programs that don't provide them, or change existing Command-key equivalents to a combination you prefer. Don't you hate programs that don't Print when you press Command-P? *Apple Human Interface Guidelines: The Apple Desktop Interface,* which is the "bible" software developers are supposed to adhere to, says the following Command-key combinations "...should be used only for the operations listed below and should never be used for any other purpose":

Apple menu:

Command-?   Help

File menu:

Command-N   New

Command-O   Open

Command-S   Save

Command-Q   Quit

Edit menu:

Command-Z   Undo

Command-X   Cut

Command-C   Copy

Command-V   Paste

Interrupting an operation:

Command-period (Command-.) is used to stop the current operation before it completes.

Interestingly, the book suggests that Command-P be used for Plain Text, not print (though it does allow Command-P for other uses if there is no Plain Text menu selection). In the real world, though, almost all developers have adopted Command-P as the command for printing.

If all developers followed these rules, every application would use the combinations listed on the previous page. Unfortunately, more than a few software developers appear not to have heard of them.

With a macro program such as QuicKeys (more about that later), even if the developer used the wrong Command-key short-cut, you can override it with any key combination you like. Now, every application I use will print when I type Command-P, quit when I type Command-Q, etc., regardless of whether the developer followed Apple's recommendations.

A macro program can automate almost anything you do on your Mac. Have a custom size for your newsletter? Create a macro to select Page Setup from the menu and fill in each of the custom dimensions. You'll never do it manually again.

When I want to compose a letter, I use a macro (created with QuicKeys) that, with a single keystroke:

- Changes the font from Geneva, the default font (that is, the font the program uses when it first opens if you don't select a specific font), to Courier. I prefer Geneva for composing articles and books, and Courier for correspondence.
- Changes the line spacing from the default of 2, which I prefer for books and articles, to 1.5, which I prefer for letters.
- Types seven carriage returns, types the date, types two more carriage returns, then types the word "Dear" and places the cursor one space after the "r" so I can begin my letter.

Power users love macros. Macros make repetitive tasks into "no-brainers." You don't have to worry about your typing; macros play back perfectly every time, provided you created them properly. You don't have to remember the date. You don't have to remember custom page sizes. Macros let you customize your Mac in ways you never realized were possible.

Hint: If you like macros as much as I do, you might want to consider an extended keyboard—one with additional function keys numbered 1 through 15. Using various combinations of the Command, Option, Control, and Shift keys as modifiers, the numbered function keys can control more than 100 macros.

Another reason to consider an extended keyboard is that most have an additional key, called the Control key, which is a modifier key, like the Command and Option keys. The Control key can be used in combination with any other key to play back macros. For example, Microsoft Word uses almost every Command and Option key combination for something. Using the Control key for my macros in Word insures that I don't use a Command or Option key combination that is already in use by Word.

The advantage of the Control key is that very few programs use it. Thus, you rarely run the risk of assigning a macro to a key that does something in a program.

There's very little reason not to use a macro utility. They're inexpensive (all are under $150), they don't affect your Mac's performance in any way (at least in any way which might be perceived as negative), they use only a small amount of RAM (typically under 100K), and they save a lot of time.

QuicKeys CE Software, which also makes the highly recommended DiskTop, is the publisher of QuicKeys, the finest macro product around. As far as I'm concerned, it's the easiest to use, and the easiest to get into the habit of using. It's another utility I'd never want to be without.

Using QuicKeys, with one keystroke I can:

- Insert text—up to 71 characters.
- Launch frequently used applications, desk accessories, or even documents.
- Select any menu item in any application.
- Click and drag in predetermined sequences. For example, I have a macro that clicks on a floppy disk icon in the Finder and drags it to the Trash, which ejects the disk and also dismounts it. I prefer this to Command-E (eject) or Command-Shift 1 or 2, because neither of those methods dismount the disk. All they do is eject it, leaving its grayed-out icon on the desktop.
- Use the scroll bars without touching the mouse.
- Restart or shut down the Mac.
- Create sequences that may include any/all of the above.

QuicKeys has an easy-to-use interface that you call up with a single user-defined keystroke. Or, you can select QuicKeys from the Control Panel. In either case, you use the interface only to actually create and assign a key to a macro. After that, the macro plays when you press the appropriate keystroke, without your having to bring up the QuicKeys interface.

In Figure 6–4, you can see that I'm about to set Control-Right Arrow as the keystroke combination to play back this Macro. Once I've done this, pressing Control-Right Arrow will have the same effect as clicking the mouse in the right arrow in a vertical scroll box—known in QuicKeys as a "Column Right."

Once you've opened QuicKeys, you simply select the kind of action you want to record, perform it, then assign it a keystroke combination for playback. You can have universal macros, which play back in any application as well as in the Finder, or you can have application-or Finder-specific macros, which take effect only when you're using a particular application or when you're at the Finder's desktop.
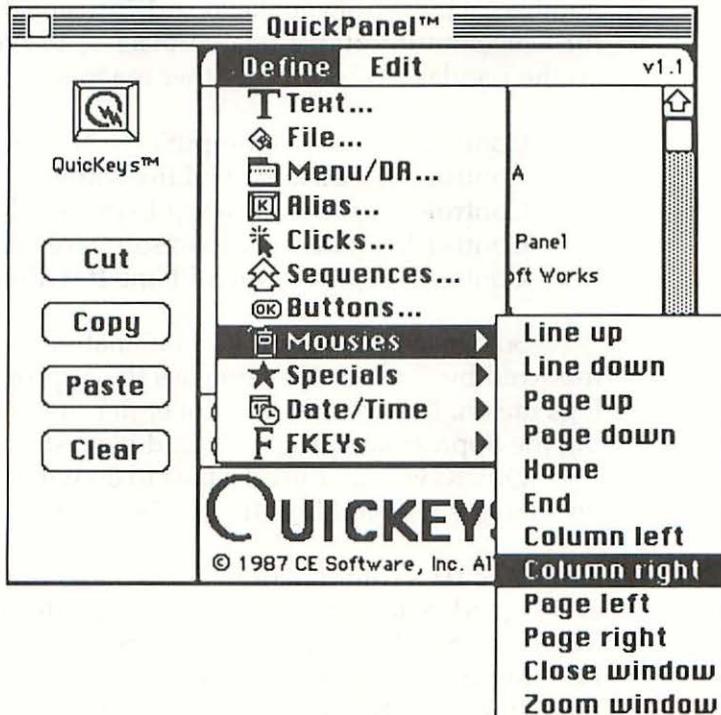
Figure 6–4
QuicKeys
Interface

For example, I have set up application-specific QuicKeys in all of my telecommunications programs so that Control-G logs me on. (Control-G for "Go." I always think of telecommunications programs as going out on the telephone lines and getting stuff. So the mnemonic device of using Control-G makes sense to me. Use whatever makes sense to you.) No matter which program I use, if I type Control-G, it will dial the proper phone number and type out my account number. Without fail. All I have to remember is to type Control-G once I've opened my telecommunications program.

I have a lot of telecommunications programs—on any given day, I may use CompuServe Navigator, AppleLink, MacNet, MicroPhone II for GEnie, and Desktop Express for MCI Mail. Each connects automatically when I type Control-G. To make things even easier, the programs are launched with combinations of the Control key and numerical key pad numbers. I prefer using the key pad numbers for this set of related macros because QuicKeys considers the numbers on the key pad to be different than the numbers at the top of your keyboard. By using the key pad numbers for telecommunications-related macros, I save the numbers 1–0 on the regular keyboard for other macros:

> Control-Keypad 1: CompuServe Navigator (CompuServe)
> Control-Keypad 2: AppleLink software (AppleLink)
> Control-Keypad 3: Desktop Express (MCI Mail)
> Control-Keypad 4: MacNet software (MacNet)
> Control-Keypad 5: MicroPhone II (GEnie)

So two simple keystroke combinations—Control-Keypad #, followed by Control-G—launches the appropriate program and logs me on. Believe me, it's a lot easier than finding and launching the appropriate programs, and it's faster too.

QuicKeys is a utility I'd hate to do without. I've trained it to do so many useful things that I'd be lost without it.

AutoMac III AutoMac III, from Genesis Micro Software, is another good macro program that is worth mentioning because Microsoft bundled a copy with version 3.0 of Word and 2.0 of File throughout 1988 and 1989. It can also be purchased separately for about $80. If you own a recent version of Word or File,

you probably have a copy. If you do, it's well worth using.

AutoMac isn't quite as easy to use as QuicKeys and lacks some of that program's built-in functions of QuicKeys (auto-date, column left, right, up, down, etc.). However, AutoMac is a powerful, capable program. Before QuicKeys was released, I used it regularly.

If you like to tinker, AutoMac includes a script editor, which allows you to modify macros using a powerful-text based language.

Tempo II Tempo, from Affinity Microsystems, is the most ambitious, powerful, and expensive macro program. It is worth mentioning because it's the only macro program that offers conditional branching. This feature allows you to build macros that include custom dialog boxes for the user to respond to (yes, no, cancel, etc.). The program will execute the appropriate macro depending on the user's choice. This is also the only macro program that can compare a value to the Clipboard. This function is extremely helpful in a spreadsheet or database. You can create a macro to select a cell or field, copy it (to place it on the clipboard), then compare it to another value using six different comparisons: less than, greater than, equal to, not equal to, less than or equal to, or greater than or equal to. You can then branch to a different macro depending on the result of the comparison.

The price for this power, aside from the higher list price (approximately $150) is that Tempo is more complicated than the other programs. In addition, it's more likely to cause a conflict with something else. If your operating environment is complicated, and you use a lot of INITs and CDEVs, Tempo may not operate properly. Still, Tempo has many satisfied users, and it is the only choice for certain macro tasks.

MacroMaker Worth mentioning because it's free from Apple, MacroMaker is included with System software 6.0 or higher. It's the least powerful of the three other macro programs mentioned here, and it's saddled with a clumsy interface that tries to mimic a tape recorder. MacroMaker lacks many of the advanced features, such as branching and special commands (date, column left, user-definable dialog boxes, etc.), that make QuicKeys, Tempo, and AutoMac III so powerful. Go ahead and check it out, but

when you get serious about macros, get a copy of QuicKeys.

MacroMaker is known to conflict with Microsoft Works and may also conflict with other programs.

Font/DA Extending Utilities

For many System software revisions, Apple has imposed a limit of 15 desk accessories and 52 fonts on the System. Even worse, the Apple-imposed system forces you to use Font/DA Mover to install any font or DA *before* you want to use it. This means, if you play by their rules, you can have only 52 fonts and 15 DAs installed, and you need to know which fonts or DAs you're going to use before you start working in an application.

This situation led to the invention of font and DA extending utilities like Suitcase II and MasterJuggler. With either of these programs, you can use as many fonts or DAs as you like without installing them in your System in advance. Both Suitcase II and MasterJuggler are INITs, for easy installation.

If the file of fonts and/or DAs containing the font or DA you want to use is on a mounted disk, you can open and use it on the fly—without quitting what you're doing and without using Font/DA Mover. Font suitcases (so called because of the way the icon looks—see Figure 6–5) have the letter "A" on them; DA suitcases have a little grid. (Interesting trivia: the grid on the DA icon is meant to represent the Puzzle DA that is part of Apple System Software releases.)
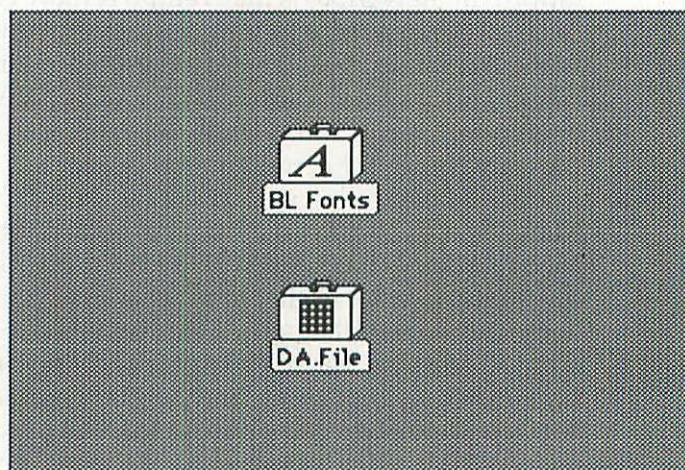
Figure 6–5
"Suitcase" Files
Containing Fonts
and Desk
Accessories

Both MasterJuggler and Suitcase II offer these features:

- They give you access to hundreds of fonts and DAs, as
  well as FKEYs and sounds, without your having to use
  Font/DA Mover or ResEdit to install them in your
  System.

- They compress screen fonts so that they take up less
  disk space.

- They provide utilities for resolving font-numbering
  conflicts.

- They allow you to view fonts in their actual faces.
  Figure 6–6 shows MasterJuggler's implementation;
  Suitcase II has a similar feature.

You can't believe how useful these utilities are. Font/DA
Mover and the whole concept of installing fonts and DAs in your
System file is archaic. Font and DA extenders like MasterJuggler
or Suitcase II are such naturals, you'll wonder why Apple didn't
include them in the System software.
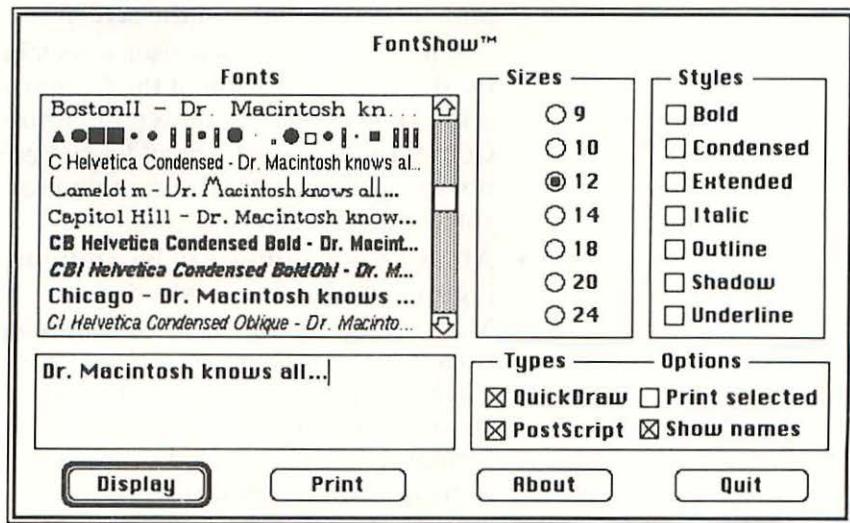
Figure 6–6
MasterJuggler's
FontShow

Avoiding the use of Font/DA Mover and being able to use any font or DA at any time is reason enough to buy one of these utilities. However, the other functions (compressing fonts to save disk space, resolving font conflicts, viewing fonts in their actual faces, etc.) are equally useful.

If you use more than a few fonts or DAs, you have a definite need for one of these utilities.

MasterJuggler MasterJuggler, from ALSoft, is known as the "Swiss Army knife" of utility software. In addition to the functions it shares with Suitcase II (see the previous section), MasterJuggler provides a number of useful features *not* found in Suitcase II. These include:

- A sound manager that allows you to assign different sounds to specific System events such as Startup, Shutdown, Insert Disk, Launch Application, etc. Each event can have a distinctive sound.

- A set of pop-up lists, which allow you to launch programs, documents or desk accessories from handy pop-up menus. In Figure 6–7 you can see that I've configured MasterJuggler to include all of my frequently used applications and documents. To pop up the list, I hold down the Command, Option, and Control keys and click anywhere on the screen.

  The choice of keys is user-selectable; I could have used any combination of the Command, Shift, Option, and Control keys, as shown in Figure 6–8. I selected Command-Option-Control-Click because I know I'm not using that particular combination with any other software.

- Almost every option can be configured by the user. Figure 6–8 shows my selections of "hot-keys" for MasterJuggler. On my Mac, Command-Shift-K brings up a list of applications; Command-Option-Control-Click will pop up a similar list wherever I click, as shown in Figure 6–7. Both lists contain the same applications, which I installed previously; installing applications is a simple procedure.

Other pop-up lists include FKEYs, fonts, DAs, and sounds. You select the hot-keys to call up each list, and forever after, your lists will be available with a single keystroke.

✓ =Word
Canvas™ 2.0
Finder

=Word	▶	Backup Chapter
AppleLink		Basics Chapter
Canvas™ 2.0		File and Disk Recovery Chapter
Courier 1.9b3		Hard Disk Chapter
Cricket Graph		Introduction Chapter
Desktop Express		Other Hardware Chapter
EzTape® 1.10		Other Power Users
Full Impact™		Printers and Printing Chapter
Globe		Telecommunication Chapter
HyperCard	▶	template
Jasmine DriveWare™		Utility Software
MacDraw II		
MicroPhone II™	▶	
Navigator	▶	
PageMaker 3.01		
PixelPaint 1.1		
Studio/8		

Figure 6–7
MasterJuggler's
Pop-up Application
and Document
Launcher

Options

Hot Keys™

MJ DA	
Appl list	⌘ – Shift – k
DA list	⌘ – k
Font list	
FKey list	⌘ – Ctrl – k
Sound list	⌘ – Opt – k
FontShow	⌘ – Opt – Ctrl – k
HotSounds	
KeyChains	
ResConflicts	
Bypass	Shift
MJ pop-up	Inactive
Appl pop-up	⌘-option-control-click
Wnd pop-up	⌘-control-click

General Options

☒ Show icon at startup
☒ Load in system heap at start
☐ Wait for floppy disk mount
☐ Ignore unfound files at start
☒ Install sound play
☐ Show all file types in DA
☒ Quicksort font menus
☒ Use last font list settings
☒ Warn on font file close
☒ Remember current default dir
☒ Show documents in pop-up

[Okay]   [Cancel]

Figure 6–8
MasterJuggler
Allows the User to
Select the Hot-
Keys" Used

Suitcase II Although Suitcase II, from Fifth Generation Systems, is a solid performer, it has fewer features than MasterJuggler. As you can see in Figure 6–9, both products allow access to unlimited fonts, DAs, FKEYs, and sounds, and they both provide utilities for resolving font conflicts, and presenting your fonts as they'll appear on screen (Figure 6–10). Only MasterJuggler, however, offers the convenient pop-up lists and sound-managing features. Although Suitcase II is slightly less expensive (about $60 compared to about $90 for MasterJuggler), I think you get more for your money with MasterJuggler.

Some people prefer Suitcase II; others prefer MasterJuggler. One good reason for selecting Suitcase II over MasterJuggler is that Suitcase II takes up only 39K of disk space, whereas, MasterJuggler takes 209K. If you don't have a hard disk or have limited disk space available, you'll probably prefer Suitcase II. Otherwise, MasterJuggler is a collection of utilities that will save you time and effort dozens of times a day.
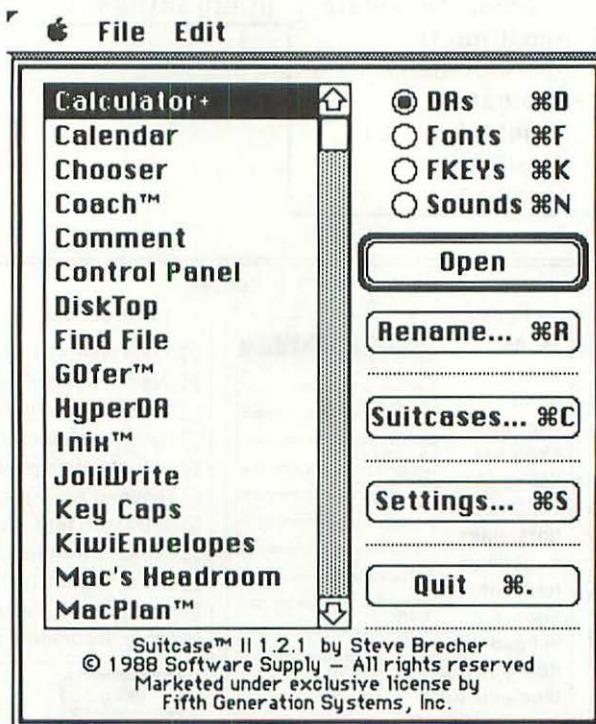
Figure 6–9
Suitcase II Allows
You Access to
Unlimited Fonts,
DAs, FKEYs, and
Sounds

Format | **Font** | **Document** | **Window** | **Work** | ✓

Avant Garde*
Bookman‡
Chicago
✓Courier*
Geneva
Helvetica*
Monaco
Palatino*
Times*

9 Point
10 Point
✓**12 Point**
14 Point
18 Point

e Chapter 6

you to ... d fonts, DAs,
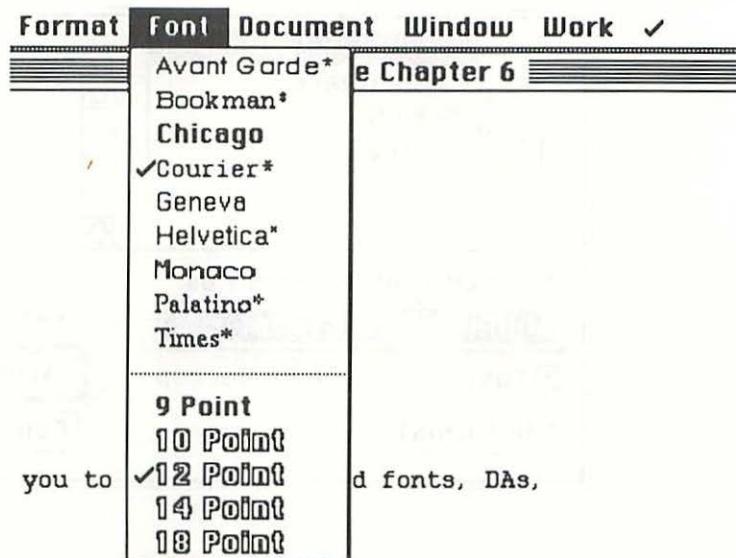
Figure 6–10
Suitcase II Also
Displays Fonts in
Menus as They
Look on Screen

HFS Navigator

HFS Navigator, from Think Technology, is a handy little add-on that soups up your standard GetFile and PutFile dialog boxes by adding a list of your 12 most frequently visited folders. Adding folders to the list is as easy as selecting them in the GetFile or PutFile dialog.

Figure 6–11 shows a Save As (PutFile) dialog box without HFS Navigator; Figure 6–12 shows the same dialog box after installing HFS Navigator (HFS Navigator uses a simple installer program). Just double-click the icon, select the System file in which you want to install HFS Navigator, then click the O.K. button.)

Notice that, once you've installed HFS Navigator, instead of containing the folders listed in the desktop hierarchy, as shown in Figure 6–11, the list contains your most frequently used folders, as shown in Figure 6–12.

If you find yourself frequently traveling up and down the hierarchy of folders in GetFile or PutFile dialog boxes, HFS Navigator will help you get to the proper folder quickly. It's simple and elegant.

To override HFS Navigator, just hold down the option key when you click on the current folder in the Save or Open dialog box.
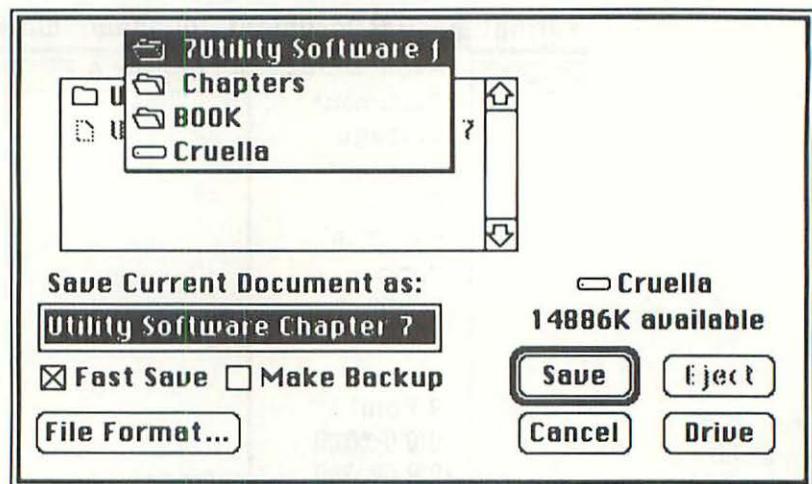
Figure 6–11
A Standard PutFile
Dialog Box
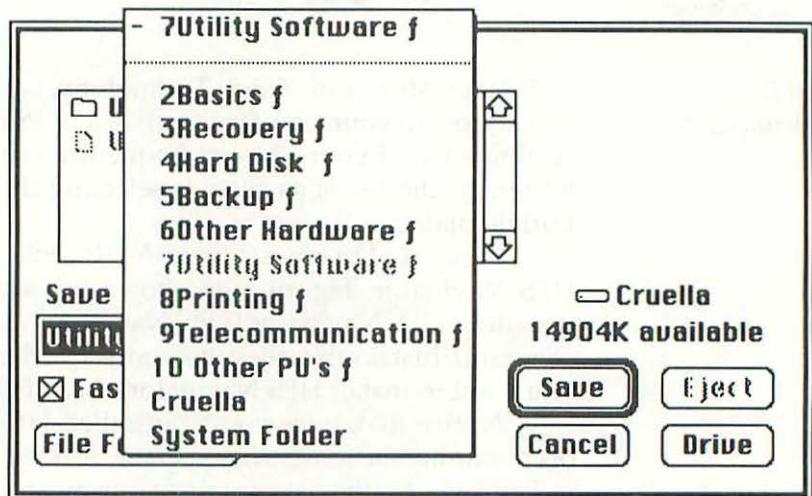
Figure 6–12
A Standard PutFile
Dialog Box After
HFS Navigator Has
Been Installed

There are even some hidden features, which you reveal by pressing the Command key when you click on the current folder, as shown in Figure 6–13. The three additional features are:

- The ability to create and name a folder before you Save
- A Find File function that allows you to search for files or folders by name without closing the GetFile or PutFile dialog box

> • A Get Info function that tells you the file's size and the last time it was modified.

I like HFS Navigator a lot. Like DiskTop, QuicKeys, and MasterJuggler, it's invaluable; I wouldn't want to be without it.
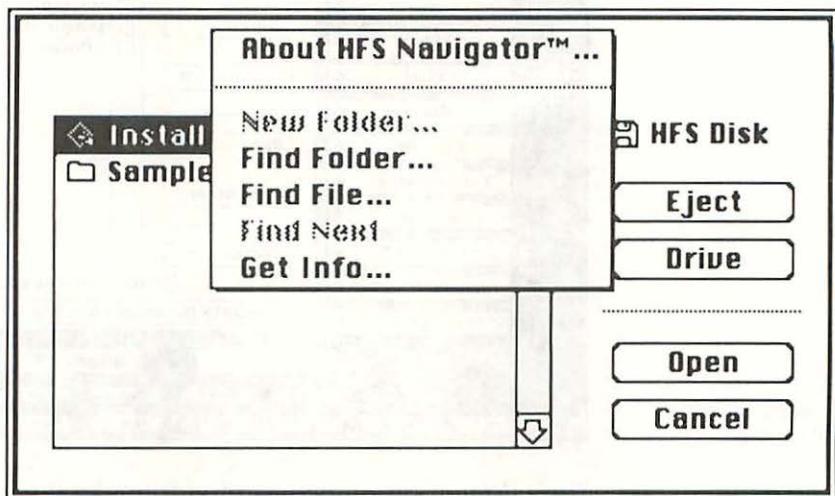
Figure 6–13
HFS Navigator's
Additional
Features

Those are the "essential" utilities; DiskTop, QuicKeys (or another macro program), MasterJuggler (or Suitcase II), and HFS Navigator. These are utilities almost everyone will benefit from—a Mac without them is under-powered. But there are dozens of other utilities which you might find useful. The next section takes a look at the best of the rest.

The Best of the Rest (Other Utilities)

PowerStation

PowerStation, like Suitcase II, is published by Fifth Generation Systems. It is a "Finder replacement." Once installed, it replaces the Finder with its own desktop.

Figure 6–14 shows PowerStation configured to offer me a choice of five documents created by Canvas 2.0 (a popular drawing application) when I select the Canvas 2.0 box. To select this box, I just type the first few letters ("c-a-n") on the keyboard or click the Canvas 2.0 box with the mouse.
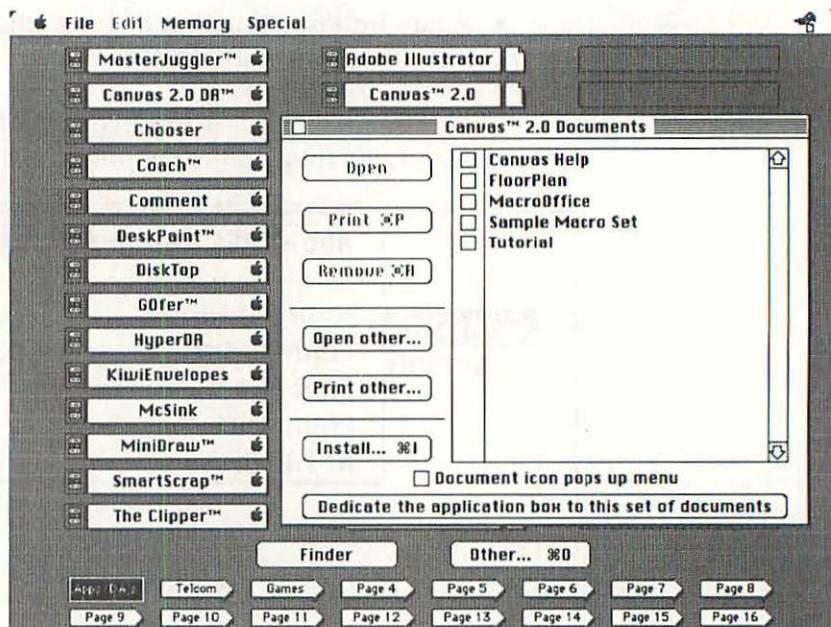
Figure 6–14
PowerStation's
Interface

PowerStation is designed to make it easy to find and open frequently used documents, DAs, and applications. I like using it for a number of reasons:

- You can make your selection from the keyboard—just type the first few letters of any box on the page and that box will become highlighted. Pressing the Return key launches the application, DA, or document, or, if you've set it up to do so, brings up a dialog box of documents for you to select from (as shown in Figure 6–14.) Clicking the mouse on a box has the same effect.

- You can return to the Finder easily by clicking the Finder button or pressing the Enter key.

- PowerStation is extremely useful with my large hard disks. It makes it easy for me to manage thousands of files and folders. Many users swear by it. If you use PowerStation in combination with DiskTop, you may never use the Finder again.

OnCue

OnCue, from Icom Simulations, is a file-launching utility. It is used to:

- Launch frequently used applications or documents
- Switch between applications in MultiFinder with a single click of the mouse
- Open any application or document, even ones rarely used

OnCue is an INIT. Once installed, it appears as a little icon in the upper right corner of the menu bar. Clicking the icon will drop down a menu, as shown in Figure 6–15.

To add applications or documents to the menu, simply select Configure from the OnCue menu. This brings up a dialog box that allows you to easily add the applications and documents you like (Figure 6–16).

Once you've configured OnCue, you select the applications or documents you've installed by clicking the OnCue icon or using a user-definable modifier key/click combination to summon a pop-up menu, as I use the Command-Option-Control-Click combination to invoke the pop-up menu in MasterJuggler.

Special

Chapters	✓ Finder
	DAs
	Other...
	Adobe Illustrator 88™ 1.6
	Canvas™ 2.0
	HyperCard
	MORE II™
Other...	Word ▶
Basics Chapter 1	
File and Disk Recovery Chapter2	Configure...
Hard Disk Chapter3	Preferences...
Introduction Chapter	
	About On Cue...

CruellaBackup
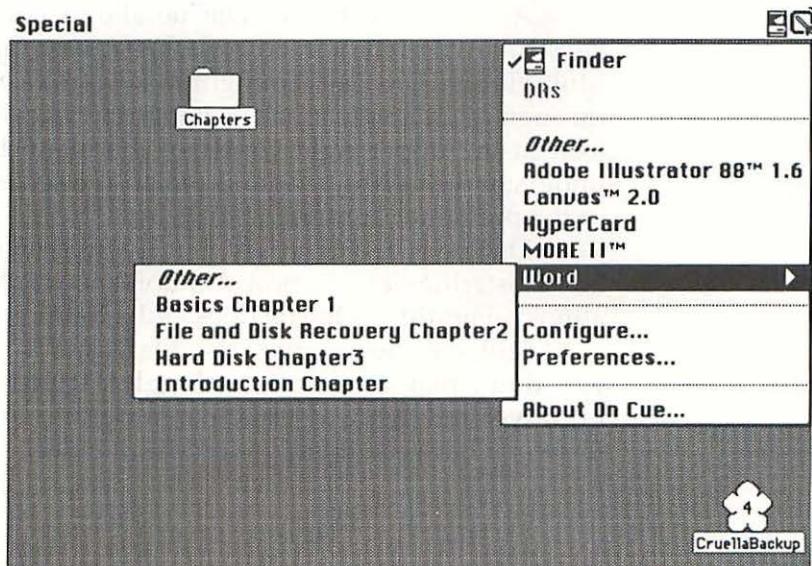
Figure 6–15
OnCue Presents a
Pop-up List of
Applications and
Documents
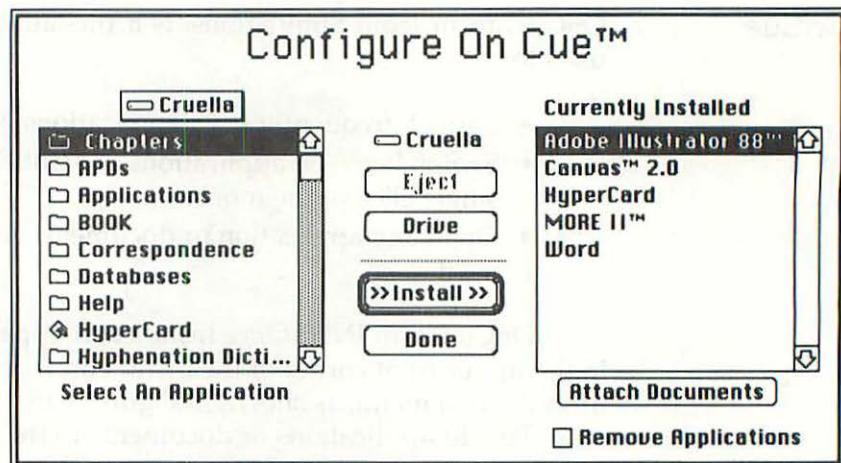
Figure 6–16
Configuring
OnCue

You can even launch an uninstalled application or document (that is, one you didn't include when you configured On-Cue). Just select Other from the OnCue menu and you will be presented with a standard GetFile dialog box that allows you to open even documents and applications that weren't installed when you configured the program.

As an added bonus, OnCue allows you to select a single keystroke combination to switch between applications under MultiFinder. This user-configured keystroke combination cycles through open applications as you do by clicking the application icon in the upper right corner of the menu bar. (If you didn't understand that, go back and reread the section on MultiFinder in the previous chapter.)

OnCue is a slick utility, but if you own or are planning to buy MasterJuggler, you probably don't need it. MasterJuggler does almost everything OnCue does and a lot more.

Still, OnCue has many avid fans and is well worth using if you don't plan to get MasterJuggler. It provides an excellent, intuitive, and fast way to launch programs and documents and to switch between them under MultiFinder.

SmartScrap/
The Clipper

If you use graphics, these are a pair of Scrapbook and Clipboard enhancement utilities you're going to love. SmartScrap and The Clipper, from Solutions International, are packaged together, so you get two incredible desk accessories for the price of one (approximately $80).

SmartScrap is a Scrapbook replacement that reads and writes standard Scrapbook files but that has some significant advantages. It can read your old Scrapbook files without any modification and is one of the most trouble-free desk accessories I own. Because it works almost exactly like the Scrapbook DA, it's incredibly easy to learn and use. If you currently use the Apple Scrapbook DA, SmartScrap is going to knock you out. Here are a few of the ways it improves on the Apple Scrapbook:

- SmartScrap has a pictorial table of contents (Figure 6–17); the Apple Scrapbook DA doesn't. This makes it simple to find images when you use SmartScrap. The Apple Scrapbook forces you to look at one page at a time, and it can only move pages sequentially. SmartScrap allows you to jump directly to any image by simply double-clicking it.
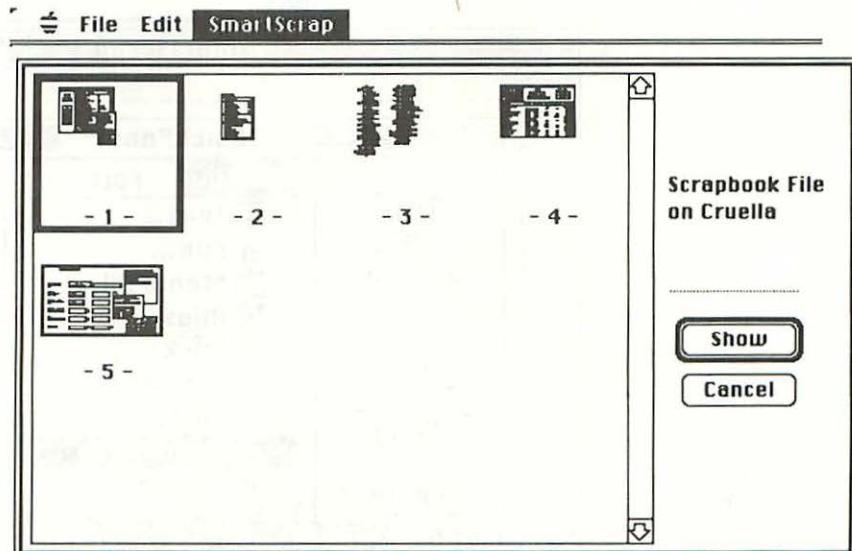
Figure 6–17
SmartScrap's
Table of Contents

- SmartScrap has horizontal and vertical scroll bars (Figure 6–18); the Apple Scrapbook has none. Without scroll bars, you can view only part of the image.
- SmartScrap has a selection rectangle (Figure 6–18); the Apple Scrapbook doesn't. This selection rectangle lets you easily select any part of an image while the Apple Scrapbook allows you to copy only an entire page.
- SmartScrap lets you create and rename multiple Scrapbook files; the Apple Scrapbook lets you create only one, and it must be named "Scrapbook File."
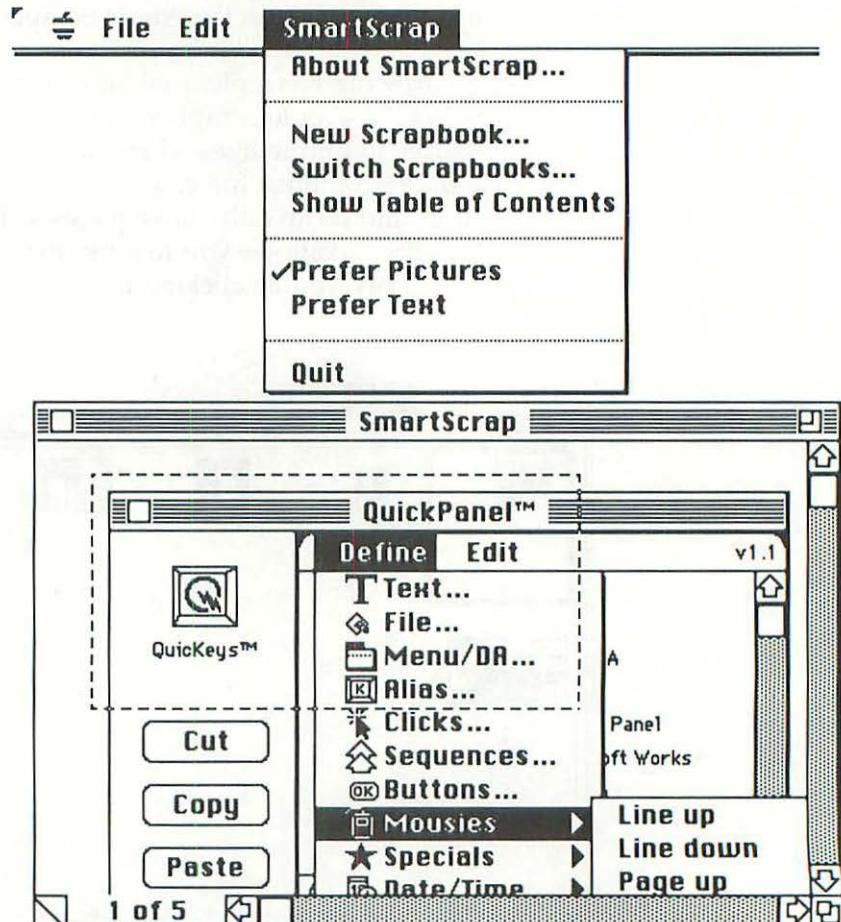
Figure 6–18
SmartScrap has
Scroll Bars and a
Selection
Rectangle

The Clipper, which is the other half of this dynamic duo of
desk accessories, is just what the doctor ordered if you've ever
needed to scale or crop an image, particularly in a program that
doesn't have this feature.

The Clipper is a tool for cropping and scaling images. It's
easy to use; simply Copy any image to the clipboard, select The
Clipper from the DA menu, and Paste. Once you've pasted your
graphic into The Clipper, you can show or hide its contents. If
you hide the contents, The Clipper becomes transparent. That means
you can see through it to your application (remember, The Clip-
per is a DA), which allows you to resize the Clipper window while
looking through it at your application. In Figure 6–19, the Clip-
per contents are showing (that is, not hidden.)

Once you've pasted a graphic image into The Clipper, you
can scale or trim it in many ways. If you use the Scale… or Trim…
menu selections, you can specify scale or trim percentages nu-
merically via a dialog box. Or, you can resize the window and
select Scale To Fit or Trim to Fit, which will scale or trim your
image to the exact size of the window.

Using the Scale or Trim to Fit commands in conjunction with
the Hide Contents feature allows you to resize the window the
usual way, by dragging the little box in the lower right corner of
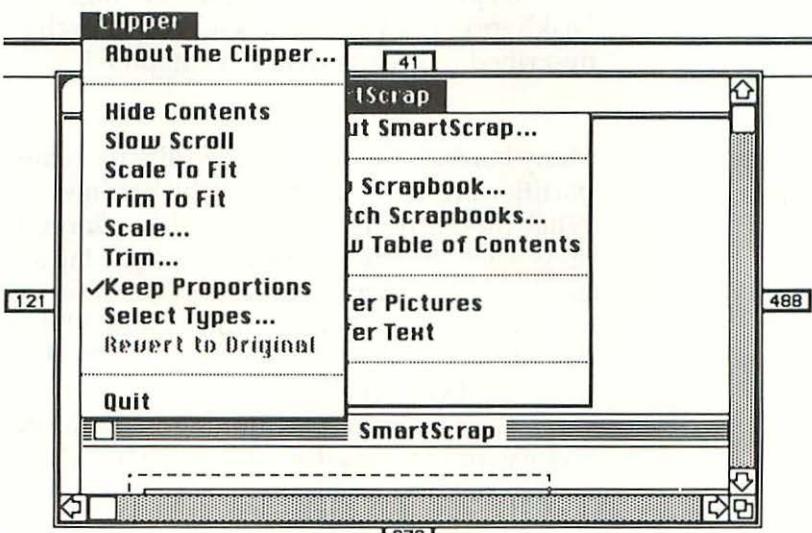
Figure 6–19
The Clipper Lets
You Scale or Trim
Graphic Images

The Clipper's window, while looking through the transparent Clipper window. Because the contents are hidden, you can see right through The Clipper to your document, which makes it easy to adjust the window to just the right size. Fiddle with the window until it's exactly the size you want your graphic to be. Then, select Scale or Trim to Fit. Once you're satisfied with the resized image, just Copy it and close the Clipper. Now you're ready to Paste the image into any application you choose.

The Clipper is an ideal tool for resizing bit-mapped images using the magic laser printer scaling percentages discussed in the next chapter, "About Printers and Printing."

Desktop publishers will love The Clipper's ability to scale a graphic to the precise dimensions of open space in the publication. If you ever copy and paste graphic images, The Clipper will be a helpful addition to your bag of tricks.

DiskExpress

DiskExpress, from ALSoft (the same people who make Master-Juggler), is a utility for defragmenting disks, particularly hard disks. Defragmenting is a procedure that rewrites files on your disk so they occupy contiguous sectors. Fragmented files take longer to access, so if you're serious about performance, you'll want to use DiskExpress regularly. I run it about once a month.

Depending on the degree of fragmentation on your disk, DiskExpress can speed disk access enough for you to notice. It is described in greater detail in Chapter 3.

Partitioning Utilities

Many hard disks come with a utility to create *partitions*, and many partitioning utilities are sold by commercial software vendors. What these programs do is divide a large hard disk into partitions, each of which appears to your Mac as a smaller hard disk. In Figure 6–20, you can see my Jasmine 100, which I've partitioned into two volumes: Stuff (about 20Mb) and CruellaBackup (about 80Mb). I use the larger partition to back up my 80Mb internal hard disk, Cruella.

The benefit of partitioning is more speed; desktop and directory files are smaller, so you don't wait as long when quitting, saving, or copying files.
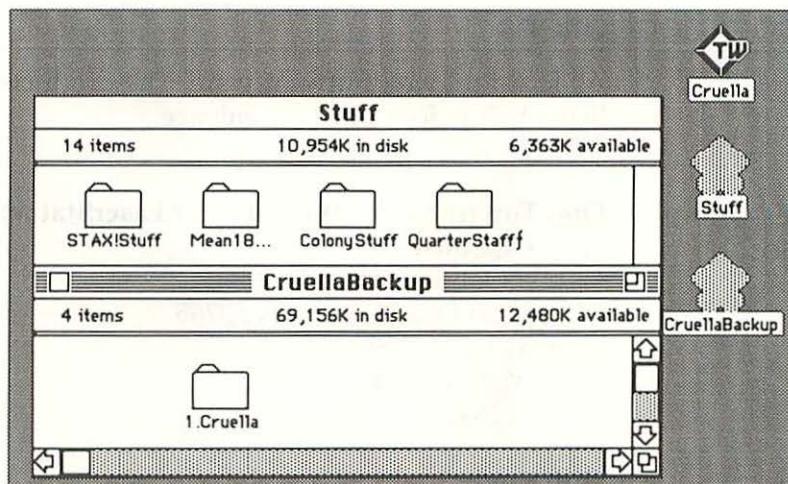
Figure 6–20
My Jasmine 100
Hard Drive,
Displaying Its Two
Partitions

I don't usually partition my hard disks; I partitioned the Jasmine only to find out how reliable their partitions and drive were. The answer is: Very good so far—after 3 months of continuous use. Still, I don't recommend partitioning your hard disk unless it is 100Mb or larger or contains more than 1000 files. Partitioning a hard disk adds another level of complexity to file storage. There's more to go wrong and more possibilities for problems with mounting partitions or corrupting directories. Unless you've got a strong reason for needing partitions, don't bother with them.

Switch-A-Roo

Switch-A-Roo, written by ace programmer Billy Steinberg, is an FKEY that allows Mac II users to toggle between two different monitor configurations—say a 2-color configuration and a 256-color configuration—with one keystroke. If you have a Mac II, you'll love not having to make a trip to the Control Panel every time a program wants to be run in black and white (some programs are not designed to work in color and will refuse to run in the color mode). Switch-A-Roo does not affect the color setting you choose in the Control Panel. After you have used Switch-A-Roo to select a different mode, when you reboot, your Mac will start up in whichever color mode you selected in the Control Panel.

Switch-A-Roo is freeware, so you can pick up a copy from most of the on-line services, on-line bulletin boards, or user groups.

Recommendations

As I said, I love utility software. The products I recommend are listed below for your convenience.

The Essential
Utilities

DiskTop (includes Widgets and LaserStatus)
  CE Software
  P.O. Box 65580
  West Des Moines, IA 50265
  515–224–1995
  Approximately $50
  512Ke, Plus, SE, II, IIx, SE/30

QuicKeys
  CE Software
  P.O. Box 65580
  West Des Moines, IA 50265
  515–224–1995
  Approximately $100
  512Ke, Plus, SE, II, IIx, SE/30
  Requires System 4.1 or later

AutoMac III
  Genesis Micro Software
  17124 N.E. 8th Place
  Bellevue, WA 98008
  206–747–8512
  Approximately $80
  Requires System 4.1 or later
  512K, 512Ke, Plus, SE, II, IIx, SE/30

Tempo II
  Affinity Microsystems
  1050 Walnut Street, Suite 425
  Boulder, CO 80302
  303–442–4840
  Plus, SE, II, IIx, SE/30
  Requires System 4.1 or later
  Approximately $150

MacroMaker
> Part of Apple System Software Updates

Shrink-wrapped package with disks and printed documentation is available only from Authorized Apple Dealers for approximately $50. See the recommendations section in Chapter 1 for a list of ways to get the System software without documentation from user groups, on-line services, and some Apple dealers.

MasterJuggler
> ALSoft
> P.O. Box 927
> Spring, TX 77383
> 713–353–4090
> Approximately $90
> 512Ke, Plus, SE, II, IIx, SE/30
> Requires System 5.0 or later

Suitcase II
> Fifth Generation Systems
> 11200 Industriplex Boulevard
> Baton Rouge, LA 70809
> 504–291–7221
> Approximately $80
> 512Ke, Plus, SE, II, IIx, SE/30
> Requires System 4.1 or later

HFS Navigator
> Symantec Corporation
> 10201 Torre Avenue
> Cupertino, CA 95014
> 408–253–9600
> 512K, 512Ke, Plus, SE, II, IIx, SE/30
> Requires System 4.1 or later

Just before we went to press with this book, Symantec announced that HFS Navigator was being discontinued as a stand-alone product, and will probably be included in the next release of SUM, version 2.0, which is scheduled for release in mid–1989.

The Best of
the Rest

PowerStation
Fifth Generation Systems
11200 Industriplex Boulevard
Baton Rouge, LA 70809
504–291–7221
Approximately $60
512Ke, Plus, SE, II, IIx, SE/30
Requires System 4.1 or later

OnCue
Icom Simulations
648 S. Wheeling Road
Wheeling, IL 60090
312–520–4440
Approximately $60
512K, 512Ke, Plus, SE, II, IIx, SE/30

SmartScrap/The Clipper
Solutions International
30 Commerce Street
Williston, VT 05495
802–658–5506
Approximately $90
Plus, SE, II, IIx, SE/30
Requires System 6.0 or later

DiskExpress
ALSoft
P.O. Box 927
Spring, TX 77383
713–353–4090
Approximately $70
Lisa/XL, 512K, 512Ke, Plus, SE, II, IIx, SE/30

Switch-A-Roo
Freeware.
Available from user groups or on-line services

Summary

By all means, get yourself copies of QuicKeys and DiskTop. They are two of the most effective productivity-enhancing utilities on the market. I just can't recommend them highly enough. If you use more than a few fonts or DAs, or want the ability to easily choose between available sets of them, get MasterJuggler or Suitcase II. To make using your hard disk easier, consider getting HFS Navigator.

If you work with a lot of graphics, SmartScrap and The Clipper are worth checking out.

There are always new utilities coming out—better backup utilities, better Finder replacements, better everything. Keep your eye on the Mac magazines for reviews or cruise the on-line services for power user recommendations. Chapter 8 contains further information on telecommunications and on-line services.

Oh, and one last thing; be careful when you begin using a utility for the first time, especially if it's an INIT like QuicKeys, MasterJuggler, Suitcase II or OnCue. Make sure you've got a reliable backup of any start-up disk on which you plan to install a new utility. In some cases, your new INIT may not get along with other programs (usually other INITs) on your hard disk. If you add an INIT and have trouble rebooting, see the section on resolving INIT conflicts in Chapter 2 "File and Disk Recovery."

7

About Printers and Printing

Tips and hints for getting the best results,
no matter which printer you use.

*Using the Macintosh to manipulate images and text on screen is a breeze.
It would seem that getting those images and text to appear on paper
exactly as they look on screen would be simple. After all, we've got
WYSIWYG technologies—what you see is what you get, isn't it?*

*The answer is "sometimes." Depending on the printer and the
software, what you see on the screen is not always what you get on the
printed page. This chapter will give you some practical tips, hints and
warnings about getting the best results (that is, improving printing
speed and the look of your printed material), no matter which printer
you're using.*

The chapter begins with some observations on printing in general. Next, there are specific sections dealing with the three most popular printers, ImageWriter, LaserWriter, and Linotronic LaserImageSetter, followed by the now familiar "Recommendations" and "Summary" sections.

About Printing in General

There are a few tips that apply to any printer. Perhaps the most useful is that typing Command-. (Command-Period) will abort most printing jobs.

It's a good idea to select the printer you'll be using before you begin work, using the Chooser desk accessory. If you always use the same printer, never changing it using the Chooser, you need to do this only once. If you switch between two or more printers, you should begin your session by selecting the printer you'll be using.

Then, each time you use a program, the first thing to do when you start a new document is to use the Page Setup command (usually found in the File menu) in your software to check page size and print area. Using the Page Setup command before beginning your work helps some software understand which printer you'll be using to print your document.

The way your printouts will look will vary depending on the printer you use. The chief distinction between printers is resolution. The higher the resolution, the sharper and clearer characters and graphics will appear on the printed page.

Resolution is measured in dots per inch (*dpi*). An ImageWriter II will provide what is commonly called "near-letter-quality" output at 144 dpi in its best mode, as long as a font twice the size of every font used in the document is installed. (The section on ImageWriters later in the chapter has complete details of why this occurs.) An ImageWriter LQ provides "letter quality" at 216 dpi. Laser printers are "better-than-letter-quality," sometimes called "near-typeset" quality, at 300 dpi. Don't be fooled by the terminology. If you want a document to look typeset, you'll have to use the Linotronic 300, which produces "true-typeset-quality" pages at 2,540 dpi on paper or negative film.

The Linotronic (and other very high resolution imagesetters) are not really printers at all; rather, they are sophisticated type-setting machines capable of printing documents created on the Macintosh. It's unlikely you or your company will own one—they start at more than $30,000. Fortunately, there are service shops all over the country where you can bring your disk and have it output at very high resolution for about $10 a page. Look in the Yellow Pages under "Typesetting" to locate one near you. (Again, the section on Linotronics later in the chapter has a complete discussion of using the Mac for typesetting.)

Select the
Proper
Printer for
the Job

Casual correspondence or invoices may look fine printed on a dot matrix printer, but a newsletter printed on an ImageWriter will always have a sloppy, amateurish look. At the very least, a LaserWriter should be used. If you don't own a laser printer, there's probably a service bureau in your city that will let you print documents on their laser printer for a small charge per page. Many quick print shops now have this capability; AlphaGraphics is one of the largest chains to offer it.

If your budget allows, output from the Linotronic is even more professional looking than from the LaserWriter. Almost anything you plan to have printed professionally is probably worth typesetting on a Lino.

ImageWriters and Tips for Using Them

ImageWriters are dot matrix printers. That means the image is placed on the page by an array of wires (pins) that strike a ribbon, producing dots. The ImageWriter II, with a 9-pin print head, is capable of 144 dpi in its "Best" mode, whereas the ImageWriter LQ, which has 27 pins, prints 216 dpi in its "Best" mode.

ImageWriter printers are most often used for printing correspondence and business forms. The ImageWriter LQ is particularly flexible in handling forms and envelopes. Now, let's move on to specific tips for using these printers.

Getting the
Best Results

The first thing you need to know in order to get the best results from your ImageWriter is how to get good-quality text to print. In most programs, when you specify "Best" from the Print dialog box, the Mac searches through your installed fonts, looking for:

- a font 2 times the size of each font used in the document (ImageWriter, ImageWriter II)

or

- a font 3 times the size of each font used in the document (ImageWriter LQ)

The Mac looks for the sizes above because it can scale them better than other sizes. (A more complete discussion of scaling bitmaps appears later in the chapter under the heading "Magic Laser Printer Scaling Percentages.")

Screen fonts are bitmaps, just like graphics created with MacPaint. That means they are a collection of dots on the screen, 72 to the inch, arranged to look like letters and numbers.

If the size you selected isn't installed, your Mac will attempt to scale another size of that font. The results can be unappealing unless it finds an installed size it can accurately scale (that is, one two or three times the size of the one used in your document, depending on your printer).

For your convenience, installed screen font sizes always appear in outlined letters in the menu, as shown in Figure 7–1. So, in this illustration, you can see that I've got Geneva 9-and 12-point fonts installed. If I wanted to print a document in Geneva 12 at the highest resolution possible on an ImageWriter, I would have to install Geneva 24.

Here's another example:

If your document used Helvetica 12 point and Times 10 point, for "Best" quality printing, you need to have:

- Helvetica 12 and 24 and Times 10 and 20 screen fonts installed (ImageWriter, ImageWriter II)

or

- Helvetica 12 and 36 and Times 10 and 30 screen fonts installed (ImageWriter LQ)

```
┌─────────────┐
│ ▐ Font ▌    │
├─────────────┤
│ Chicago     │
│ Courier     │
│ ✓Geneva     │
│ Monaco      │
│ ............│
│ 9 Point     │
│ 10 Point    │
│ ✓12 Point   │
│ 14 Point    │
│ 18 Point    │
└─────────────┘
```
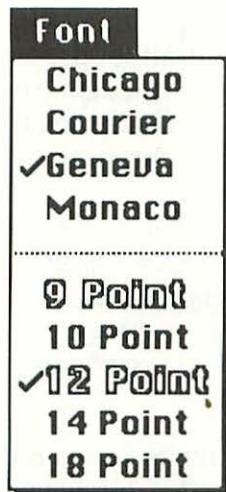
Figure 7-1
Installed Font Sizes
Always Appear in
Outlined Letters

If you don't have those sizes installed, get them and install them (you can use Suitcase II or MasterJuggler). It will make a big difference in the way your "Best" quality printing comes out. Or, use only fonts you already have in the proper sizes.

There are three ways to obtain screen fonts for ImageWriters (many will also work with LaserWriters—a complete discussion appears later in the chapter):

- As a retail product. Thousands of screen fonts are available from dozens of different vendors like as DUBL-CLiCK, T/Maker, and Miles Computing.

- From laser printer or Linotronic service bureaus. Most service bureaus will provide you with screen fonts for use with their printers for no cost or at a very low price (usually no more than the price of the blank disks). Although these are technically screen fonts for high-resolution printers, they will work fine as screen fonts for ImageWriters.

- From user groups and on-line services. Many excellent fonts are available as public domain software or shareware. Boston II and Beverly Hills are two of the most popular.

**Fast, Legible
Draft Printing**

The ImageWriter is capable of printing quite quickly, up to 250 characters per second, in the draft mode. Unfortunately, if you just select the draft mode in the Print dialog of your word processor, you're likely to end up with something that looks like Figure 7–2. Note the unpredictable spacing.

```
The ImageWriter is  capable of  printing quite
fast, up to 250 characters   per   second, in
the draft mode.  Unfortunately,  if you just
try printing    in  the   draft mode, you're
likely to end up     with something that looks
like   this.
```

**Figure 7–2
Badly Spaced
Draft Printing**

There are a couple of things you can do to insure better-quality draft printing. The first is to change your entire document to the Monaco font, 9-point size. This is because Monaco is the high-speed draft font built into ImageWriters.

Just before you print a draft, select all the text and change it to Monaco 9. Also, make sure your text is left justified, not fully justified. You'll get better word spacing if you don't print fully justified text. If you justify your text ragged right, and change the text font to Monaco 9, your draft printouts should look like Figure 7–3.

```
The ImageWriter is capable of printing quite
fast, up to 250 characters per second, in
the draft mode. If the text is Monaco 9, and
not fully justified, you'll get much better
results. The ImageWriter is capable of
printing quite fast, up to 250 characters
per second, in the draft mode. If the text
is Monaco 9, and not fully justified, you'll
get much better results.
```

**Figure 7–3
ImageWriter Draft
Printing with
Optimized
Spacing**

To insure that your draft prints at the highest speed possible, you must press the button on the ImageWriter marked "Print Quality" to select "Draft"; in addition, you must select "Draft" on your screen, in the Print dialog box. This will speed up printing of draft quality documents. As far as I can tell, the "Print Quality" button doesn't have any impact on documents printed at settings

other than Draft—printing documents using the "Faster" or "Best" setting in the Print dialog box seems to ignore the Print Quality button setting on your printer. Nobody I've asked knows why.

What about Ribbons?

ImageWriter ribbons can be replaced with NEC 8023, C.Itoh 8510, or DEC LA50 ribbons. These should be available at any good office or computer supply store. They may be considerably less expensive than Apple-branded ribbons.

If you use your ImageWriter enough, a re-inker may be a good investment for you. A re-inker is an electro-mechanical device that uses a small motor to run the entire ribbon over a felt-covered inkwell. The one I use came from Computer Friends, a company that carries re-inkers for many types of ribbons, including color. They average about $60.

I've had good success with re-inked ribbons, and I think they produce a superior image—blacker blacks and less splatter—once they get worked in. I rotate four ribbons, re-inking them when they begin to print lightly and storing them in a sealed plastic bag until they're used.

Another way to extend the life of a ribbon is to open the case of a used ribbon carefully and spray the ribbon with WD-40 spray lubricant. Reassemble the case and let the ribbon dry for a while before you use it. This can often coax a few more days of life out of an almost-dead ribbon.

Whichever method you choose, don't let your ribbons get old and frayed. Throw your ribbons away at the first sign of tearing or shredding. A frayed ribbon can damage your print head by clogging it with microscopic pieces of ribbon.

Color ribbons are available for all ImageWriters. They have four colors, and can be used with many programs to create low-resolution (but still attractive) color output. Look in the application's manual to find out if the program supports color output on the ImageWriter. If there's no information in the manual, call the manufacturer and ask.

Three
Answers to
the Envelope
Question

Envelopes are always a hassle on the ImageWriter. If you want to print a return address, it takes an interminable amount of adjusting to get one right. Sometimes the envelopes jam. And occasionally, no matter what you do, they smear.

If you haven't already done so, adjust the paper thickness lever to 3 or 4. The paper thickness lever is located in different places on various models. If you're not sure where yours is, refer to the manual. Also, be sure to adjust it back to single thickness when you're done printing envelopes.

This helps clear up jamming and smearing problems. Here are three ways to minimize the pain of envelope printing:

- Use window envelopes. Then, you can just type the name and address in the proper place on the letter or form, and you're in business. Window envelopes imprinted with your logo or return address aren't expensive, and this solution means never dealing with envelopes through the ImageWriter again.

- Get pin-feed envelopes. These are envelopes attached with a temporary glue to pin-feed paper. Believe it or not, you can get pin-feed envelopes at any good office supply store. They're especially convenient if you need to address a bunch of envelopes at a time.

- Get an ImageWriter LQ. It's a bit expensive, but if you're wasting time switching paper and hand-feeding envelopes, it may be just what you're looking for. I had one in my office for about 6 months and it worked well. If you get the optional envelope bin, which I recommend strongly, the ImageWriter LQ driver allows you to select it when you choose Print in your application. The LQ can also handle two bins of letter-head plus a bin of envelopes. You select the bin when you print. It's an elegant solution to multiple paper handling. It also prints documents beautifully (as long as you have the screen font three times the size used in the document installed).

ImageWriter
Warnings

Large Black Areas If you plan to print documents with large areas that print black or a dark gray or pattern, be careful not to overheat your print head. There's no real way to tell until it's too late. You'll know it's too late if you smell a strange burning odor coming from your printer. If you can smell something, stop the print job immediately. You're probably very close to damaging your print head, or have already damaged it.

The solution is to print only one page at a time and wait a few minutes between pages to let your printer's head cool off. Replacing a burnt-out print head can be expensive. It's avoidable. Just give your printer a rest after printing pages with lots of dark areas.

Gummy Labels If you use any kind of sticky label in your ImageWriter, beware: you should never roll the page backward while labels are loaded in your printer. In other words, when you use the knob to move the paper through the printer, don't ever move it backward when you have labels loaded. If you do so, labels may become jammed between the platen and the print head, which can result in an expensive trip to the dealer.

Laser Printers and Tips for Using Them

Laser printers are a different breed of printer. They work using a principle similar to your office copier—using electrostatic charges, toner, and lasers to create crystal clear images on the page.

LaserWriters
and Other
PostScript
Printers

The Apple LaserWriter and LaserWriter Plus (both discontinued), the LaserWriter IINT, and the more powerful LaserWriter IINTX (as well as the Linotronic Laser ImageSetters, discussed later in the chapter) create pages using PostScript, a page description language created by Adobe.

In a nutshell, the LaserWriter and Laser Prep files in your System folder convert the image created by your application (Word, MacDraw, Full Impact, or any other application) into PostScript code, which is sent to the printer. A few applications—most notably PageMaker, which uses its own Aldus Prep file instead of Laser Prep—create their own PostScript, bypassing the Apple printer drivers.

Because PostScript is a very accurate page description language, you can create and preview complex images on the screen and then print a page that is, with few exceptions, the same as what you see on the screen. (This capability is known as WYSIWYG, or "What You See Is What You Get.") The resolution will be the highest the printer allows, because PostScript is what's called a device-independent page-description language. That means Post-Script files will automatically print at the highest resolution the printer allows. PostScript is what makes alphanumeric characters print so nicely on a laser printer or high-resolution image-setter like the Linotronic.

Laser Printer Fonts Fonts designed for use with PostScript printers consist of two parts: the screen font, which you install with the Font/DA Mover (or a utility such as Suitcase II or MasterJuggler), and the printer (or downloadable) font, which you place in your System Folder.

The printer font is downloaded (that is, loaded into the printer's memory) automatically when you use the corresponding screen font. You don't have to do anything more than have the proper screen and printer fonts to make this happen.

To make things even more confusing, some fonts are built into your laser printer. When you're using one of these fonts, you need only have the screen font installed to produce high-resolution printouts; no separate printer font is required.

Fonts that are built into most laser printers include:

- Times
- Helvetica
- Courier
- Symbol

In addition to the plain style, bold, italic, and bold-italic styles are included with all of these except Symbol.

Also built into the LaserWriter Plus, the LaserWriter IINT and NTX, and many third-party PostScript and PostScript-compatible printers are the following fonts:

- Palatino
- Avant Garde
- Bookman
- Helvetica Narrow
- New Century Schoolbook
- Zapf Chancery
- Zapf Dingbats

In addition to the plain style, bold, italic and bold-italic styles are included with all of these except Zapf Chancery and Zapf Dingbats.

So for any typeface included with your printer, you don't need a printer (downloadable) font if you have the screen font available. As long as you have the proper screen font, the printer will supply the high resolution font from its internal memory.

If you would like to use fonts other than those permanently installed in your printer, you'll have to purchase them from a third-party vendor such as Bitstream or Adobe. (In addition to inventing PostScript, Adobe also sells an extensive line of downloadable fonts.)

You should know which fonts are permanently installed in the printer you plan to use. The manual should list them, or you can find out using LaserStatus (part of the DiskTop package from CE Software). Once you know which fonts are permanently installed in the printer, you need to get the screen fonts for those you want to use. Most printers come with a disk containing a complete set of screen fonts that match the built-in fonts. (See the section earlier in this chapter for where to get screen fonts.)

Remember this: If it's not built into your printer, and you don't have the downloadable font in your System Folder, don't use it. It will look lousy.

Many good PostScript and PostScript-compatible printers are made by third-party manufacturers like QMS and Jasmine. (PostScript-compatible printers use a PostScript work-alike, not true Adobe PostScript.) I've found Jasmine's DirectPrint PostScript-compatible printer an excellent performer as well as a terrific value at about $3500. It performs about as well or better than the top-of-the-line Apple LaserWriter IINTX, at about half the price.

One final basic tip: If your laser printer seems stalled out and/or your Mac has frozen, restart both of them. This happens

occasionally when you send a page that's too complicated for the printer to understand. First restart the Mac, then restart the printer by turning it off, waiting a few seconds, then turning it back on. (Remember, restarting clears your RAM, so you can start out fresh.) Now that both machines have been restarted, try again. If the page still refuses to print, try using a different Mac and laser printer, preferably ones with more memory (both Mac and printer) than the ones you first tried it on.

About Non-PostScript Laser Printers

There are some laser printers that don't use PostScript. The Apple LaserWriter IISC and the GCC Personal Laser Printer are the most popular. Instead of PostScript, they use QuickDraw, the descriptive language built into every Macintosh (it's in the ROM). Though they're significantly less expensive than their PostScript counterparts, they also have some drawbacks.

First, the selection of fonts for these types of laser printers is not as large as it is for PostScript.

Second, they may have problems printing large or extremely complex documents. Unlike PostScript printers, which process your file at the printer, a QuickDraw printer uses your Mac to do the processing, then sends the processed information to the printer. Because your Mac is doing more work, QuickDraw printers may require more than 1Mb of RAM to print certain documents.

Third, some applications (FreeHand, Illustrator '88) are almost useless without PostScript. This is becoming less of a problem as non-PostScript laser printers become more popular, but it is something to check into before you buy. If you plan to purchase a QuickDraw (that is, non-PostScript) printer, you should first test it extensively with the applications you use most frequently.

Finally, QuickDraw printers don't work as well as a Post-Script printer for proofing before output on a Linotronic. That's because the Linotronic is also a PostScript device, so the page it prints will be an exact match of the page you printed on a Post-Script printer, except that the Linotronic will print it at the highest resolution it can. All spacing will be exactly the same, whether you use a PostScript laser printer or a Linotronic. The only difference is that the laser printer output will be at 300 dpi, and the Linotronic will be 1,270 or 2,540 dpi, depending upon which model you use.

A non-PostScript laser printer will serve you well if you use it for correspondence, graphics created with compatible programs (such as Canvas 2.0 or SuperPaint 2.0), and reports. If you plan to do serious page-layout work, if you want to use powerful drawing programs like FreeHand and Illustrator '88, and especially if you plan to use a Linotronic for camera-ready output, you'll want a laser printer with PostScript.

Getting Rid of the Startup Page

Most laser printers spit out an annoying startup page (sometimes called the test page) when you turn them on. There are two ways to prevent it:

- Use Widgets. It comes with DiskTop, from CE Software (see the previous chapter). It has a menu item for turning the startup page on or off.
- Pull the paper tray out a little bit before turning your laser printer on. Don't push it back in until your laser printer is warmed up, usually one or two minutes. This fools the printer into thinking it's already printed the startup page.

Blacker Blacks and Less Toner Flaking

If you want your laser printed pages to be even better looking, go to an artist's supply store and buy a can of spray fixative. It's a protective coating for artwork, primarily used by artists. It also happens to be wonderful when used on laser-printed output.

Krylon is the brand I use. It comes in matte and crystal clear finishes; I prefer matte, which doesn't create as shiny a finish, but you should try them both. When your page comes out of the laser printer, give it a misting with this stuff. Black areas will get blacker and the page will stand up better to handling because the fixative binds the toner to the page. It's also helpful if you use laser-printer output as camera-ready art for printing. Spray fixative on anything you're going to have reproduced, even if it's being copied on the office copier. The blacker blacks and lack of toner flaking will make the results more aesthetically pleasing. For the same reason, it's especially important to use fixative on anything you're taking to the printer to have professionally printed. You'll be surprised at how much better pages look after fixative is applied.

One word of warning: Don't use too much or you'll end up with a runny mess. A light mist is all that's needed.

The Question of Paper

For everyday use, the cheapest photocopier paper you can get is fine. There's even a school of thought that says it's better than more expensive paper because there is less powder between the sheets (to keep them from sticking together).

For better-quality output, especially for documents that will be printed or photocopied, I find Hammermill Laser Plus to be as good as any paper. You'll find it at any good office *supply store* or paper distributor; look in your local Yellow Pages. At about 2.5¢ a sheet, it's somewhat more expensive than cheap photocopier paper, which can usually be found for less than 1¢ a sheet. Laser Plus has a finer finish, is a little sturdier and seems to take the toner better than cheap photocopier paper.

Whenever I prepare final, camera-ready documents on a laser printer for reproduction or printing, I use CG Graphic Arts LASEREDGE paper. It's even more expensive than Hammermill Laser Plus(between 7¢ and 12¢ a sheet), but it's whiter, and the dots appear crisper. LASEREDGE papers are treated with a special chemical coating that insures that 100 percent of the toner is applied to the surface of the paper and none is absorbed. Most other papers absorb at least a part of the toner into the sheet. This is why LASEREDGE paper is the best paper I know for final camera-ready work.

With all of these papers, a misting with a spray fixative will improve the appearance and durability of your page. It may not be necessary if you use LASEREDGE papers. If you're unsure, print two copies of the same page, and mist only one with fixative. Now examine them both closely, preferably with a magnifying glass. Choose the one which has the most perfectly formed characters and/or the richest black tones.

Tips on Envelope Printing

Envelope printing on a laser printer can be tricky. You need to feed envelopes into the manual feed slot very carefully, at just the right time, or they'll jam.

Here's how to print a perfect envelope every time:

Make sure the address will print where you want it to. You do this by following steps 1-3, then Printing using Automatic rather than Manual feed. This will print a mock up of your envelope on whatever paper is loaded in your laser printer.

1. Use Page Setup to select the Landscape mode.
2. Select Print from your application.
3. Select Automatic Feed from the Print dialog box. This will print a mock-up of your envelope on whatever paper is loaded in your laser printer. Make sure the placement of all elements is correct.
4. Now, repeat steps 1 and 2. Then select Manual Feed from the Print dialog box.
5. (Now for the tricky part.) Run quickly to the laser printer and place the envelope in the feed tray. Put a bit of gentle pressure on the back (trailing) edge of the envelope (Figure 7–4).

If you have any of the LaserWriter IIs, envelopes shouldn't be as much of a problem. They have better manual paper-handling capabilities than the LaserWriter and LaserWriter Plus.

Another problem you may have with printing addresses on envelopes is getting them to print in just the right spot. The trial-and-error method in step 1 above is a pain. One sure way is to get a copy of the shareware DA Kiwi Envelopes (Figure 7–5). Kiwi Envelopes automatically prints the address and return address
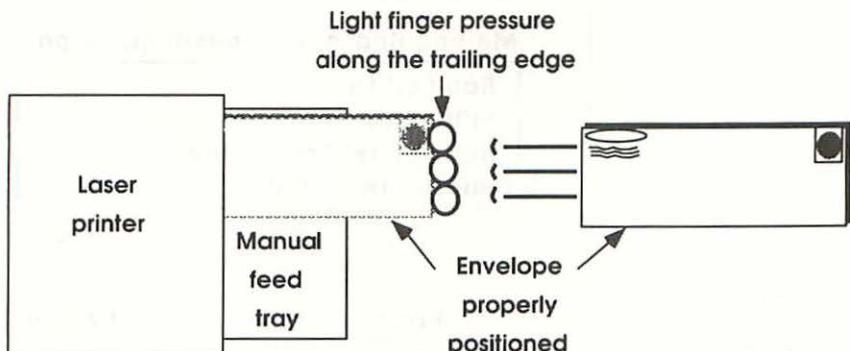
Figure 7–4
Envelope Printing
on the LaserWriter
and LaserWriter
Plus

in the proper places on the envelope no matter what printer you use, even an ImageWriter I or II.

With Kiwi Envelopes, you simply type or paste the address and/or return address into the proper window, select the envelope size you are using, then click the Print button and feed an envelope to your printer (use the trailing edge trick above if you're using a LaserWriter or LaserWriter Plus).

Kiwi Envelopes automatically pastes whatever is on the Clipboard into the mailing address field. If you copy the mailing address you need from a letter or database before invoking Kiwi Envelopes, it will appear automatically on your envelope.

The return address field comes up blank. This is good for preprinted envelopes. You also have the option of typing in a return address or even pasting in a picture.

If you can't get it elsewhere, you can send $8.00 to Kiwi Software for the latest version. I've pasted their address into the Return Address field of Figure 7–5.
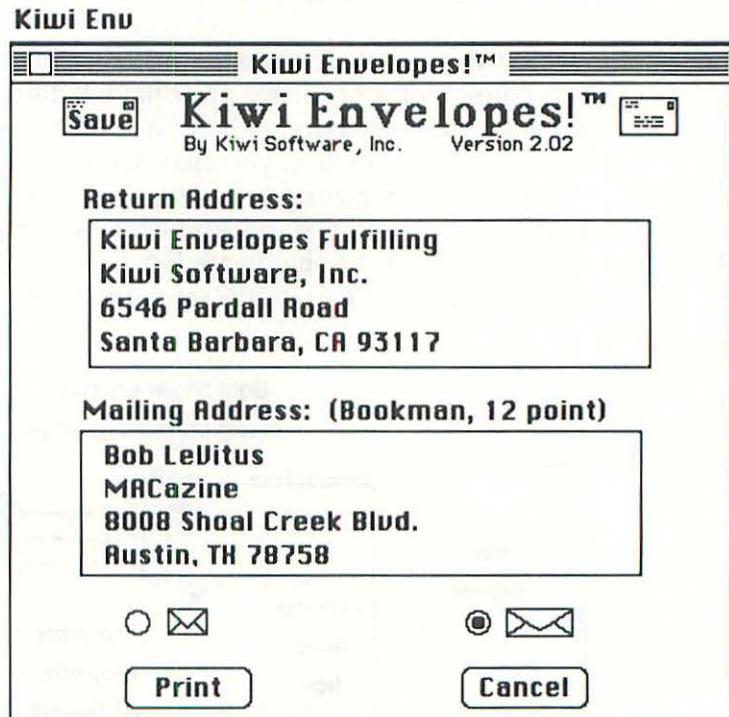
Kiwi Env

Figure 7–5
Kiwi Envelopes
Makes Printing an
Envelope Easy on
Any Printer

Magic Laser
Printer
Scaling
Percentages

If you're printing a bit-mapped graphic (that is, one created with MacPaint, FullPaint, or most programs with "Paint" in their names) reduce it by one of these percentages before printing it on a laser printer: 96, 72, 48, or 24 percent.

Here's why those percentages are so important:

Your Mac screen displays 72 dots per inch. MacPaint images are stored at 72 dpi. In order for dots not to be squashed (that is, distorted and showing a lot of "jaggies") when being converted from 72 dpi to 300 dpi, you need to scale them by the appropriate percentage.

If you don't reduce the paint image, your laser printer must print 4.166 dots (at 300 dpi) to represent each dot on the screen (72 dpi):

```
300 ÷ 72 = 4.166
```

Because the printer can't print fractions of a dot, paint images that aren't reduced by one of the magic scaling percentages may show more jagged edges than those that are. In fact, jaggedness in printouts of non-reduced images will be greater than what you see on the screen.

If you *do* reduce the paint image to 96 percent of its original size, your laser printer can print exactly 4 dots (at 300 dpi) to represent each dot on the screen (72 dpi):

```
300 * .96 = 288
288 ÷ 72 = 4.000
```

Because there are no longer any fractions of a dot, paint images will print with less jaggedness.

There is an automatic way to reduce images by the largest magic percentage, 96 percent: select "Precision Bitmap Alignment" from the Page Setup dialog before you print. This reduces your entire page to 96 percent of its original size.

If that's undesirable, as it may be if your final output must exactly match the dimensions you used to create it, most page-layout software allows you to scale only the bit-mapped graphics. PageMaker even does it for you if you scale an image while holding down the Command key, as long as you've selected the

proper printer in the Chooser. The Clipper (discussed in Chapter 6) will allow you to scale bit-mapped images for use in programs that don't support scaling.

Some image distortion will occur at reductions greater than 96 percent. That's because the density of the dots increases as you reduce the graphic more. At 24 percent, many bit-mapped graphics, particularly those with large patterned or black areas, will squash down into unattractive blobs. Still, at percentages other than the magic ones, the distortion will almost always be worse.

Toner Cartridges

There is a great deal of controversy over whether it is safe to use recharged toner cartridges. Most printer manufacturers don't recommend it. That's to be expected; they make lots of money selling you new toner cartridges!

A new toner cartridge costs around $100. A recharge from a reputable supplier is about half of that. My experience is that you can usually recharge a cartridge at least two or three times before discarding it.

There are a number of recharging companies, many of whom advertise in the major Mac magazines. If you're not interested in having your cartridges recharged, there are also places that will pay about $10.00 for used ones. These companies also advertise in the Mac magazines.

I've had good luck with LaserCharge here in Austin, Texas. Their address and phone number appear in the "Recommendations" section at the end of the chapter.

If you want to have your laser cartridges recharged, be sure to ask the following questions:

- Do they drill a hole in your cartridge?
  If the answer is yes, find another recharging company. The better ones completely disassemble your cartridge, clean it, replace worn components, and fill it with toner.
- Do they "pool" their cartridges?
  In other words: Do you get back the same cartridge you sent in, or do they send a recharged cartridge out of inventory? You don't want to use a company that

pools cartridges. You could send in a cartridge that's never been recharged, and get back one that's been recharged 7 or 8 times. Definitely not what you want.

I couldn't swear to it, but the recharged cartridges seem to print blacker blacks than a new cartridge. According to the rechargers, that's because the toner they use for refilling is more active (that is, the particles have a stronger charge) than the toner used in new cartridges. This makes sense.

Another thing I've noticed is that recharged cartridges seem to last longer, perhaps 10–20 percent longer than new ones. Again, the rechargers claim this is because they use more toner when they refill a cartridge than it came with originally.

I've never had a problem with any of the cartridges I've had recharged. If you ask the questions listed above before letting anyone refill yours, you shouldn't have problems either.

Linotronic: Typesetting Driven by a Mac

The Linotronic Laser ImageSetters are very high resolution output devices capable of printing pages at resolutions as high as 2,540 dpi. Technically, these aren't printers; they're typesetting machines. They are used when the 300-dpi output of a laser printer isn't good enough. The pages in this book, for example, were output on a Linotronic 100 at 1,270 dpi before being sent to the printer for printing and binding. Color separations and high-resolution black-and-white halftones are possible using the 2,540-dpi output of the Linotronic 300. A Linotronic ImageSetter works on a principle similar that used by a laser printer, except that instead of fusing toner to the page, the laser in a Linotronic device is used to print the images to extremely high resolution film. Of course, as in other PostScript printing devices, the image is described in PostScript, but unlike those from other printers, the pages that come out of a Linotronic need to be processed using a procedure similar to developing film from a camera.

Most people don't own a Linotronic. Rather, when they need pages printed on one, they go to a service bureau, where they can have them output for a price per page, usually not more than $10.00, sometimes substantially less.

Tips for Working with Service Bureaus

The results you get from work done by a service bureau can range from breathtaking to hair-raising. There are a few things you can do to insure that your service bureau job runs smoothly:

- Talk to your service bureau before you begin work. Your service bureau representatives can help you and your typesetting job a great deal. Tell them what software and fonts you plan to use, and tell them what type(s) of graphics (Paint, PICT, EPS, TIFF, etc.) are used. They may want you to supply suitcase files containing the fonts you used in your document, or they may want you to supply the System Folder you used to create the document. They may even want you to provide a copy of the program used to create the document.

  In any case, start your jobs right by talking to your service bureau *before* you begin.

- Get and use the right fonts. Most service bureaus will give or sell you the screen versions of their PostScript fonts. Use them. Plain, italic, bold, and bold italic screen fonts are available for most popular PostScript fonts. If your service bureau can't provide them, most are available in the Adobe forum on CompuServe.

- Proof your work on a LaserWriter or other PostScript or PostScript-compatible laser printer. If you proof your work on a dot-matrix or even a non-PostScript laser printer, you may be in for a surprise when you print your document on a Linotronic. Line and character spacing, as well as object placement, may change.

  A PostScript printer will give you a proof that shows you almost exactly what your page will look like when printed on a Linotronic.

  Line weights and gray shading print differently on a laser printer than they do on a Linotronic. For example, the LaserWriter prints gray shades darker than the Linotronic does. So the LaserWriter's 20-percent gray is somewhat darker than the same 20-percent gray output on a Linotronic. Quarter and half-point lines are printed as one point on a LaserWriter; they print accurately on a Linotronic.

- Unless you're very confident in your telecommunication skills, don't try using a modem to send your files when you're on deadline. If sending files to a service bureau via modem is an option you'll find useful, try a dry run when you aren't facing a deadline.

  Call and talk to a service representative before you try your upload. Get instructions, pricing, and delivery information. Then, after uploading your file, follow up on your transmission. Call and make sure the file was received and will be processed and sent to you as agreed.

More Tips from a Service Bureau Owner

M & L Typesetting Services, here in Austin, Texas, was responsible for typesetting *MACazine* on their Linotronic 100 every month. They also typeset this book. I send them PageMaker files (they're generally too big to send over modem—I usually just give them disks); they send back typeset, camera-ready pages. I interviewed the owner, Wayne Matthews, who had these tips:

- Protect your disk. Don't put disks in plastic bags. The static electricity can scramble them. Protect them in some way, and keep the shutter from bending. There's nothing more disappointing than getting to the service bureau and finding that your disk is damaged. A cardboard disk mailer or almost any kind of disk holder will help. If you transport a lot of disks, you should give this subject some thought.

  You might even consider taking two copies of your work, on separate disks. Also, never take your only copy of a disk or document to a service bureau—always have at least one backup copy in another location.

- Bring in a list of fonts used in the document. Quark XPress 2.0 has a command that displays a list of all the fonts used in a document. If you use PageMaker or other page-layout software, however, no such list is available through the software, and a list of the fonts you used will help your service bureau print your pages better.

- If you haven't bought a page layout program yet, we prefer to work in PageMaker. Quark XPress has presented problems for us in the past, with pages printing slowly or not at all. Version 2.0 is better, but we've found Aldus' technical support for PageMaker to be vastly superior, especially for the Linotronic operator. They almost always have an answer when we have a question on using PageMaker with our Linotronic.

- Don't make your pages too complex. There is a breaking point for the Linotronic. Pages with complex PostScript, TIFF, or bit-mapped graphics—or, God forbid, a combination of these—may cause the Linotronic to run out of memory. A single page with six or eight complex charts plus text in a couple of fonts may refuse to print.

  Some examples of complex graphics are large bit-mapped graphics, large TIFF files containing gray-scale information, and encapsulated PostScript files with large numbers of objects or sophisticated PostScript special effects, such as rotated text, text along a path, and graduated fills.

  If you can, avoid having more than one complex graphic on any page.

- Don't use fonts with city names, such as New York or Monaco. Almost none of the fonts called by city names are laser fonts. If you aren't familiar with PostScript fonts, talk to your Linotronic operator about it. You need to use the Adobe Screen Fonts. We'll be glad to copy them onto a disk for you when you come in. Your service bureau should too.

Recommendations

A wide variety of printers are available. The products I recommend are listed below.

Printers

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
408–996–1010
ImageWriter II (dot matrix): Approximately $600
ImageWriter LQ (dot matrix): Approximately $1,400
LaserWriter IISC (QuickDraw): Approximately $2,800
LaserWriter IINT (PostScript): Approximately $5,000
LaserWriter IINTX (PostScript): Approximately $7,000

Apple's printers are excellent performers, but may be significantly more expensive than other brands. The advantage of Apple's dot matrix printers (ImageWriter II, LQ) is that they're designed to work with your Mac right out of the box. Other brands of dot matrix printers may not be as compatible (that is, they may require some tinkering with dip switches or special printer drivers to work properly). For that reason, I recommend Apple products if you're considering a dot matrix printer.

That's not the case for laser printers, particularly PostScript models. Most other PostScript and PostScript-compatible printers, such as those offered by QMS and Jasmine, are just about as easy to configure as the Apple products, and cost significantly less.

There is one significant advantage to buying a laser printer from Apple—your printer can be upgraded to a more powerful model at a later date. For example, if you purchase an Apple LaserWriter IISC, a non-PostScript printer, you can later upgrade it to a PostScript IINT (about $2,700) or NTX (about $4,700) by having your Apple dealer install the appropriate upgrade. No other manufacturer presently offers this kind of upgrade capability.

Jasmine Technologies, Inc.
1740 Army Street
San Francisco, CA 94124
800–347–3228
415–282–1111
DirectPrint (PostScript compatible): Approximately $3,500

This PostScript-compatible printer offers performance similar to the Apple LaserWriter IINTX, at about half the price. The only drawback is that Adobe-brand downloadable fonts don't work with PostScript-compatible printers at this time; they work only with genuine PostScript. This should only be a problem if you've already got a large investment in Adobe downloadable fonts. And even if you do, you could probably replace them with fonts from another vendor with the money you'll save buying this printer.

All things considered, this is one heck of a printer, at an incredible price.

Jasmine products are not available through dealers; they may only be ordered direct.

QMS
P.O. Box 81250
Mobile, AL 36689
205–633–4300
Laser Connection
P.O. Box 850296
Mobile, AL 36685
205–633–7223

Two divisions of the same company; both manufacture a wide variety of PostScript and non-PostScript laser printers.

GCC Technologies
580 Winter Street
Waltham, MA 02154
617–890–0880
Personal LaserPrinter (QuickDraw): Approximately $2,000
Business LaserPrinter (PostScript): Approximately $4,000

Linotype Company, Inc.
425 Oser Avenue
Hauppauge, NY 11788
516–434–2016

Linotronic Laser ImageSetters are available starting at about $30,000.

Fonts

DUBL–CLiCK Software, Inc.
9316 Deering Avenue
Chatsworth, CA 91311
818–349–2758
Approximately $ 80 per package

DUBL–CLiCK offers font packages for ImageWriters and laser printers.

T/Maker
1390 Villa Street
Mountain View, CA 94041
415–962–0195
ImageWriter Fonts: Approximately $50
Laser fonts: Approximately $80

T/Maker offers numerous font packages for ImageWriters and laser printers.

Miles Computing
5115 Douglas Fir Road
Calabassas, CA 91302
818–340–6300
Approximately $50

Miles Computing offers only ImageWriter fonts.

Boston II and Beverly Hills ImageWriter Fonts
Shareware

Available from user groups or on-line services.

Bitstream
Athenæum House
215 First Street
Cambridge, MA 01242
800–522–3668
617–497–6222
Approximately $150 per set

Bitstream offers a wide variety of fonts for ImageWriters and laser printers.

Adobe Systems, Inc.
P.O. Box 7900
Mountain View, CA 94039
800–344–8335
415–961–4400
Approximately $95–$370

Adobe offers one of the widest selections of PostScript fonts, which is not surprising, since they invented PostScript.

Paper   **Hammermill Paper Co.**
East Lake Road
Erie, PA 16533
800–242–2148

Hammermill paper is not available direct from Hammermill; it can be obtained through paper distributors and some office supply stores. Check your local Yellow Pages.

CG Graphic Arts Supply, Inc.
481 Washington Street
New York, NY 10013
800–342–5858
212–925–5332
LASEREDGE paper: Approximately $18–$30 per 250 sheets

Sampler with 15 sheets of 5 papers plus 8 sheets clear and tinted transparencies: Approximately $20.

Miscellaneous **Computer Friends**
14250 N.W. Science Park Drive
Portland, OR 97229
503–626–2291
Ribbon re-inkers starting at approximately $40

DiskTop (includes Widgets and LaserStatus)
CE Software
P.O. Box 65580
West Des Moines, IA 50265
515–224–1995
Approximately $50
512Ke, Plus, SE, II, IIx, SE/30

Kiwi Envelopes
Kiwi Envelope Fulfilling
Kiwi Software, Inc.
6546 Pardall Road
Santa Barbara, CA 93117
805–685–4031
Approximately $8

Kiwi Envelopes is shareware, and it should also be available from on-line services and user groups.

LaserCharge
12115 Roxie Drive
Austin, TX 78729
800–223–8134
512–335–8191
Approximately $50 depending on cartridge type

LaserCharge will give you instructions for sending your cartridge to the main office in Austin, or they will provide the name of a local approved LaserCharge dealer—call for details.

Summary

Probably the best advice I can give you is to allow more time for printing than you think you'll need. You'll almost always find something you want to change in your first printout. Don't cross your fingers as you hit the "OK" button at 9:59 to print the reports for that ten o'clock meeting. Allow extra time to scrutinize your print job.

Another thing: you don't have to buy an Apple laser printer. QMS makes excellent PostScript laser printers, as do several other vendors. You may save hundreds or even thousands of dollars buying a third-party PostScript printer.

Finally, when you need professional-looking results, try using a Linotronic service bureau. You'll be surprised how little effort it takes to create beautiful, typeset pages on your Mac. This book, for example, was typeset using PageMaker 3.01, a Jasmine DirectPrint (for proofing), and a Linotronic 100 (for final camera-ready output).

8

Telecommunication

Using a modem to connect with the world.

I think my modem is the one peripheral I'd have the hardest time doing without. I could probably exist without my hard disk or my large screen monitor. But take away my modem and you've cut me off from the rest of the world.

I use my modem a dozen times a day. As the editor-in-chief of MACazine, I needed timely feedback on Macintosh hardware and software. My modem made it possible for me to collect it without leaving my desk.

I talk to friends I've made and check my electronic mail on CompuServe, GEnie, and MacNet every day. I post questions asking how people like products they've purchased. I look for messages about bugs

and problems. If a product shipped yesterday, tomorrow I'll be reading users' experiences with it on CompuServe.

A modem is more than just information about the Mac. It is a magic carpet; it can take you anywhere. Not only can you communicate with hundreds of thousands of computer users, with a modem you can even investigate or order goods and services without leaving your keyboard.

Here are just a few of the things you can do with a modem:

- *Transfer text or files between Macintoshes in different locations*
- *Chat with other computer users in real time*
- *Send messages asking for help with your hardware or software*
- *Read messages about hardware or software that interests you*
- *Send electronic mail faster and cheaper than by Federal Express*
- *Download thousands of public domain and shareware programs, DAs, and fonts*
- *Order merchandise*
- *Buy stocks and securities, or check their prices*
- *Reserve airline tickets*

A modem opens up the world to your computer. This chapter will help you select hardware and software for connecting your Mac to the world as well as give you an idea of what to do once you're hooked up.

Selecting a Modem

A *modem* (MOdulate/DEModulate) is a device that allows your computer to communicate with computers of almost any type, via telephone lines. Unlike modems for the PC and other computers, the vast majority of Mac modems are external.

Technically speaking, a modem converts digital information (bits and bytes) from your Mac into analog information (noise) that can be sent over standard phone lines; at the same time, it converts incoming analog information into digital information your Mac can understand.

A modem is a little box that plugs into the printer or modem port on the back of your Mac. It also needs to be connected, using standard modular phone jacks, to a telephone line. Finally, it requires AC power, so it will need to be plugged into a power outlet.

If you expect to use your modem a lot, you should consider having a separate phone line installed for it. That way, you can have uninterrupted service for both voice and data. I use my modem so much I've even had a second line installed in my home for the modem there.

Important note: If you have call-waiting on your phone line, you should contact your phone company and find out if it can be temporarily disabled. Many phone companies allow you to turn call-waiting on or off using the # or * keys on your phone. If you're in the middle of a modem session and call-waiting clicks in, your modem connection will be be broken, wasting time and money.

Modem Terminology

There are a few terms you should understand before you purchase a modem:

Baud Rate Technically, *baud rate* describes the number of discrete signal events per second occurring on a communications channel. Though it is technically incorrect to do so, *baud rate* is often used to refer to bits per second (bps).

Baud rate measures how fast your modem works. Higher rates mean faster sending and receiving, but although doubling the baud rate does improve throughput quite a bit, it doesn't quite double it.

The speed of transmission between any pair of modems cannot be faster than the slower modem of the pair. For example, if you have a 19,200-baud modem and your friend has a 2,400-baud modem, you'll communicate at 2,400 baud. This makes sense: a 2,400 baud modem isn't capable of running at 19,200 baud. If it were, why would anybody buy a more expensive, higher-baud modem?

Baud rate is tricky: slower modems are cheaper, but they cost you more in the long run. This is because you pay for both telephone time and most telecommunication services by the minute. Although some services charge more for faster baud connections

(though most have now have the same rate for 300, 1,200 and 2,400), the difference in cost is more than offset by the higher throughput a faster modem provides. A slow modem (300 or 1,200 baud) takes longer to send or receive. Also, you pay for phone time. Slower modems will cause you to stay connected longer, increasing your phone bill as well as your on-line charges.

The most common modems run at 1,200 baud and can be found for just over $100. Recently, though, the price of some 2,400-baud modems has dropped to around $200, and I'd guess 2,400-baud modem sales will soon surpass even the popular and less expensive 1,200-baud variety.

Modems that run at 9,600 and 19,200 baud are available but are quite expensive, with prices starting at just over $1,000. If you need to telecommunicate data at very high speeds between two locations, these might be just the thing. But if you're buying a modem to telecommunicate with friends, business associates, on-line services, or bulletin boards, bear in mind that very few services support baud rates above 2,400. Another thing to think about is that there is, at present, no standard for 9,600-baud or higher modems. This means that if you buy a 9,600-baud modem from Company X, and your friend buys a 9,600-baud modem from Company Y, it's possible they won't be able to communicate with each other. (There are standards for 2,400 baud and lower—at these speeds, almost every brand can be used with almost any other.)

Perhaps by the time you read this a high-speed modem standard will have been adopted. Before buying any ultra-high speed equipment (9,600 baud or faster), make sure it will be compatible with any modems you plan to communicate with.

Hayes-compatible Modems *Hayes-compatible modems* are modems that comply with the command set created by modem manufacturer Hayes Microcomputer Products, which has become the *de facto* standard for telecommunication. The Hayes command set is sometimes called the "AT command set" because it uses the prefix AT to get your modem's attention.

In theory, any modem that is 100-percent Hayes-compatible should work properly with any software or other modem. That's because the vast majority of hardware that runs at 2,400 baud or less, as well as every software package I know of, as-

sume Hayes compatibility. Although it is possible to configure a modem that's not 100-percent Hayes-compatible to work with other modems that *are* Hayes-compatible, it's a hassle and not for the faint-of-heart or inexperienced.

If you select a modem other than a Hayes, make sure you can obtain a refund if it doesn't prove to be 100-percent compatible. Many off-brand discount modems are only partially Hayes-compatible, and they may cause you headaches when you try to use them with modems that are completely Hayes-compatible.

File-transfer Protocols   When you shop for telecommunication software, you'll run into terms like *XMODEM, YMODEM, Kermit* (which, by the way, has absolutely nothing to do with frogs), and *MacBinary*. These are protocols that allow your Mac to send data back and forth to other computers; these protocols also automatically check for errors and correct them if possible.

Most programs support all four protocols mentioned above, and some may support others.

XMODEM is by far the most common protocol. It can be used by any two computers, no matter what the brands, as long as both are equipped with software that supports XMODEM.

MacBinary is a standard used to transfer Macintosh documents and applications over phone lines. It ensures that all the information necessary to reproduce the file, with all of its Macintosh attributes, comes through at the receiving end.

All of the software discussed in this chapter supports XMODEM and MacBinary transfer, which is probably all you need. If you know you'll be communicating with a specific computer, find out what file-transfer protocols that computer's software supports, and select a program for your Mac that also supports it. For example, many academic institutions have mainframes that use the Kermit protocol.

Shopping
For a
Modem

When you shop for a modem, get the fastest (in terms of baud rate) Hayes-compatible modem you can afford.

There are dozens of modem brands available. I've had good experiences with Hayes and US Robotics, both of which are widely available. Whichever brand you select, make sure you can obtain a refund if it proves not to work properly with the software and

on-line services you choose. If you can't get the modem to function after reading the manual, give the manufacturer a call for technical support.

Telecommunication Software

Telecommunication software tells your modem what to do. It runs the gamut from simple and inexpensive programs, such as Mock-Terminal, to extremely sophisticated and powerful packages, such as MicroPhone II or Red Ryder. Even the most basic software allows you to send one application or document at a time or to converse with a person at a remote computer by typing messages (they appear on-screen). More sophisticated software will allow you to perform many of your telecommunication chores without intervention.

Most commercial telecommunication applications include features that allow you to automate most of your telecommunication chores: logging on, typing in your account number and password, and downloading your electronic mail.

If you have enough RAM for it (that is, more than 1Mb), many programs support MultiFinder fully and run "in the background." This means you can use your computer for something else, such as word processing, spreadsheet manipulation, or database functions, even when a telecommunication session is in progress. You may notice a slight slowing of all tasks when a telecommunication session is running in the background, but the slow-down is usually quite tolerable (10–20-percent decrease in performance) on a Plus or SE and hardly noticeable on a Mac II, IIx, IIcx, or SE/30.

MicroPhone II (Software Ventures), Red Ryder (FreeSoft), and Smartcom II (Hayes) are the three leading telecommunication software packages for the Mac. MockTerminal, part of CE Software's MockPackage Plus Utilities, isn't nearly as powerful, but it has a significant advantage—it's a DA, so you can use it without leaving your application, even if you only have 1Mb of RAM. If you don't have the RAM to run MultiFinder, you might find MockTerminal useful.

Now I'll briefly describe the strengths and weaknesses of these packages.

MicroPhone II   MicroPhone II is probably the most powerful of the currently available telecommunication programs. It is the most expensive as well.

MicroPhone's biggest strength is its flexibility. It's probably the easiest program to use to create scripts or automate repetitive tasks. Figure 8–1 shows the interface of MicroPhone's script editor. In the illustration, I'm working on a script to log on to CompuServe.

Scripts can also be created using the "Watch Me" feature. Just select Watch Me from the Scripts menu, then perform the sequence of actions you want to have recorded as a script. When you're done, select End Watch Me from the Script menu. If you want to modify or change anything about the script you've recorded, select Modify Script from the Script menu and change whatever you like using MicroPhone's script editor.

After that, you'll have a macro that can be played back with a single keystroke. If it sounds suspiciously like QuicKeys or MacroMaker, that's because it is. Most telecommunication programs have a built in macro-like ability.

Other useful and possibly invaluable features (depending on your needs) include support for non-standard modems (those that are not 100-percent Hayes-compatible) and terminal emulation (VT-102 and TTY, which allows your Mac to function as a dumb terminal when connected to a larger computer via modem). The well-written, easy-to-follow documentation is another of MicroPhone II's strengths.
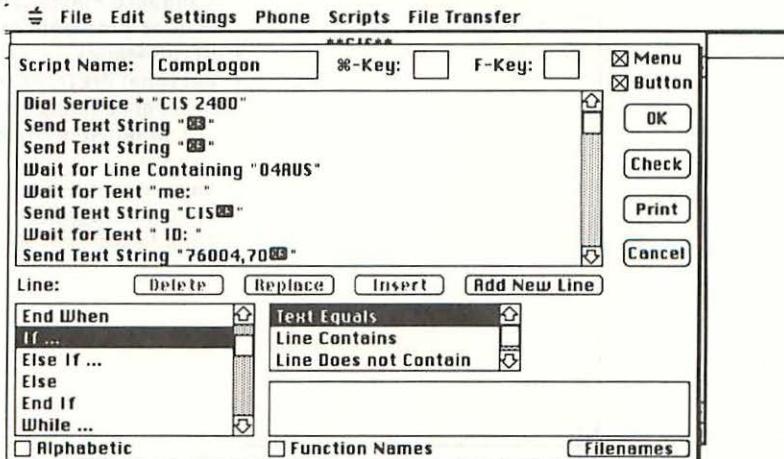
Figure 8–1
MicroPhone II's
Script Editor

Red Ryder

Red Ryder is one of the oldest programs available for the Mac. It's also the least expensive telecommunication program, priced very reasonably. Programmer Scott Watson considers this program his first-born child. It has undergone almost continual upgrades, including a total rewrite in a more powerful programming language, which resulted in the powerful new version 10.

Red Ryder Version 10 is a world-class program. Scripting is as powerful, or perhaps even more powerful, than that offered by MicroPhone. Unfortunately, Red Ryder currently doesn't have its own script editor; you edit your scripts using any text editor or word processor capable of saving an ASCII text file. Of course, because I've complained to Watson about this awkwardness, I expect to see an excellent script editor in an upcoming release. By the time you read this, it's entirely possible Red Ryder will already have it.

Watson says Red Ryder will never be finished. As he has released something like 20 versions over the past 4 years, I suspect he means it. He listens to his users, and new versions are likely to incorporate features suggested by owners of the program. Not only that, if you call for technical support, there's a
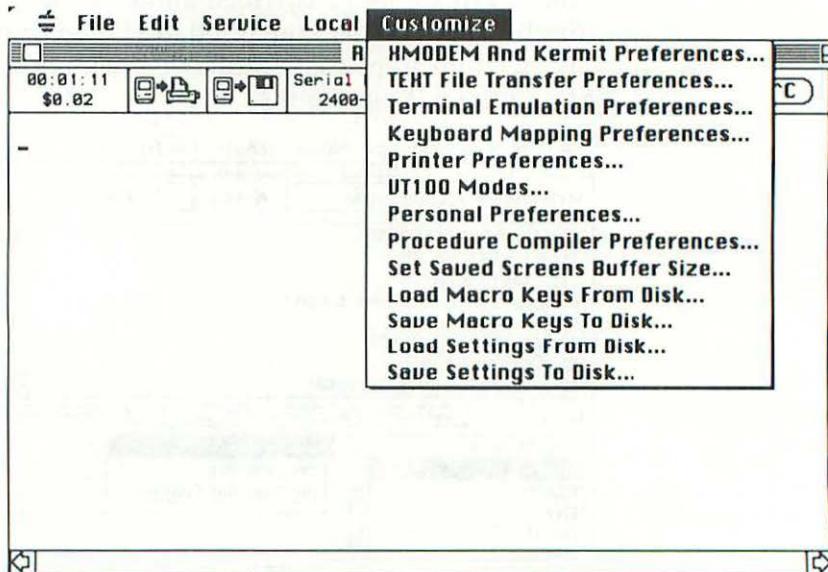
Figure 8-2
Red Ryder's
Interface Isn't
as Slick as
MicroPhone II's

File Edit Service Local Customize

HMODEM And Kermit Preferences

Timeout after [5] seconds   ☐ Special Kermit ^Q handshake

☒ Use and recognize CRC error checking

☒ Use and recognize MacBinary format for non-TEXT files

☐ Send TEXT files using MacBinary format

Received non-MacBinary format TEXT file creator: [MACA]

☐ Strip linefeeds from received non-MacBinary format TEXT files

☐ Auto-receive using volume/path:

** Same Volume/Folder As Red Ryder **

☐ Before sending, instruct remote Red Ryder to auto-receive

☒ Enable CompuServe 'B' Protocol (download only)

☐ SUPERCHARGED HMODEM™ receive (does not correct errors)

☐ Use and recognize 1K blocks   [OK]   [Cancel]

Figure 8–3
One of Red
Ryder's Unwieldy
Dialog Boxes

good chance Scott will take the call. You can also get technical support on-line; Watson has a special section set aside on GEnie, one of the biggest on-line services. (There's more about GEnie later in this chapter.)

Other features include a full range of terminal emulation settings, support for almost any file-transfer protocol you're likely to need, and a built-in phone book.

On the down side, the documentation is occasionally unclear or confusing. In addition, the user interface is ugly and somewhat confusing at times. In Figure 8–2 you can see that many of Red Ryder's preferences are accessed from the Customize menu. Most of these choices bring up large, ugly dialog boxes with a plethora of choices, as shown in Figure 8–3.

Red Ryder has a "Watch Me" function that is similar to that found in MicroPhone II, but because Red Ryder doesn't have its own script editor, it's harder to debug a script or write one from scratch.

Smartcom II

Smartcom II is the software product of Hayes Microcomputer, the same folks who make Hayes modems and who invented the now-famous Hayes command set. Smartcom II is the easiest to learn and use of the three programs discussed here.

Smartcom II has a simple icon-driven interface, and is extremely popular among those who want a fairly powerful telecommunication program that's easy to learn as well as easy to use. It is the only telecommunication package with on-line help, as shown in Figure 8–4. The help is excellent. If you like the convenience of having on-line help available, you should definitely consider Smartcom II.

Smartcom II is priced between Red Ryder and MicroPhone II. Though its scripting capabilities are not as powerful as those of either MicroPhone II or Red Ryder, its ease of use and learning make it an excellent choice for your first telecommunication software package.
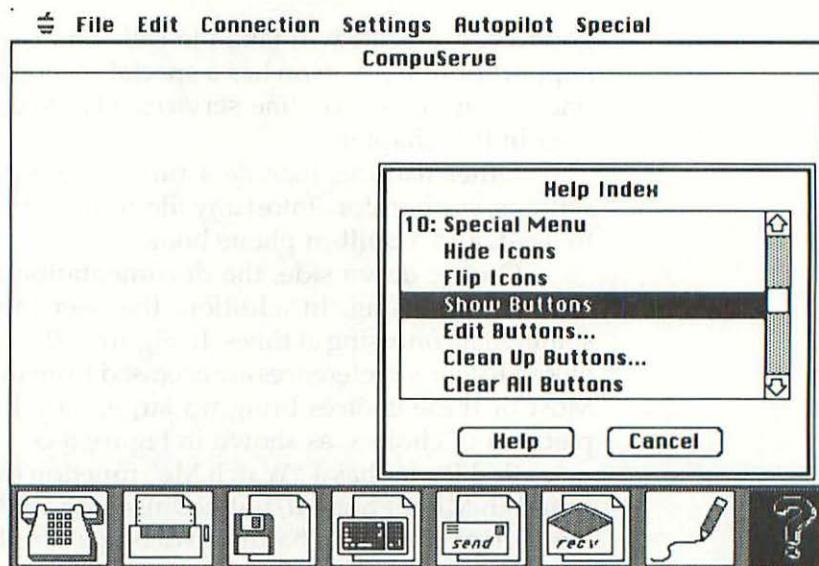
Figure 8–4
Smartcom II Has a
Graphical
Interface

MockTerminal MockTerminal, included with MockPackage Plus Utilities, is a desk accessory (DA) that allows you to perform simple telecommunication tasks. Because it's a DA, you can open it, dial with it, and send or receive text (or any Macintosh file) without leaving your application.

MockTerminal is a bare-bones package—it supports only XMODEM/MacBinary, has no terminal emulation, and has no scripting feature. Still, it's a handy way to log on to a remote computer and quickly send or receive a file.

Figure 8–5 shows MockTerminal's only menu, which displays all of its options.
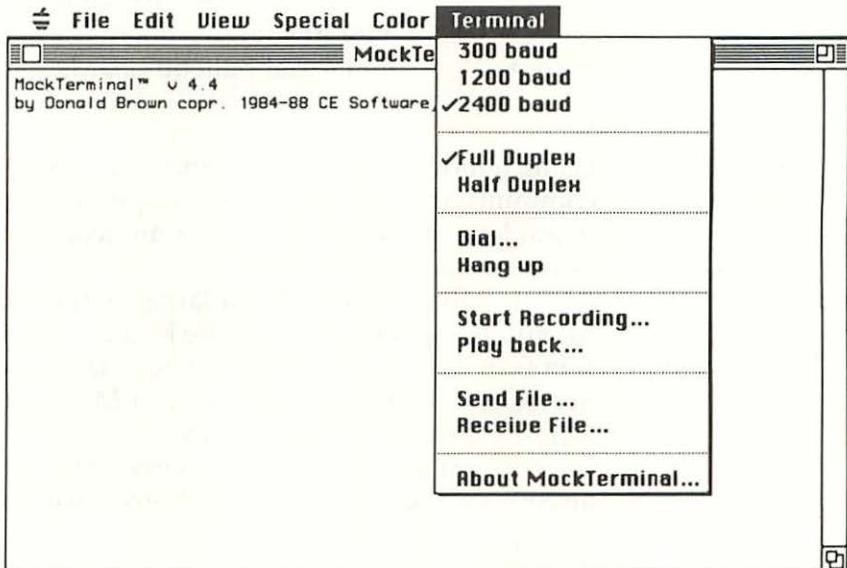
Figure 8–5
MockTerminal's
Only Menu

Which
Package
to Buy

I use MicroPhone and recommend it if you can afford it. If price is a factor in your decision, but you don't want to give up power, consider Red Ryder. It is almost as capable as MicroPhone, although it's harder to learn and master and its documentation leaves something to be desired. Its low price may more than make up for these shortcomings if you're on a budget. Smartcom II is an excellent compromise if you're looking for something that's extremely easy to use and you don't mind giving up some of the more advanced scripting features of Red Ryder and MicroPhone.

Places Your Modem Can Take You

Now that you've got a modem and telecommunication software, the next thing to do is find a reason to use them. There are many places you can go with your modem. It can connect you to:

- Other Macintoshes equipped with modems and tele-communication software
- Non-Macintosh computers, including minis, micros and mainframes, as long as they're equipped with modems and some sort of telecommunication software
- Commercial on-line services, such as CompuServe, GEnie, and MacNet
- Non-commercial bulletin boards

Communi-
cating with
Other
Computers

Using a modem and telecommunication software, your Mac can communicate with almost any computer equipped with the same. A modem can connect you to a minicomputer, microcomputer, or even a mainframe computer.

If your company has a large computer, it may be possible for you to log on from a remote location and download information from the big computer to your Mac; however, if you're connected to a computer other than a Mac, you will be limited to sending and receiving text only.

If you've connected to another Mac, you can send almost anything—text, formatted word processor files, graphics, or even an application or DA.

CompuServe

CompuServe is the granddaddy of on-line services. You can buy a starter kit (at most software stores or through MacConnection) that includes an account number, password, user's manual, and list of local phone numbers you can use to log on.

In operation almost 20 years, CompuServe is the largest and most complete service in the world. More than 400,000 users access it with a local phone call from more than 300 cities in North America and 79 foreign countries. The hourly charge for connecting to

CompuServe is the same, no matter when you use it. Other services, such as GEnie, have significantly higher charges for daytime usage.

CompuServe was designed for instantaneous communication and information retrieval in the home or office. Subscribers can choose from a selection of more than 1,000 subject areas, including information resources, communications, and transactional services.

Among the services offered are electronic mail, special-interest forums, real-time conferences, news, stock quotes and market information, weather, sports, travel, and electronic shopping.

The best reason for joining CompuServe, in my opinion, is to access the Macintosh forums—probably the finest collection of Macintosh minds ever gathered in one place.

There are six different Macintosh forums on CompuServe (complete descriptions of each are given later in this chapter). A *forum* is the electronic equivalent of a gathering place. There are message areas, where you can ask a question or share information with others, and data libraries that are filled with public domain and shareware programs. In each forum, the message areas and data libraries are subdivided into logical sections, making it easier to find what you're looking for.

One of the nicest features of the forums is that if you leave (also called posting or uploading) a message asking a question, you're notified automatically if you received any responses the next time you visit that forum. It's a great way to get answers.

The only cost to you is your connect charge. (Of course, if you use any of the shareware for more than a few days of trial, you should send the author the shareware fee. It's usually small— rarely more than $20.)

I heartily recommend the Mac forums on CompuServe. I log on to CompuServe and visit the Mac forums at least twice a day to find out what's going on in the Macintosh community, share ideas, ask questions, scan the data libraries, and say hello to my friends.

It's easy to use CompuServe, despite its old-fashioned command-line interface. It's menu-driven, and fairly easy to operate once you get the hang of it. Once you've dialed your local phone number and typed in your user ID and password, a series

of menus and prompts make CompuServe's incredible array of goods and services almost manageable. Although it takes some getting used to after the point-and-click simplicity of the Mac, it isn't all that complicated.

In Figure 8–6, the words that appear after the "!" prompts are those that I typed after accessing CompuServe. I first typed "Go Macintosh" to get to the Macintosh section, then typed "1" to enter the Macintosh Personal Productivity Forum.

Macintosh Forums (MAUG—Micronetworked Apple Users Group) The best part of CompuServe, at least for Macintosh users, is MAUG—the Micronetworked Apple Users Group on Compu-Serve. To get there, type "Go Macintosh" at any prompt. There are six forums dedicated to the Macintosh.

Each Macintosh forum is made up of two sections: messages and data libraries. Each of these sections is subdivided into 10–15 categories. Figure 8–7 shows the names of the subsections in the MacPro message section (top) and the MacPro data libraries (bottom).

```
CompuServe                    TOP

    1 Subscriber Assistance
    2 Find a Topic
    3 Communications/Bulletin Bds.
    4 News/Weather/Sports
    5 Travel
    6 The Electronic MALL/Shopping
    7 Money Matters/Markets
    8 Entertainment/Games
    9 Home/Health/Education
   10 Reference
   11 Computers/Technology
   12 Business/Other Interests

!go macintosh

CompuServe                MACINTOSH

MAUG (tm) MACINTOSH

    1 Personal Productivity Forum
    2 Arts and Entertainment Forum
    3 Business Users Forum
    4 Apple Developers' Forum
    5 Apple Vendor Forum
    6 Apple Hyper Forum
    7 Mac File Finder
```

Figure 8–6
CompuServe's
Main Menu and
the Main MAUG
Menu

```
MAUG (tm) MAC PRO Forum Sections Menu

Section names (#subjs/# msgs)
 1 Forum Business  (19/58)
 2 Community Square  (47/180)
 3 Programming  (7/20)
 4 Utilities  (21/57)
 5 DAs/FKEYs/INITs  (19/55)
 6 Software  (52/183)
 7 Hardware  (66/171)
 8 Telecommunications  (17/71)
 9 CIS Navigator  (37/109)
10 Mac II Software  (2/9)
11 Mac II Hardware  (14/47)
12 Desktop Publishing  (9/33)
13 "Early" Macs  (3/3)

MAUG (tm) MAC PRO Forum Libraries Menu

Libraries Available:
 1 Forum Business
 2 Community Square
 3 Programming
 4 Utilities
 5 DAs/FKEYs/INITs
 6 S'ware Aids/Addons
 7 Hardware
 8 Telecommunications
 9 CIS Navigator/VMCO
10 Mac II Software
11 Mac II Hardware
12 Desktop Publishing
13 'Early' Macs
14 Fonts
```

Figure 8–7
Message and
Data Library
Subsections in
MacPro

Let's take a quick look at the six different Macintosh forums (The words in parentheses after the name of each forum are what you type at any CompuServe prompt to get to that forum. A complete set of "Go" words, as well as other information on using CompuServe effectively, can be found in the user's guide you receive when you join.)

Macintosh Personal Productivity Forum (Go Macpro) For all Macintosh users. This forum is filled with messages about using and mastering hardware and software and has a data library packed with excellent public domain and shareware programs. It is also the frequent host of on-line conferences with industry notables such as John Sculley and Jean-Louis Gassée of Apple. At these conferences, you log on and can ask questions of these people in real time, just by typing. Conferences are publicized by an announcement message you see before you enter the forum. This is the busiest of the Macintosh forums.

Macintosh Arts and Entertainment Forum (Go Macfun)   This forum is just the thing for anyone hoping to discover new and creative ways to use the Macintosh. There are messages and sections about games, graphics, music, art, design, education, and more. There are also data libraries filled with music and images in MacPaint, PICT, EPS, and color formats, as well as public domain and shareware programs for manipulating music and image files.

Macintosh Business Forum (Go Macbiz)   This forum is for users in the business world. Here you'll be able to compare notes on database design and construction, desktop publishing, spreadsheets, networks, and other business-related activities with thousands of other business users. This forum's data library is filled with useful templates and examples of work done with most of the popular business software applications, as well as public domain and shareware programs helpful to business users.

Apple Developers' Forum (Go Appdev)   This one is for developers and programmers. Here you'll be able to communicate with other developers and compare notes on programming languages, debuggers, editors, and linkers. The data library contains tools for developers as well as technical notes on Apple products.

Apple Vendor Forum (Go Appven)   This is where vendors of Mac software and hardware answer questions about their products and provide on-line technical support. Vendors here include Acius, CE Software, Mainstay, Software Supply, Survivor Software, TOPS, and many more. The data libraries contain updates and hints on using each vendor's products as well as templates and samples.

Apple Hyper Forum (Go Apphyp)   This is the forum for HyperCard users. The message section is filled with tips and hints for using HyperCard, and the data library has thousands of stacks for downloading.

The message sections in each forum use a concept called *threads*. You can read a single message, or you can read a message and all its associated replies—a *thread*. You could also leave a reply and become part of the thread.

The people who use the Macintosh forums are among the best-informed Mac users I've ever known. They are happy to answer questions and help first-time users learn the ropes.

Sample Conversation (Thread) in Macpro Forum Let's look at how threads work. The following example shows a typical set of questions, responses, and replies to the responses. My comments appear in the same typeface as the text of this book.

In the example you will see "Person 1" or "Person 2" in the From or To fields; ordinarily, you'll see a person's real name. (The symbol "<CR>" always means type a carriage return.)

To get to the point where this example starts, I logged on, typed my account number and password at the appropriate prompts, then typed GO MACPRO at the main menu. After arriving in MACPRO, I selected the option to search for messages by keyword. In this case, the keyword was "Applecare." You can also search for messages by date or get a summary of all new messages since last time you logged on. In this example, I'm reading a thread about Applecare, which has six participants (only a few of them are included in this example).

The header, the first five lines of each message, tells you which subtopic you're reading (S1/Forum Business), the date, subject, and who the message is from and to. Every message contains these items.

```
#:   105161 S1/Forum Business
     10-Nov-88  02:46:22
Sb: #Applecare
Fm: Person #1
To: Person #2

I've always looked at insurance (and
things like AppleCare) as hedges or safety
nets. It isn't so much how many people
fall off the high wire, it's what happens
to those who do without a net.  After all,
```

```
the loss ratio is 100% to those people who
have the loss.   Remember the CPA who
drowned in a stream that was, on the aver-
age,  2 ft deep?

There is 1 Reply.
Press <CR> for next or type CHOICES !rr
```

I typed "rr" because I'm interested in reading the reply. If I wanted to read a different thread, I would have typed a carriage return (<CR>). Typing CHOICES would have allowed me to reread the message, reply to it, go on to another message, or return to this forum's main menu.

```
#:    105240 S1/Forum Business
      10-Nov-88   11:14:16
Sb:  #105161-#Applecare
Fm:  Person #3
To:  Person #1


An absurd statistic I like even better is
that the great majority of people have
more than the average number of legs.

There are 2 Replies.
Press <CR> for next or type CHOICES !rr
```

Courtesy of CompuServe, Incorporated

This is a reply from a new person, #3, to the originator of the first message, #1. Again, I typed "rr" so I can follow the responses.

As you can clearly see, the thread concept allows you to hold conversations, even though the other participants may be thousands of miles away.

In addition to the message sections, the forums also offer data libraries, which allow you to search for files using keywords. You can also see a list of all files if you like by selecting the "Directory of files" option.

How To Find a File in a Data Library Here's another example, which shows how you find a file or files in a data library. To get to the point where this example starts, I logged on and typed GO MACPRO as before, then selected data library 5, DAs/FKEYs/ INITs, from the data library menu (see the bottom of Figure 8–7, shown earlier):

```
MAUG (tm) MAC PRO Forum Library 5
DAs/FKEYs/INITs

 1 BROWSE thru files
 2 DIRECTORY of files
 3 UPLOAD a new file
 4 DOWNLOAD a File
 5 LIBRARIES

Enter choice !1
```

I typed 1 because I want to browse by keyword. Had I typed 2, I would have been asked how old was the oldest file I was interested in. After typing a number of days, I would have gotten a list of every file uploaded in that time period. Typing 3 or 4 would prompt me through the procedure to upload or download a file, and typing 5 would take me back to the library menu shown in earlier Figure 8–7.

```
Enter keywords (e.g. modem)
or <CR> for all: paint
```

I typed "paint." CompuServe will now search for files that have paint as their keyword.

```
Oldest files in days
or <CR> for all:
```

I typed a carriage return, because I want to search all of the files. Had I only wanted to search files uploaded in the last 90 days, I would have typed 90 instead of <CR>.

Here is the result of my search for files with the keyword "Paint," no matter how old they are:

```
[71121,3421]
DAFX32.SIT/binary          31-Oct-88 68480
67
```

Keywords: DAFX DA MACPAINT IMAGE PROCESS-
ING CONVERSIONS PAINT EFFECTS CONCEPTS
GRAPHIC

```
    DAfx 1.32, the super paint package in
a DA!  This version fixes a bug when used
with Suitcase II. DAfx has most of the
features of MacPaint plus a few of its
own. This stuffit file does *not* contain
the quick start guide or sampler.  They
will be uploaded seperately.  Keyware,
limited use until registered. -Jim, Mi
Concepts.  READ the docs in either
MacWrite or Word format.
```

Press <CR> for next or type CHOICES !

I typed a carriage return, so that I could see the next file that met my search criteria. Had I typed CHOICES, I would have been presented with a menu with options for downloading this file or returning to the forum's main menu.

```
[75206,2025]
PAINTR/binary              14-Feb-88 5888
278
```

Keywords: DESK ACCESSORY DA FULL SCREEN
PAINT VEIWER COPY SCROLL ZOOM
.MACPAINT FULLPAINT

```
    This is a picture viewer DA that views
a MacPaint/FullPaint document on the full
screen.  It is compatible with 512s,
Pluses, and SEs. Also works under DA FKEY
and SuitCase. Features include:  Zoom in/
out, scroll copy to clipboard, and start-
upscreen production.  Shareware.  This is
version 2.0.
```

```
     This fixes a small bug in the selec-
tion rectangle and now the copyright box
appears only once when running.  Still not
Mac II compatible, but that will be ver-
sion 3.0, which may include color.

Press <CR> for next or type CHOICES !
```

I'm still looking, so I again typed a carriage return.

```
[75226,2257]
COLMAP.SIT/binary            24-Jun-88 5888
379

Keywords: COLOR MAP CDEV PIXEL PAINT VER-
SION

     This is a color map to replace the B&W
map in the Map CDEV that comes with 6.0.
I created this by copying the map from the
CDEV (just click on the map and select
Copy from the edit menu). To replace your
map with my color version, download this
scrapbook file. First, using the Map CDEV,
locate Los Angeles and SET your position
there. Then click anywhere on the map (but
be sure text box isn't highlighted), copy
the color map from the clipboard and paste
into the Map CDEV.
     -mel

Press <CR> for next or type CHOICES !
```

I'm still browsing, so I once again typed a carriage return.

```
[76176,1457]
DSKPNT.SIT/binary            03-Nov-87 48896
164

Keywords: DA PAINT MACPAINT TIFF 300DPI
GRAPHICS DESKPAINT ZEDCOR GREY.SCALES
COMPLETE PA
```

```
    This  is  a  working  copy  of  the  new
DeskPaint  DA.  It  is  complete  except  for
SAVE  and  clipboard  related  functions.    It
edits  TIFF  and  MacPaint  and  lots  more.
This  is  an  incredible  program!    Requires
Stuffit  for  offline  decoding.

Press  <CR>  for  next  or  type  CHOICES  !
choices
```

Courtesy of CompuServe, Incorporated.

If I had wanted to, I could have continued typing carriage returns until I had seen all the files. Instead, I typed "choices" and returned to the forum's main menu.

All things considered, joining CompuServe and frequenting the Macintosh forums may be the best way to become a power user. Sure, reading this book is a good start, but what if you need help with something I haven't covered? The people who use CompuServe are nice, knowledgeable, and extremely helpful. But more than that, there are more power users hanging out on CompuServe than anyplace else I know. They'll be happy to answer your questions, and so will I. (All of my electronic addresses appear in the introduction to this book, if you care to drop me a note.)

The Rest of CompuServe There is more to CompuServe than just Macintosh information. In addition to the Apple forums, there are dozens of other computer forums, including Microsoft (publisher of Word, Excel, and Works—GO MSAPP), Aldus (publisher of PageMaker—GO ALDUS), and Adobe Systems (lots of fonts—GO ADOBE).

In addition to computer-related services, CompuServe offers an abundance of information on just about anything you need to know. Goods, services, information and much more, are just a local phone call away.

For example, you can arrange travel reservations—including airlines, hotels and rental cars,—and charge them to a major credit card, without leaving the comfort of your home or office.

The travel section on CompuServe includes the Official Airline Guide (GO OAG), American Airlines EasySabre travel reservation system (GO EAASY), the ABC Worldwide Hotel Guide, which features listings of over 28,000 hotels (GO ABC), as well as dozens of other travel-related sections.

Thousands of items, including cars, televisions, and computer hardware and software can be investigated on-line and ordered with a major credit card by shopping in CompuServe's Electronic Mall (GO MALL).

So far, you've seen that you can get many kinds of information as a CompuServe subscriber. But wait—there's more: you can send electronic mail to almost anyone in the world, using CompuServe's powerful electronic mail network, EasyPlex. For a small additional charge, you can have it sent through MCI Mail instead of EasyPlex (if the person doesn't have a CompuServe account) or sent to a FAX machine (GO EASY).

One of CompuServe's most powerful features is that you can query large databases for information on a wide variety of subjects. For example, there's a full text encyclopedia (GO EN-CYCLOPEDIA) that can be searched by keyword, a business demographics database (GO BUSDEM), Census bureau data (GO CENDATA), and IQuest, CompuServe's information retrieval service. IQuest provides access to more than 800 databases, including Dialog, BRS, NewsNet, and full text databases of hundreds of publications (GO IQUEST).

There is an additional charge for some services. You will see a "$" on each menu choice that has a surcharge. The charges range from a few pennies to several dollars per inquiry.

One of the surcharged areas is the stock market quote database (GO QQUOTE). It's relatively inexpensive: 7¢ an issue when the market is open, 2¢ when it's closed.

How to Check Stock Prices The following example shows the procedure for checking three stocks, Apple Computer, The Allen Group, and DuPont. At any CompuServe prompt, you type "GO QQUOTE" to enter the Quick Quote forum.

```
╔══════════════ Macintosh Personal Productivity Forum ══════════════╗
║                                                                    ║
║  ┌─────┐  ┌────────┐  ┌────────┐  ⊠ Enter    T  S  ⊠ Get Text/Summary: ║
║  │ OK  │  │ Cancel │  │ Forget │  ☐ Update   0 ☐ ☐  ··· none ···     ║
║  └─────┘  └────────┘  └────────┘             1 ☐ ⊠ Forum Business    ║
║                                              2 ☐ ⊠ Community Square   ║
║  ⊠ Get all my new messages                   3 ☐ ⊠ Programming        ║
║                                              4 ☐ ⊠ Utilities          ║
║  Get Msgs About:  ┌──────────────┐           5 ☐ ⊠ DAs/FKEYs/INITs    ║
║                   └──────────────┘           6 ☐ ⊠ Software           ║
║  Get Msgs From:   ┌──────────────┐           7 ☐ ⊠ Hardware           ║
║                   └──────────────┘           8 ☐ ⊠ Telecommunications ║
║  Get Msgs To:     ┌──────────────┐           9 ☐ ⊠ Telecom. Help      ║
║                   └──────────────┘          10 ☐ ⊠ Mac II Software    ║
║                              Get threads:   11 ☐ ⊠ Mac II Hardware    ║
║  Send Messages: 0                      ⇧    12 ☐ ⊠ Desktop Publishing ║
║  Send Replies: 0                            13 ☐ ⊠ "Early" Macs       ║
║     ┌───────────┐                           14 ☐ ··· none ···         ║
║     │ Messages… │                           15 ☐ ··· none ···         ║
║     └───────────┘   ┌────────┐              16 ☐ ··· none ···         ║
║     ┌───────────┐   │ Delete │         ⇩    17 ☐ ··· none ···         ║
║     │ Script…   │   └────────┘                                        ║
║     └───────────┘   ┌────────┐   ┌──────────┐                         ║
║  ▯·▤ │ Library…  │   │  Add   │   └──────────┘                        ║
║     └───────────┘   └────────┘                                        ║
╚════════════════════════════════════════════════════════════════════╝
```

```
╔════════ CompuServe Session Review – CompuServe Threads ════════╗
║ ▯□ Macintosh Personal Productivity Forum  ◐▨▨▨▨▨▨▨▨▨▨▨▨▨ ■ ▨ ◑ ║
║ ▦                                 GO MACPRO     Location       Message ║
║ ┌───────┐ ┌────────┐ ┌─────────┐ ┌────────┐ ┌───────┐┌──────┐ ┌───────┐┌──────┐ ║
║ │ Reply │ │ Create │ │ Archive │ │ Skip It │ │ Prior ││ Next │ │ Prior ││ Next │ ║
║ └───────┘ └────────┘ └─────────┘ └────────┘ └───────┘└──────┘ └───────┘└──────┘ ║
║ 106150●: MACazine editorial        S 2 / Community Square    1 reply    ⇧ ║
║ 106151:  Files busy outrage help   S 8 / Telecommunications  2 replies    ║
║ 106153:  Managing Your Money       S 6 / Software                         ║
║ 106154:  CIS and Files Busy...     S 2 / Community Square    1 reply      ║
║ 106155:  Nav Face Help             S 9 / CIS Navigator       2 replies    ║
║ 106156:  Disk Swap Help!           S 6 / Software                         ║
║ 106158:  Applecare                 S 1 / Forum Business                   ║
║ 106159:  Keeping Mac Cool.....     S 7 / Hardware                         ║
║ 106160:  Mac/LaserJet Connection   S 2 / Community Square                 ║
║ 106162:  Arnett leaving InfoWorld  S 2 / Community Square    1 reply      ║
║ 106164:  MacWrite Problem          S 6 / Software                         ║
║ 106165:  DEC supplies phone #?     S 7 / Hardware                         ║
║ 106166:  MacVision                 S 7 / Hardware            2 replies    ║
║ 106167:  Set Clock 1.8/HELP!       S 6 / Software                         ║
║ 106168:  Setclosk Help             S 6 / Software                         ║
║ 106169:  Anaheim WP Shootout       S 6 / Software                         ║
║ 106170:  WHY THE MAC?              S 2 / Community Square                 ║
║ 106172●: TOPS speed                S 6 / Software                         ║
║ 106173:  Check it.out              S 2 / Community Square               ▯ ║
╚════════════════════════════════════════════════════════════════╝
```

You can use Navigator to search the data libraries just as easily as I've searched for messages in the examples above.

Navigator makes using CompuServe even easier and will save you a lot of money if you use CompuServe frequently. I've found it's cut my on-line time in half—I spend half as much time typing back and forth with CompuServe, and as a result, my bill is about 50-percent lower. Incredibly, I'm getting twice as much use out of CompuServe since switching to Navigator. It's gotten to the point where I won't use MicroPhone to log on anymore.

The travel section on CompuServe includes the Official Airline Guide (GO OAG), American Airlines EasySabre travel reservation system (GO EAASY), the ABC Worldwide Hotel Guide, which features listings of over 28,000 hotels (GO ABC), as well as dozens of other travel-related sections.

Thousands of items, including cars, televisions, and computer hardware and software can be investigated on-line and ordered with a major credit card by shopping in CompuServe's Electronic Mall (GO MALL).

So far, you've seen that you can get many kinds of information as a CompuServe subscriber. But wait—there's more: you can send electronic mail to almost anyone in the world, using CompuServe's powerful electronic mail network, EasyPlex. For a small additional charge, you can have it sent through MCI Mail instead of EasyPlex (if the person doesn't have a CompuServe account) or sent to a FAX machine (GO EASY).

One of CompuServe's most powerful features is that you can query large databases for information on a wide variety of subjects. For example, there's a full text encyclopedia (GO EN-CYCLOPEDIA) that can be searched by keyword, a business demographics database (GO BUSDEM), Census bureau data (GO CENDATA), and IQuest, CompuServe's information retrieval service. IQuest provides access to more than 800 databases, including Dialog, BRS, NewsNet, and full text databases of hundreds of publications (GO IQUEST).

There is an additional charge for some services. You will see a "$" on each menu choice that has a surcharge. The charges range from a few pennies to several dollars per inquiry.

One of the surcharged areas is the stock market quote database (GO QQUOTE). It's relatively inexpensive: 7¢ an issue when the market is open, 2¢ when it's closed.

How to Check Stock Prices The following example shows the procedure for checking three stocks, Apple Computer, The Allen Group, and DuPont. At any CompuServe prompt, you type "GO QQUOTE" to enter the Quick Quote forum.

```
!GO QQUOTE

One moment please...

Quick Quote
QQUOTE
Quotes are delayed over 15 minutes.  Com-
puServe does not edit this data and is not
responsible or liable for its content,
completeness, or timeliness.


DOW 30 was down 47.65 on 11/11


Quotes are surcharged (7 cents each if the
market is open, 2 cents if closed).


Enter ticker symbols (i.e. HRB,SP 500), an
asterisk followed by beginning of a com-
pany name (i.e. *BLOCK), /H for HELP or /
EXIT.

Issue: AAPL,ALN,DD
```

Here I entered the ticker symbols from the daily newspaper for the three stocks I'm interested in: Apple Computer (APPL), The Allen Group (ALN), and DuPont (DD). If I didn't know the symbol for one of them, I could type an asterisk before the company name (for example, *Apple) instead of the ticker symbol.

What follows is the result of the above query, for three different days—November 7, 8, and 12:

```
These are the stock prices for November 7, 1988 at 3:51 PM:
•— QuikQuote, 11/7/88, 3:51:44 PM —•
Name                     Volume    Hi/Ask   Low/Bid    Last  Change  Update

APPLE COMPUTER INC        15179    37.750    37.000  37.500  -0.250    4:00
ALLEN GROUP INC              50    13.875    13.625  13.875  -0.250    4:03
DU PONT E I DE NEMOURS &    5345    83.000    82.250  82.250   0.250    4:00

These are the stock prices for November 8, 1988 at 7:00 PM:
•— QuikQuote, 11/8/88, 7:00:38 PM —•
Name                     Volume    Hi/Ask   Low/Bid    Last  Change  Update

APPLE COMPUTER INC        13718    38.750    37.375  38.500   1.000   11/08
ALLEN GROUP INC              67    13.875    13.625  13.625  -0.250   11/08
DU PONT E I DE NEMOURS &    3285    82.500    81.625  81.875   0.625   11/08
```

```
These are the stock prices for November 12, 1988 at 10:20 AM:
•— QuikQuote, 11/12/88, 10:20:23 AM —•
Name                              Volume    Hi/Ask    Low/Bid    Last    Change    Update

APPLE COMPUTER INC                  9717    39.625    38.500    38.500    -1.000    11/11
ALLEN GROUP INC                       98    13.750    13.500    13.500    -6.250    11/11
DU PONT E I DE NEMOURS &            5741    82.250    80.000    80.000    -2.250    11/11
Issue: /Exit
```

Courtesy of CompuServe, Incorporated.

CompuServe offers many other services for investors and speculators. The user guide you receive with your subscription has complete details on them.

CompuServe Navigator CompuServe also offers an excellent software package, called CompuServe Navigator which provides Macintosh owners with almost total automation. It runs on any Mac newer than a 512Ke, and is designed to save you time and money. It does this by letting you decide what information you want before you log on (that is, before the meter starts running).

Navigator lets you log on, get lists of new messages and files from almost any forum, then log off and decide what you want to read or download. You simply double-click your choices, then log back on. Navigator does all the work. In all of the following illustrations I was off-line. That means I was deciding what interested me without having to pay the hourly charge. Without Navigator, you'll spend a lot more time and money getting around CompuServe.

Figure 8–8 shows the set-up dialog box for the Macintosh Personal Productivity Forum (MACPRO). I've instructed the Navigator to enter this forum and get text summaries of messages in subtopics 1–13. After making my selections, I instruct Navigator to run the session with a menu selection called "Run."

Figure 8–9 shows the result of the run I set up in Figure 8–8. It's a summary of messages from all of the subtopics in MACPRO that I selected in Figure 8–8. I've double-clicked the two with bullets, "MACazine Editorial" and "TOPS speed." The complete text of these messages will be captured the next time I log on, as shown in Figure 8–10.

After I log on again, Navigator retrieves the messages I'm interested in and makes it simple to send a reply. All I do is click the reply button and type in my text. The next time I log on, my reply will be sent automatically to "A CompuServe User."

```
▓▓▓▓▓▓▓▓▓▓▓ Macintosh Personal Productivity Forum ▓▓▓▓▓▓▓▓▓▓▓
                                     T  S  ⊠ Get Text/Summary:
 (   OK   )  ( Cancel )  ( Forget )  ⊠ Enter   0□ □  ⋯ none ⋯
                                     ⊠ Update   1□ ⊠ Forum Business
 ⊠ Get all my new messages                     2□ ⊠ Community Square
                                               3□ ⊠ Programming
 Get Msgs About: [                    ]        4□ ⊠ Utilities
                                               5□ ⊠ DAs/FKEYs/INITs
 Get Msgs From: [                     ]        6□ ⊠ Software
                                               7□ ⊠ Hardware
 Get Msgs To:   [                     ]        8□ ⊠ Telecommunications
                                               9□ ⊠ Telecom. Help
 Send Messages: 0         Get threads:        10□ ⊠ Mac II Software
 Send Replies: 0                        ⬆     11□ ⊠ Mac II Hardware
                                              12□ ⊠ Desktop Publishing
        ( Messages... )                       13□ ⊠ "Early" Macs
                                              14□ □  ⋯ none ⋯
        (  Script...  )  ( Delete )      ⬇    15□ □  ⋯ none ⋯
                                              16□ □  ⋯ none ⋯
 □·🖫  (  Library...  )  (  Add   )           17□ □  ⋯ none ⋯
```

Figure 8-8
Telling Navigator
What Forum
Subtopics Interest
You

```
▓□▓▓▓▓ CompuServe Session Review - CompuServe Threads ▓▓▓▓▓
 ▓▓▓ Macintosh Personal Productivity Forum  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
 🖥                            GO MACPRO    Location        Message
 ( Reply ) ( Create ) ( Archive ) ( Skip It )  ( Prior )( Next )  ( Prior )( Next )
 106150●  MACazine editorial         S 2 / Community Square   1 reply     ⬆
 106151:  Files busy outrage help    S 8 / Telecommunications  2 replies
 106153:  Managing Your Money        S 6 / Software
 106154:  CIS and Files Busy...      S 2 / Community Square   1 reply
 106155:  Nav Face Help              S 9 / CIS Navigator      2 replies
 106156:  Disk Swap Help!            S 6 / Software
 106158:  Applecare                  S 1 / Forum Business
 106159:  Keeping Mac Cool.....      S 7 / Hardware
 106160:  Mac/LaserJet Connection    S 2 / Community Square
 106162:  Arnett leaving InfoWorld   S 2 / Community Square   1 reply
 106164:  MacWrite Problem           S 6 / Software
 106165:  DEC supplies phone #?      S 7 / Hardware
 106166:  MacVision                  S 7 / Hardware           2 replies
 106167:  Set Clock 1.8/HELP!        S 6 / Software
 106168:  Setclosk Help              S 6 / Software
 106169:  Anaheim WP Shootout        S 6 / Software
 106170:  WHY THE MAC?               S 2 / Community Square
 106172●  TOPS speed                 S 6 / Software
 106173:  Check it.out               S 2 / Community Square
```

Figure 8-9
The Summary
Resulting from the
Requests Made in
Figure 8-8

You can use Navigator to search the data libraries just as easily as I've searched for messages in the examples above.

Navigator makes using CompuServe even easier and will save you a lot of money if you use CompuServe frequently. I've found it's cut my on-line time in half—I spend half as much time typing back and forth with CompuServe, and as a result, my bill is about 50-percent lower. Incredibly, I'm getting twice as much use out of CompuServe since switching to Navigator. It's gotten to the point where I won't use MicroPhone to log on anymore.

```
▤▢▭▭▭▭ CompuServe Session Review - CompuServe Threads ▭▭▭▭
┌────┐ Macintosh Personal Productivity Forum   ◙▦▦▦▦▦▦▦▦▦▦▦▦□▦▦▦▦▦▦▦▦▦▦▦◙
│    │                        GO MACPRO        Location    │    Message
└────┘ ┌────────┐┌────────┐┌─────────┐┌──────┐┌──────┐┌──────┐┌──────┐┌──────┐
       │ Reply  ││ Create ││ Archive ││ Get 11││ Prior││ Next ││ Prior││ Next │
       └────────┘└────────┘└─────────┘└──────┘└──────┘└──────┘└──────┘└──────┘
  ▪: 106150 S2/Community Square
      13-Nov-88  11:40:48
  Sb: MACazine editorial
  Fm: A CompuServe User (Acct ▪ withheld)
  To: LeVitus/MACazine 73537,1217

  Bob:

  Dunno if they're going to rule out polybag altogether; just for the bundling of
  catalogs, which is of course the only reason for doing it in the first place.
  Arrgh.

  Also been meaning to tell you how much I enjoy the Box of Rain column in the
  MACazine.  It was especially good and helpful when I was only an egg with this
  Mac stuff, and remains one of the high points of the mag even now.

  See you in Vegas...
```

```
  ┌────────┐┌────────┐┌─────────┐                      ☐ EasyPlex ☐ Private
  │ Cancel ││ Forget ││ Subject │
  └────────┘└────────┘└─────────┘
  Dear User,

  Glad you like Box of Rain. You might want to drop 'ol Mike a note. He's always
  interested in feedback on BOR, good or bad. I know he's here but don't know his
  PPN offhand.

  I wish we could afford to use the polybags just to protect the magazine from
  the elements (Read: US Postal Service.) But it's just too darn expensive. We
  only do it when we have a bundled catalog, so if the PO prohibits bundling,
  we'll probably abandon the bags.

  I won't be doing Vegas this year. I'll see you at MacWorld Expo San Francisco
  in January.

  Bob
```

Figure 8-10
Replying to a
Message Using
Navigator

Navigator is available directly from CompuServe. You can call them to order a copy or download it and be billed on your credit card. Just type "Go Order" at any prompt.

Other On-line Services

GEnie GEnie is another large on-line information system, with thousands of subscribers, though not nearly as many as CompuServe. Its chief attraction is that it is significantly cheaper than CompuServe for non-prime time use (that is, use between 6PM and 8AM). But you'll have to log on in the evening to take advantage of the lower rate—if you log on in the daytime, the rates are substantially higher.

GEnie uses a command-line interface similar to CompuServe's and has much of the same stuff as CompuServe—electronic mail, computer forums, encyclopedia, business news, etc.—only less of it.

Unfortunately, the message sections aren't arranged in threads. Instead, GEnie organizes messages into "Categories" and

"Topics." I think threads make it easier to follow an on-line conversation—you have to pick and choose what to read on GEnie. Also, message traffic on GEnie is lighter than on CompuServe.

Finally, GEnie doesn't offer a Macintosh software package like Navigator. (A package called MacGEnie became available too late for testing. It may make using GEnie easier.) Personally, I find the combination of CompuServe and Navigator much easier to use than GEnie. Still, if all you want to do is download public domain and shareware programs in the evenings, GEnie may be the least expensive way to go.

The crowd on GEnie is friendly and knowledgeable. They have a well-stocked library of shareware and public domain software and are eager to help first-time users.

MacNet   MacNet is the newest on-line service, with over ten thousand subscribers. It was designed specifically for use with the Macintosh, so it requires special software to log on. MS DOS support was recently added, so the subscriber base will probably grow more rapidly in the future.

I must say the Macintosh software supplied by Connect is
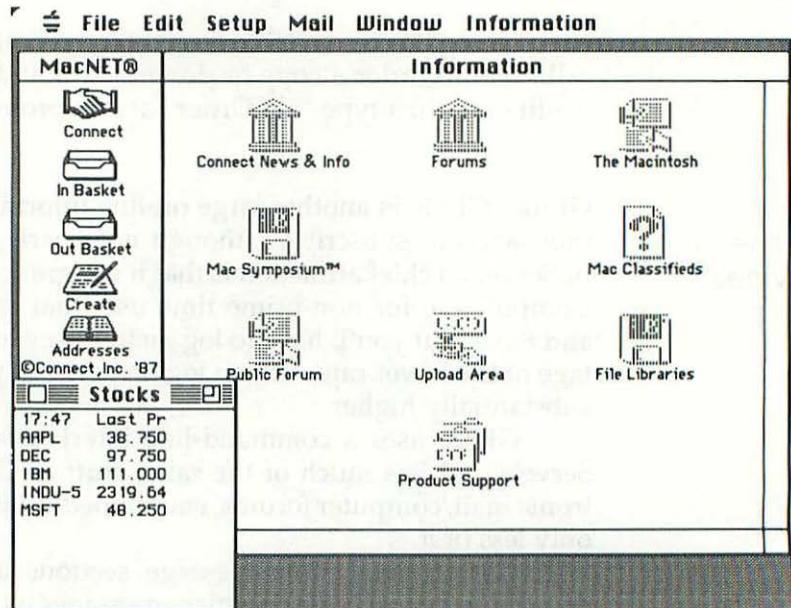
Figure 8-11
The MacNet
Software Interface

extremely easy to use. Figure 8–11 shows the MacNet interface. Just double-click an icon and a window will open, as in the Finder, allowing you to examine files or messages stored in that particular area.

MacNet, like CompuServe and GEnie, features electronic mail, information forums, product support and stock information. Its prices are lower than those of CompuServe or GEnie.

Again, the lack of threads makes using the message sections awkward, at least for conversations. (Flash: a phone call made after this section was written revealed that Connect is planning to add threads in the summer of 1989). You can post public messages, and other MacNet subscribers can easily reply to them. The problem arises when you want to follow all of the responses to a message; MacNet doesn't currently offer an automatic way of reading through them. That shortcoming is almost made up by MacNet's ease of use, which is due to its extremely Mac-like point-and-click interface. MacNet is probably the least expensive on-line service. Another bonus: you don't need any software but the MacNet software you get when you sign up.

The people who hang out on MacNet are a nice, helpful bunch. They are friendly and glad to help if you're just learning.

BBS's (Bulletin Boards)

A BBS (Bulletin Board System) is a smaller version of the on-line services discussed earlier. They are called *bulletin boards* because they operate like an electronic version of the traditional bulletin board. Many bulletin boards cost nothing beyond the cost of the phone call; others have a small annual charge for access—you pay it and receive a password for that BBS.

Most BBS's are run by *sysops* (System Operators) who, for the most part, are doing it for fun, not money. Better systems offer electronic mail, messaging, and downloading of shareware and public domain programs. There are literally thousands of bulletin boards in the U.S. The best lists of BBS's, surprisingly, can be found on CompuServe, GEnie, or MacNet. Try a keyword search for "BBS" or "bulletin" in one of the telecommunication data libraries. Another good way to find a BBS is to ask your local user group—many of them even operate a BBS of their own.

Try to find a good bulletin board near you and check it out. You'll know it's good if the messages are interesting and the download libraries are large. The quality of BBS's ranges from exceptional to not-worth-the-phone-call. Most larger cities have at least one great Mac-oriented BBS.

Utility Software for Telecommunication

Stufflt

If you're going to get involved in telecommunication, you need to know about a shareware program called StuffIt. StuffIt is a file archive utility that is commonly used to reduce the size of uploaded files. An *archive*, in this sense, is a single file created by StuffIt that contains one or more Macintosh files.

The big advantages of StuffIt are that it reduces the time needed to download or upload files by compressing all of the files in the archive and that it allows a group of related files to be combined in a single archive.

Figure 8–12 shows an archive called An FKEY.SIT, which contains three files—an FKEY, a CDEV, and documentation.
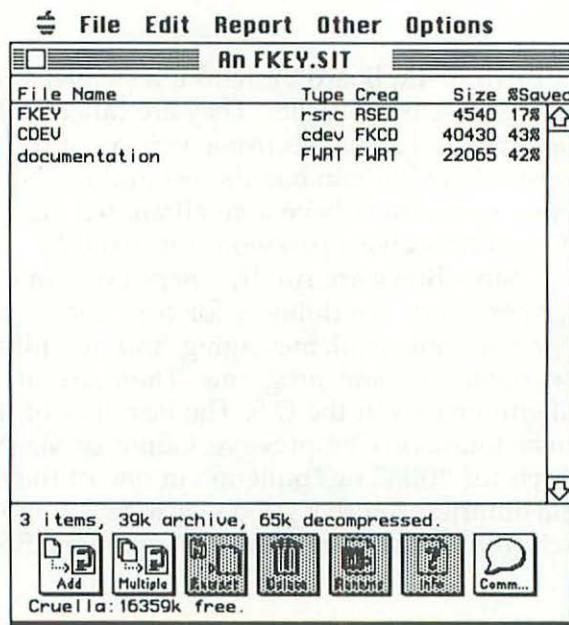
Figure 8–12
A StuffIt Archive

The suffix ".SIT" is commonly used to refer to an archive created with StuffIt. Notice that the archive's size is only 39K, whereas the combined size of the three files before archiving was 65K. So to download all three files, I downloaded one archive, 39K in size, then used StuffIt to extract the three files.

StuffIt is shareware and is available from all of the usual places.

Recommendations

A modem is your magic carpet to the world. There are many brands available, too many to mention here. The software I recommend is listed below.

Telecommu-
nication
Software

MicroPhone II
Software Ventures
2907 Claremont Avenue, Suite 220
Berkeley, CA 94705
415–644–3232
Approximately $300
512Ke, Plus, SE, II, IIx, SE/30
Requires System 4.1 or later.

Strengths:
- Good balance between ease-of-use and powerful features
- Support for many non-standard (that is, not 100-percent Hayes-compatible) modems
- Easy-to-use script/automation editor
- VT-100 and TTY emulation for communication with mainframe and minicomputers
- Excellent documentation

Weaknesses:
- Most expensive

MicroPhone II is the program I use most frequently for telecommunications with services other than CompuServe and MacNet (for which I use Navigator and the MacNet software, respectively). It's excellent, but it's also quite expensive. If your budget permits, MicroPhone II is a choice you won't regret.

Red Ryder

The FreeSoft Company
150 Hickory Drive
Beaver Falls, PA 15010
412–846–2700
Approximately $80.00
512K, 512Ke, Plus, SE, II, IIx, SE/30

Strengths:
- Low price
- Support for many protocols
- Powerful automation features and procedural language
- Phone book
- Excellent technical support on GEnie and by phone, often by program author Scott Watson

Weaknesses:
- Documentation that is often vague and confusing
- Ugly and unwieldy interface
- Complicated procedure automation, especially for beginners

Smartcom II

Hayes Microcomputer Products
P.O. Box 105203
Atlanta, GA 30348
404–449–8791
Approximately $150
512K, 512Ke, Plus, SE, II, IIx, SE/30

Strengths:
- Easiest to learn
- Slick icon-driven interface
- Excellent on-line help
- Good documentation and technical support
- Reasonable price

Weaknesses:
- Significantly less powerful than MicroPhone II or Red Ryder

MockPackage Plus Utilities (includes MockTerminal)
CE Software
P.O. Box 65580
West Des Moines, IA 50265
515–224–1995
Approximately $50
512Ke, Plus, SE, II, IIx, SE/30

In addition to MockTerminal, MockPackage Plus Utilities also includes:

- MockChart—a capable DA for creating charts
- MockWrite—a text-editing DA
- MockTerminal—a DA that lets you telecommunicate
- MockPrinter—a spooler for ASCII text files
- Control-1—a CDEV that lets you choose what CDEV is on top of the scrolling list when the Control Panel is opened
- EZ-Menu—an INIT that causes your menus to pull down when you place the mouse over them, even if you don't click
- Widgets and LaserStatus—a potpourri of utility functions

On-line
Services

CompuServe
5000 Arlington Centre Boulevard
Columbus, OH 43220
614–457–8600

GEnie
401 North Washington Street
Rockville, MD 20850
800–638–9636
301–251–6475

Connect, Inc/MacNet
10101 Bubb Road
Cupertino, CA 95014
800–262–2638
408–973–0110

Utility
Software

StuffIt
Raymond Lau
100–04 70 Avenue
Forest Hills, NY 11375

StuffIt is shareware and should be available from any on-line service or user group. If you are unable to find it elsewhere, it is also available directly from the author for about $20.

Summary

By all means get yourself a modem and communications software. A Mac without a modem is an island. A modem makes you a part of a network of power users and gives you access to a treasure trove of public domain and shareware programs.

CompuServe is the greatest communications service. After three years of frequent telecommunication, I've come to realize that CompuServe offers me more of what I telecommunicate for—more members, more messages each day, and more files in its libraries. GEnie and MacNet are nice, but you get more for your money on CompuServe.

Use your modem to get help with software or to get a recommendation from someone who's already made the purchase. Whenever I need an answer, I post my question on CompuServe or MacNet. The next day (sometimes within hours) there are always one or two helpful responses.

9

What Other Power Users Think You Should Know

Tips, hints, and advice from power users all over the world.

When I began to work on this book, I knew there was little chance of my remembering everything I've learned about the Mac over the past few years. So I enlisted the help of friends, acquaintances, and just about anybody with a Mac and a modem who would listen.

As I told you in the previous chapter, using a modem to get information is the greatest thing since sliced bread. So, because the folks who hang out on CompuServe, GEnie, and MacNet are so nice and know so much, I enlisted their help.

I logged on to each of the services and left the following message in the public message area:

Fellow telecommunicator:

Thank you for reading this message. For those of you who don't know me, allow me to introduce myself: my name is Bob LeVitus. I'm currently the Editor-in-Chief of MACazine, C. E. O. of STAX! and the soon-to-be-published author of a book entitled "Dr. Macintosh: Tips, Techniques and Advice for Mastering Your Macintosh" (Addison-Wesley, Spring 1989). Which is what this message is about.

I hope to include a section called "What Other Power Users Think You Should Know." That's where the part about being famous comes in.... If you're reading this, you are probably a pretty advanced Macintosh user. You know how to use a modem to get help with your Macintosh. That makes you just the kind of person this book's reader wants to hear from.

I don't know everything. And most of what I know, I learned here. Which is why I'm asking for your help.

Here's the deal: I need some great power user hints. This book is aimed at the beginning-to-intermediate Macintosh user. If that described your best friend, what would you teach him or her? Anything that helps someone do something better, faster or more elegantly is eligible. If you have a favorite hint or shortcut, submit it.

What is the most valuable thing you could teach another Macintosh owner?

Submit your best power user tip (or tips).
In return, if I use it in the book, you'll
get to be famous for 15 minutes (give or
take, depending how long it takes to read
your submission...). I'll also mention which
electronic service you used to communicate
it, so readers will get a feel for the kind
of people who hang out here. And, I'll send
you an autographed copy, inscribed any way
you like.

I'd appreciate it if you would post your tip
here, in the public forum, so everyone can
share it for now. I'll also need your mail-
ing address and a daytime phone number. Feel
free to send those by private mail if you
like.

Thanks for your help.

Bob LeVitus

*I expected to get some good hints and tips, but I never expected
the response I got—more than 200 tips and hints were submitted in the
two months after I posted the original message. And the quality of the
tips was outstanding! Even after removing duplicates, almost 100 tips
made the cut, and they appear in this chapter. Reading through them for
the first time was fascinating. There was so much I didn't know, and so
much that I'd forgotten.*

*This chapter is structured a little differently from the others. There
are a lot of hints and tips, organized into several categories. Each hint is
credited to its author. The name of the telecommunication service they
used to send the tip appears in parentheses. I've added graphics any-
where I felt they were appropriate, and my comments appear in italic
type to set them off from the words of others.*

*There are so many gems and so few clunkers, I suggest you read
the whole thing. Even the parts that don't interest you today. You never
know when that obscure bit of Mac information will come in handy.
Tuck it away for future reference.*

It was hard to categorize all of this information, but I did manage to instill some sense of order. The material is broken down into nine categories:

- *Shortcuts*
- *Backing up*
- *System software*
- *Shopping*
- *Hardware*
- *Software*
- *Printing/typesetting*
- *Potpourri*
- *The Last Resort of Power Users Everywhere: RTM*

You'll find "Potpourri" is the longest section; I used it as a repository for anything that didn't exactly fit elsewhere.

Before we get started, I want to take a moment to thank the members of the on-line community who helped out. Thanks! Your autographed copy is on the way!

Now, on to the best advice you can get—what other power users think you should know:

Shortcuts

Using Finder/
MultiFinder

Here are a couple of shortcuts I can think of for using Finder/MultiFinder: hold the Command key in Finder when dragging an icon to "grid" the drag. How about holding the Option key when you quit an application so that the Finder closes all of the open windows to avoid clutter? One of the best tips I can think of is one a lot of people don't use: In the Finder you use the DA Find File to locate a file that you want to browse or print. Select the "Move to Desktop" option, then double-click the document to open it or select Print from the file menu to print it from the Finder. When you're done, just select the document icon on the Finder and choose "Put Away" from the File menu. The document will be put back whereever it was. This is a great time-saver when a document is five or ten levels deep in your hard disk, as is often the case with a large disk or a system with many users.

Craig Blackstone (GEnie)

P.S. You can reset the interleave on a hard disk (dangerous!) in HD SC Setup version 2.0 *(found on Apple System Tools)* by pressing Command-I at the menu before you choose Initialize.

- ◊ -

1. If you hold down the Option key while opening folders to get to the one that contains the application *(or document)* you want, these folders will be closed automatically when you quit from the application. *(Doesn't work if you're running under MultiFinder.)*
2. Holding down the Command key while dragging icons will make them snap to position as if you had chosen the Clean Up menu item.
3. Holding down the Option key while pulling down the Special menu will replace the "Clean Up Selection" item with "Clean Up," which affects the whole active window, not just selected icons.
4. You may change the current System disk by double-clicking on the Finder icon for the disk you want to become active while holding down the Command and Option keys. Using the above technique, you can make a Finder on a floppy disk the active one, then drag the hard disk to the trash. The hard disk will not be harmed at all and no files will be lost, but no one will be able to tamper with the hard disk without restarting.

Ken Hadford (MacNet)

Selecting Clean Up with the Option key held down also does a more thorough clean up, moving icons into any empty spaces in the visible portion of the window. Without the Option key, icons will just move to the nearest unoccupied grid point. In Figure 9–1, you can see the effect of a regular clean up (top right) and an Option key clean up (bottom center).

- ◊ -
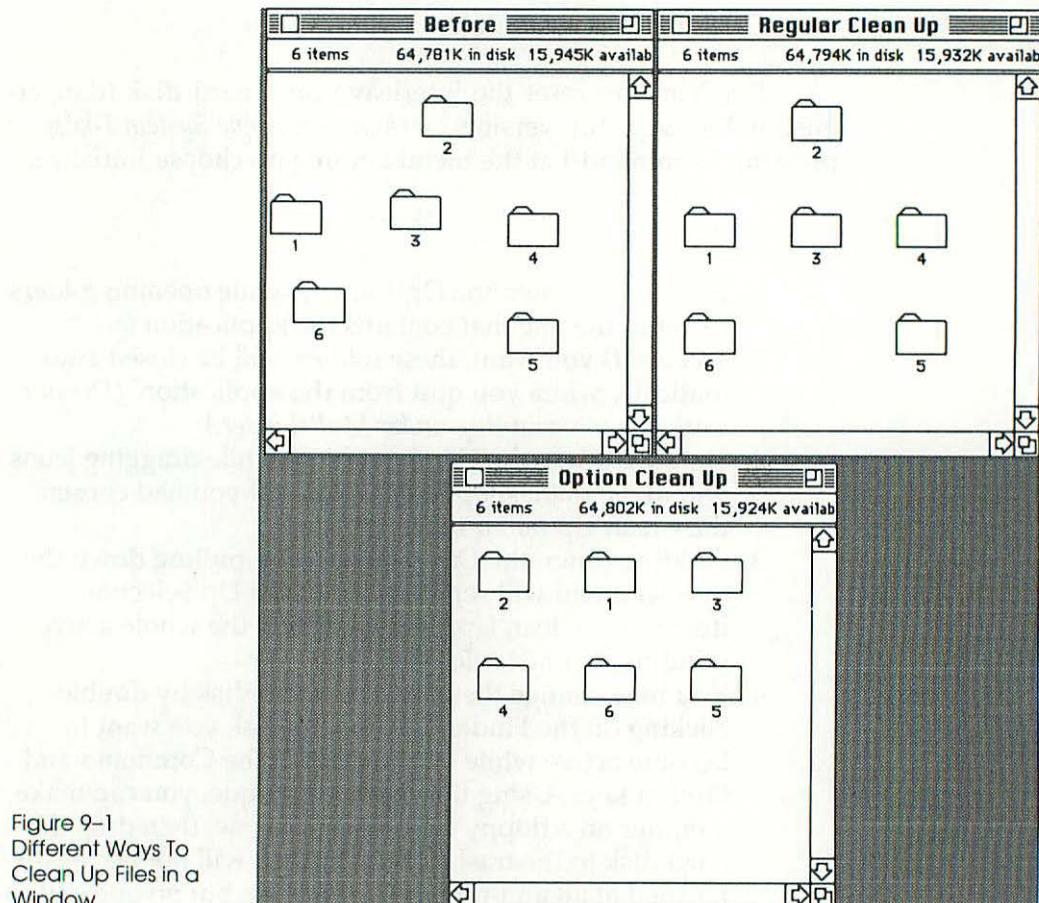
Figure 9-1
Different Ways To
Clean Up Files in a
Window

This is probably a little thing, but I personally love using the Command-Option-double-click combination on the Finder icon to change start-up disks.

Anne Inda (GEnie)

- ◊ -

I like to use Anne's trick to switch to MultiFinder when I've launched under the Finder. Just use the Command-Option-double-click combination on MultiFinder and you're launched. Now if I could just find a way to go back without restarting?

Jon Barry (GEnie)

- ◊ -

If you can get someone to tell you how to line up the icons in a desktop so that they're staggered instead of in a straight line with titles overlapping, I'll *buy* the book—heck, I'll buy two copies! I did it once, but can't remember how for love or money.

Anne Inda (GEnie)

No problem, Anne: To get the icons on the desktop to line up so they're staggered, you can either use ResEdit to change the vertical phase of the large icon, or use Layout 1.7 (freeware) to change the icons' spacing. Layout is much easier and allows you to turn on "grid drags" so whenever you move an icon, it lines up with the grid. Keeps things neat and tidy. It also allows you to change the default view for new folders, adjust small icon spacing, and much more. It's a wonderful little piece of freeware.

By the way, you won't have to buy the book. Looks like you'll be getting an autographed copy for your changing start-up disks tip.

Bob LeVitus

- ◊ -

Another Finder option is the ability to hold the Option key and drag a file to another folder. Finder will copy the file to the new location.

Norm Goodger (MacNet)

- ◊ -

Under MultiFinder, you can hold down the Option key, and a DA will open into the application layer.

Norm Goodger (MacNet)

A good hint. If you're a MultiFinder user, you probably know that when you select a desk accessory from the Apple menu, it opens in its own layer, called the DA layer. If you click in the window of any currently open application (or use any of the other methods of switching between programs under MultiFinder) the DA layer will become inactive.

If you're wondering why you might want to open a DA into the application layer rather than the DA layer under MultiFinder, it sometimes helps when you get the "Not enough memory" message or when the DA won't open in the DA layer for whatever reason.

Which brings us to another hint: To get better results when launching DAs from the application layer, you should increase the Application Memory Size of any application you'll be using when you plan to use the DAs. Another reason to increase the Application Memory Size is when an application complains: "Not enough memory to...." If you have a little RAM to spare, try it.

To change the Application Memory Size of a program, select the application's icon with MultiFinder on and the application closed. Press Command-I or select Get Info from the File menu. If you can spare the RAM, it's best to give it at least 100K more than it suggests. In Figure 9–2, I've increased Word's memory allocation from the recommended 384K to 512K. This allows me to have more and/or larger documents open and also gives me the flexibility to open DAs in the Application layer by holding down the Option key when I select them.

Another way to get memory-hungry DAs to open, which also helps if your screen freezes when you use DAs, requires the use of ResEdit.

Remember, ResEdit is a powerful utility with the capability to destroy files. Always make a backup of the file or files you plan to work on—NEVER USE RESEDIT ON YOUR ONLY COPY OF ANYTHING!

Here's what to do after making a copy of DA Handler and putting it in a folder other than the System Folder:
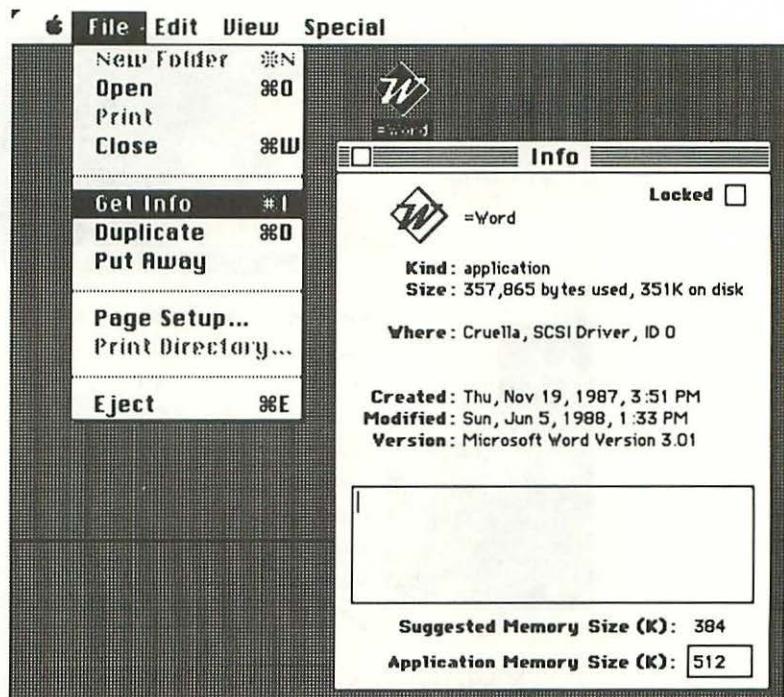
Figure 9–2.
Increasing the
Application
Memory Size

1. *Launch ResEdit.*
2. *Open DA Handler by double-clicking (it should be in your System Folder).*
3. *Open "SIZE" by double-clicking.*
4. *Open "SIZE ID =-1" by double-clicking.*
5. *Scroll to the very bottom of the dialog box.*
6. *Change the Size (NOT the "Min size") from the default of 16000 to 80000.*
7. *Close all of the windows and say Yes when asked if you want to save changes.*
8. *Reboot.*

Figure 9–3 shows the result of steps 1–6.
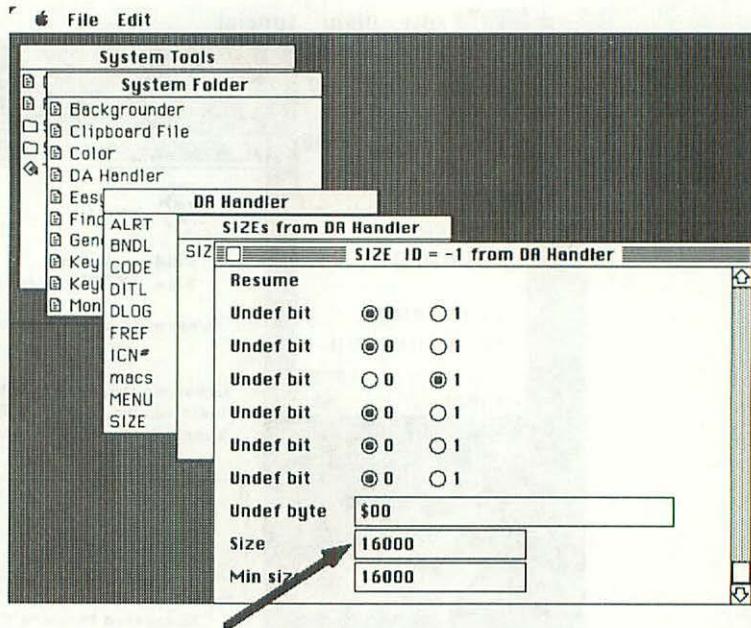
Figure 9–3. Using ResEdit To Increase the Memory Allocation of the DA Handler

Keep the backup copy of DA Handler around for a few days in case things begin to act strange. If that happens, simply swap the backup for the modified version in your System Folder. If the problem persists, the modification wasn't to blame.

One last thing: this may not be such a hot idea if you have less than 2Mb of RAM.

- ◊ -

To get away from the icon mess: I use Layout (freeware) to change my default display for folders to By Name.

- Displays a lot more information per square inch
- Displays Name plus type ("Word Document..."). This further helps determine a file's contents
- Windows can be made narrower, allowing more windows to remain visible. I use Layout to narrow the default display for that reason.

An extra folder remains open in the lower left corner of the Finder, with only its upper left corner showing so you can see how many K are remaining.

David Swift (CompuServe)

Figure 9–4 illustrates David's tip. Viewing by name provides more information and gives you more information per window inch. Windows viewed By Name (or by any of the Finder's text views) don't tell you how much space is available on the disk. This is solved by creating an empty dummy folder, the "K" Folder, selecting View by Icon for it, then moving the window to the lower left hand corner of your screen so just the number of K remaining shows.
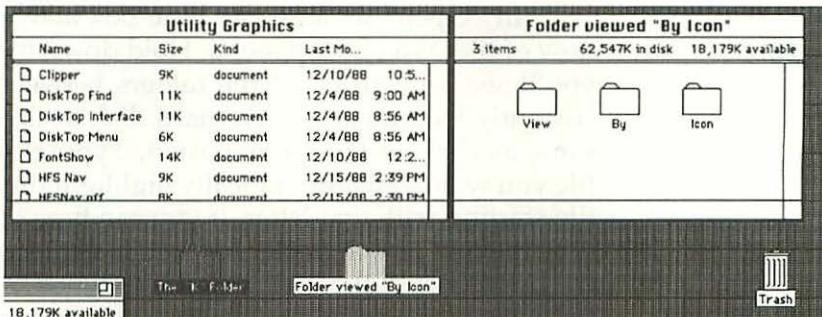
Figure 9–4
View by Name
Allows You To See
More Files in a
Window

**Standard
GetFile
Dialog
Boxes**

I've been a "power user" from the beginning, and I didn't know until recently that, whenever you have to choose a file to open from the standard GetFile, you can use the letter keys to pick the file. (Figure 9–5 shows a standard GetFile dialog. box.)
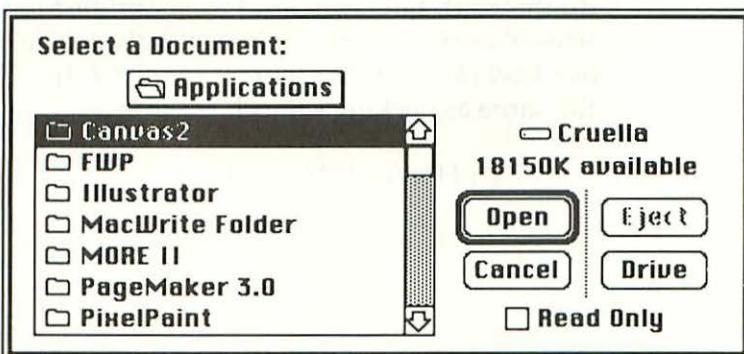
Figure 9–5
A Typical GetFile
Box.

For example, to choose "MACazine letter," you can type an 'm' and the list will scroll to the first 'M' file. If you have more than one 'm' file, type the second and third letter until you get to the one you want. If you wait too long, you will start the selection over. You can use the UpArrow and DownArrow keys to move the selection bar one file at a time. Also, Command-UpArrow and Command-DownArrow move up and down through the folders. You can also move down into a folder by hitting Return with the selector bar on the folder name.

Michael Shulman (CompuServe)

- ◊ -

In "Open" dialogs, the little box above the scrolling window of files is a pop-up menu. Hold down the mouse over it and you'll see a menu of all the folders between the folder you're currently looking at and the hard disk itself. Pressing Tab is the same as clicking the Drive button. Typing the first letter of the file you want will automatically highlight (but not open) the first file starting with that letter. If you can type fast enough, you can type the first few characters of the file name to select it, instead of the first file with the initial letter you typed. As soon as you have typed enough to distinguish your file's name from the rest of the files in the current folder, it will be highlighted. (This also works for folder names.) Pressing Return is the same as clicking the Open button. Clicking on the name of the disk *(Cruella in Figure 9–5.)* will show you the files in the folder that is one step closer to the hard disk (root) than where you currently are. (I wish you could do this with the keyboard.) *(You can! Just press Command-Up Arrow—it works the same as clicking on the name of the disk—it takes you one level closer to the root directory.)* Typing Command-Period is the same as clicking Cancel.

Ken Hadford (MacNet)

- ◊ -

How many people take advantage of the way a standard SFGetFile dialog box responds to keypunches?

- Tab is the same as clicking Drive
- Carriage Return or Enter open the selection
- Command-UpArrow goes backward one volume
- Arrow keys move one file at a time
- Tilde (~) goes to the last entry
- Slash (/) goes to the first entry

There are probably more.

Then there are the Self-Sorting filenames.* All documents are given clear titles. This leaves little room to question a file's contents, and it makes Find File all the more useful.

The first character is often a prefix, especially for word processing documents—I have over 700 of these documents hanging around now. I have adopted the computerish habit of separating title elements by a period. It clarifies the phrasing.

Suggested codes:

- n. for notes
- a. for articles
- l. for letters
- t. and f. for electronic mail—to and from

Using the above, a note from you would be titled:

n.LeVitus.12/20/88.you're fired.

Often-used folders and documents begin with a period so they appear at the top of Standard File lists.

*Contrary to popular opinion, *filename* is not from the English terms *name* and *file*. It is pronounced "feh-LEE-nah-mee" and comes from the Tibetan, meaning "What it is?"

David Swift (CompuServe)

Other
Keyboard
Shortcuts
and Hidden
Secrets

Hold down the Option key after double-clicking on Font/DA Mover, and don't let go until its dialog box comes up. This will make it come up with DAs showing instead of fonts, which is the default. Switching between these options takes a long time without this technique when you have a large System file. Holding down the Option key while clicking the Open button will allow you to put fonts and DAs in specific applications, instead of in the system file.

Ken Hadford (MacNet)

I use these hints all the time. The last part is particularly important; it lets you install a DA directly in an application. Then, that DA isn't in the menu and isn't available except in that specific application.

If you don't use Suitcase II or MasterJuggler or something like them, this is great. If you have a DA or font you use with only one or two applications, you don't need to waste a precious System slot for them. For example, you might install your Thesaurus DA in your word processor. Or a text-editing DA in your telecommunication program. In fact, MicroPhone II comes with a text-editing DA installed in it.

One word of warning: Use backup copies of everything. As with any modification, never work on your originals. On rare occasions this procedure won't work. Even less frequently, it will mess up your font, DA, or application. Keep unmodified backups around until you're comfortable that the modification was a success and everything is working properly.

- ◊ -

How about holding Command-Option-Shift-Delete at startup to prevent the mounting of an internal hard disk? This can be really handy if you need to do something flaky, or want to run "suspicious" software without putting your hard disk at risk

J.L. Doherty (GEnie)

- ◊ -

Provide shortcuts past your menus via the Option, Control, and Command keys (particularly in HyperCard, but in other applications too). Shortcuts are especially useful when you can bypass several menu selections with them. This will make you more productive and happier with the application, and will give you a generally more pleasant outlook on life.

Bruce A. Carter (CompuServe)

- ◊ -

I can't imagine trying to compute without QuicKeys. Being a Microsoft Word user, I never use Command or Command-Shift with QuicKeys. Anywhere. It makes the combinations too hard to remember. I organize mine accordingly:

- Control-key combinations call up DAs (Control-W = Word Finder, Control-F = Find File); function as buttons (Control-Y = Yes, Control-N = No, Control-C = Cancel); and select menu items that don't already have Command keys (such as Control-S = Save As...).
- Control-Shift combinations call applications by name from under the MultiFinder menu—no mousing around. (Control-Shift-W = Word, Control-Shift-R = Red Ryder, Control-Shift-H = HyperCard, etc.) I also use Control-Shift for text strings; Control-Shift-7 types "73270, 302," my CompuServe address.
- Option-Control-Shift combinations launch applications. This beats double-clicking your way through folders in the Finder. The combination is not as hard as it sounds—three fingers kind of fall on the keys once you try it a few times.
- I lay down a fist (that is, use the Option-Command-Shift-Control combination) for keys that will be defined as part of a sequence. (*A sequence is a series of linked QuicKeys, executed in a predefined order by a single keystroke. Each of the steps that makes up the sequence must be assigned a separate key combination; for these, it makes sense to use an obscure key combination.*)

I also use QuicKeys extensively in Word. Word wants the numeric keypad for its own nefarious designs, which bugged me at first. Now I celebrate the decision, especially because some keys are left over and because QuicKeys treats keypad characters as separate from their main keyboard counterparts. Here's what I've built:

- The "*" does a Save, "/" italicizes, and "-" boldfaces—the commands I tend to use most in Word. Heavy formatters could use them for style sheets. A presidential aide could use them for hidden text.
- The Enter key does a single-click on the document; great for deselecting.
- Esc toggles windows (this macro functions as an alias for Word's built-in finger-contorting combo to toggle windows—Command-Option-W).
- Control-Clear zooms windows.

(I've also got lots of sequences that are too painful to try to explain, like auto Word Count, and selection, and button poke.)

By the way, how many ADB keyboard owners know that the Control key is sitting there, ready for QuicKeys to use? You'd be surprised. You should have seen the look on this self-styled techno-weenie I know when I pointed this out. He was building QuicKeys for Quark XPress for a local newspaper, using Shift-Option-Command combinations galore.

Try using Control-key combinations instead of Shift-Option-Command if you have a keyboard with a Control key.

David Swift (CompuServe)

I agree. QuicKeys is superb for customizing any application with Command, Option, and Control key shortcuts. It's one of very few utilities I would never want to do without.

Mouse
Freezes

If you play with buggy software a lot, you'll invariably encounter a frozen mouse at some point. When this happens, everything seems normal except you can't move the mouse. Well, be prepared! Keep a copy of Apple's Easy Access INIT in your System Folder, and use its keyboard equivalents for the mouse when necessary. Press the Shift key five times to turn on Easy Access, then type Command-Shift-Clear to turn the numeric keypad on your Macintosh into a mouse controller. This doesn't always work, but it works often enough for me to keep Easy Access on my Dangerous Software disk.

Neil K. Guy (MacNet)

Backing Up

(This should appear in) large red letters on the first page of the book>>>THOU SHALT BACK UP.

David Ramsey (CompuServe)

- ◊ -

If you back up regularly, you will never have a disk crash. If you don't, you will have a total crash-and-burn the day before that important work is due. This is an immutable Law of Nature. You are not lucky. Anyone who tells you otherwise is a Minion of The Devil.

Richard Reich (CompuServe)

- ◊ -

It is a little-known fact that hard drives are conscious, at least to the extent that they know when you haven't made a backup recently. As soon as they have determined that this is the case, they will crash. And incidentally, if you are contemplating the

purchase of a large (80Mb or larger) hard drive, look into backup options at the same time. Backing up that much data onto 800K floppies can be a drag.

Jeanne DeVoto (CompuServe)

- ◊ -

Backups on the fly: Hard disk users are naive if they don't zap a floppy copy as often a paranoia dictates. The Save As… command is not as convenient as it could be, however; you'll realize how spoiled you've been by your hard disks when you start waiting on floppy writes. (HyperCard's Save a Copy… command should be adopted far and wide.)

Instead of copying from within the application, use Disk-Top. Set it to view files by their time of modification. *(The Finder's View by Date command works just as well, but DiskTop allows you to select and copy the files in one step.)* The last files modified will be at the top of the window for quick grabbing or copying.

Figure 9–6 shows me using DiskTop to do just that—the only file changed today is ResEdit DA Handler. To complete my backup-on-the-fly, I'd copy that file to another disk or volume at the end of my session.

Another way to keep a backup copy handy: Copying a 100K file from one part of a hard disk to another is ridiculously fast—three seconds in my case. Hence, I use SUM's HD Partition (one of the benefits of buying a Jasmine hard disk) to build a 500K "second hard disk" in which I dump backups of modified files
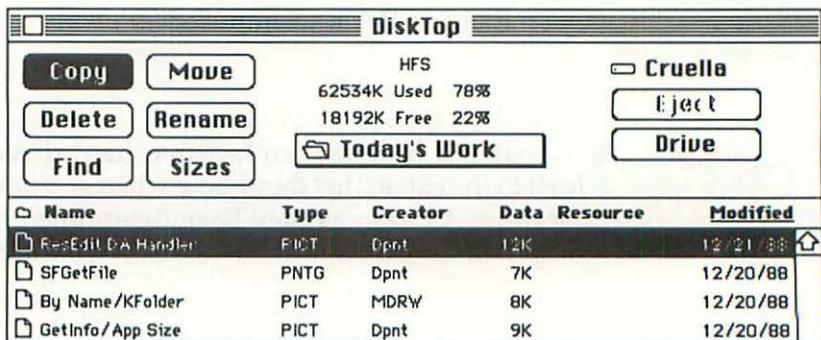
Figure 9–6
DiskTop, Set To
Show Files by Their
Modification
Dates

☐ Name	Type	Creator	Data Resource	Modified
☐ ResEdit DA Handler	FICT	Dpnt	12K	12/21/88
☐ SFGetFile	PNTG	Dpnt	7K	12/20/88
☐ By Name/KFolder	PICT	MDRW	8K	12/20/88
☐ GetInfo/App Size	PICT	Dpnt	9K	12/20/88

DiskTop

Copy   Move   HFS   ☐ Cruella
                62534K Used 78%   Eject
Delete Rename   18192K Free 22%
                ☐ Today's Work   Drive
Find   Sizes

during the session. At the end of the day, when I'm ready to shut down, a Select All (Command-A) of this partition lets me instantly copy final backups onto a floppy.

David Swift (CompuServe)

To make this strategy really pay off, you should save all your work in the same folder during the day. That way you can quickly back up all the modified documents using DiskTop without having to search through numerous folders. If this isn't practical for you, at least try to keep the number of folders with modified files to a minimum.

If your typical work day causes you to work on enough files that this strategy becomes impractical, you should investigate disk backup utilities. There's a complete discussion of them in Chapter 5.

- ◊ -

Back up often, and then experiment. You'll learn a lot and you won't lose anything important.

Lofty Becker (CompuServe)

System Software

Always use the Installer to upgrade your System software. It's important to use the Installer because a System upgrade consists of more than just a couple of new files. Many people have had problems upgrading to Systems 5.0 and 6.0 because they just dragged files, often neglecting to include such things as the MultiFinder file and the Print Monitor file. Then (surprise!) they're perplexed when MultiFinder and background printing don't seem to work. Future System releases may have other files and resources that aren't immediately obvious. Also, just dragging files clobbers any customized resources (fonts, desk accessories, FKEYs, etc.) you may have had in your System. Although early versions of the Installer were buggy, the current versions are very solid and are the best way to upgrade and maintain System software.

David Ramsey (CompuServe)

David Ramsey works for Apple, is a Sysop for CompuServe, and was responsible for MacPaint 2.0. He also wrote numerous articles for MACazine *and is REALLY a power user. He should know: Always use the Installer!*

- ◊ -

Don't keep more than one System file on a volume.

David Ramsey (CompuServe)

- ◊ -

Don't use an INIT or CDEV unless you know exactly what it does and you *really* need it. Eventually you will pay for violating this rule. The more INITs you have in your System Folder, the more unmanageable will be the combinatorics of finding the badly-interacting ones.

Richard Reich (CompuServe)

- ◊ -

Obvious Advice: Unless you've got lots of memory, lots of hard disk space, and lots of patience, don't load your system down with trillions of fonts, INITs, DAs, FKEYs, sounds, and CDEVs. A staggering number of system errors I've seen have been caused by INIT conflicts, lack of memory owing to too many fonts, etc. If you *must* have a lot of fonts, DAs, and FKEYs, use commercial products such as Suitcase II or Font/DA Juggler (a less powerful version of MasterJuggler). These products make life much easier.

Neil K. Guy (MacNet)

- ◊ -

When you keep running out of memory and discover that the System is taking up enormous amounts of space, check the disk cache first. (It's in the Control Panel DA; select the General icon.) That may save you from hours of trying to figure out what kind of virus made the system grow so huge.... Yes, I've had a nasty day working on this one.

Nick Arnett (CompuServe)

Shopping

My first and foremost rule for any novice Macintosh or other computer purchaser is really simple: Don't listen to the salesperson (sorry, guys). Go to a place where they're not paid on commission, and find the owner or manager of the store. If he or she will let you sit down at the computer and take as much time as you want to evaluate it in the store, then that's the place where you should do business—from both a hardware and a software standpoint. This technique gives you a better understanding of whether the dealership is being represented by a bunch of bozos who don't know anything other than the price of the software or hardware, and what the outside of the box says it does, or whether you really have found that gem in the computer world—the dealer who really knows his or her stuff.

Marty Silbernik (CompuServe)

- ◊ -

Don't buy all your software at once. If you are buying a Mac to do five things, start with just the software for one or two of them. As you learn them, you'll be in a better position to pick out the best choices for your other applications.

Scott Harris (CompuServe)

- ◊ -

Find the best dealer you can and cultivate him or her. Buy most things through mail order; it'll save you money. But if you take up a dealer's time getting information about a particular program, buy it from that dealer or not at all.

Lofty Becker (CompuServe)

- ◊ -

Authorized Apple dealers, if they're worthy of the designation, are an excellent source of information. They often have public domain software, which they will give to you if you bring your own disks. If you hear that a new version of the System is out, bring some blank disks to the authorized dealer and you'll get it free (without any documentation, though).

Ken Hadford (MacNet)

Some Apple dealers won't allow you to copy the System software; they insist you buy the shrink-wrapped package with documentation. When a dealer tries this with me, I leave the store and never return.

- ◊ -

When you're shopping for new stuff, magazine reviews are useful, but they should be just one factor in the selection process. Don't assume the author's priorities are the same as your own. Too often I see someone who wants one product over another because of its "5 mice" (MacUser's *highest rating*) or other glowing review. Although it is undoubtedly a good product, it is entirely possible that another program—even one given a poorer rating—may better suit that user's needs. Try to see the program and/or its manual first. By the way, as a dealer, I have to agree with Lofty *(see two notes earlier)*: if a dealer is helpful, gives suggestions, and lets you read the manuals or try out the software, don't buy it elsewhere just to save money! Someone else here said not to trust dealers. Naturally I disagree (and, I hope, so would my customers). But the point of trying to distinguish a knowledgeable dealer from the proverbial used-car salesman is certainly

valid. The fact that buyers will probably pay more at a knowledgeable dealership, and should expect to, might also be worth a mention.

Scott Harris (CompuServe)

- ◊ -

More about reviewers and magazines: The only good review for a business program is from someone who makes their living using some program. And the best recommendations are from those who have made the product—page layout programs, financial programs, spreadsheets, graphics programs, etc.—work for them in the trenches, day to day. Even the best magazine reviews are based on first impressions, even if well-researched and conscientious first impressions.

Also don't be fooled by feature comparisons. Some programs do everything but tie your shoes. But they may not come through day after day as the workhorse that some plainer, less feature-filled program does. I have no problem with features; we all want them. But the more features are imposed on a program and not part of the basic design, the more chance for bugs.

Steve Hannaford (CompuServe)

- ◊ -

Don't be hardware wise/software foolish. People will spend many thousands of dollars on a high-end system, but will balk at buying a program for a couple of hundred if they perceive that it duplicates many functions of some program they have. There *will* be overlap between programs, but it still pays to have the right tool for the job when you need it. One of the nice things about the Mac is that learning, for instance, one graphics program means that it's rather easy to learn a second. Having a variety of graphics programs, desktop publishing programs, or whatever, can save you many hours when you have a project that one program can do easily, but another does only with difficulty.

Scott Harris (CompuServe)

- ◊ -

Buy older versions of software at highly discounted prices and take advantage of publishers' upgrade offers. Many software publishers offer extremely liberal upgrades for little or no cost.

Don Mayer (CompuServe)

- ◊ -

When you're designing a project, take a brief look at what is out there already. Not only will this prevent you from wasting time if the perfect application for your needs already exists, but it may also show up some weak points in your design, new options, and other brain tweakers.

In relation to that, when researching a project, don't become obsessed with collecting every single example of any application even remotely connected to your project idea. You'll spend a lifetime (yours and the project's) reviewing the material, and you'll never actually get around to any development. Actually, this goes for users, too—you can research a purchase to death and never get around to making the buy.

Bruce A. Carter (CompuServe)

- ◊ -

Wet suit companies have been making a ton of money by selling pieces of wet suits to Mac owners to use as mouse pads. Folks, that is not the way to go. Wet suit material actually impedes the movement of your mouse. If you are like most people, your next mouse pad is free. And it will be the best one you ever used.

Find an old vinyl three-ring notebook. You do have one lying around, don't you? Tear off the covers and throw away the spine and rings. You now have two of the best power mouse pads ever made. Your mouse will skate across the surface.

Be sure you use a smooth, hard notebook cover, not the padded variety.

Phil Russell (U.S. SnailMail)

Hardware

Disk drives: If you somehow manage to get a disk stuck in your disk drive, straighten a paper clip and push it straight back through the hole to the right of the disk drive slot. This will force the drive to eject the disk.

Ken Hadford (MacNet)

Be gentle, though; you can damage the drive if you use too much force.

- ◊ -

Don't use slow memory—that is, memory rated at speeds slower than what Apple recommends—in your machine. Look at the part numbers on the memory chips. They'll generally end in "-12" or "-15"; in some cases they'll end in "-10." These numbers represent the "speed" of the chip in nanoseconds (ns): the "-15" parts are 150-nanosecond parts; the "-12" and "-10" are 120- and 100-nanosecond parts, respectively. The smaller the number, the faster the memory chip. Mac Plus and SE computers can use 150ns parts, although most are shipped with 120ns parts these days. Mac IIs must use 120ns parts. Note that the Mac II (*IIx, SE/30, and IIcx, too*) requires faster memory because it runs at twice the clock speed of the other machines—16mHz as compared to 8mHz (memory speed doesn't follow clock speed directly for various reasons). Although 150ns parts are often better than their specification and may seem to run correctly in a Mac II, using them is asking for trouble. As the memory starts to fail at the higher speeds, flaky, obscure errors and crashes will result. Installing faster memory—say, 100ns parts in a Mac II—will not make the machine any faster and is only wasting money.

David Ramsey (CompuServe)

- ◊ -

Don't buy an Apple SE/20.

Most hard drive manufacturers make rear mounts for their drives that will allow you to keep both floppy drives on the SE and have a larger-capacity hard drive (and change back for your dollar).

Don Mayer (CompuServe)

- ◊ -

When all else fails, try the following sovereign sequence (known to power users everywhere):

1. Rebuild Desktop
2. Replace System
3. Zap PRAM
4. Curse Microsoft.

Jeanne DeVoto (CompuServe)

- ◊ -

Always use "Shut down" to turn off a Mac II, and use it prior to turning off a Plus /SE.

David Ramsey (CompuServe)

Software

Don't use copy-protected software. It's not worth the fuss and bother. If you must use a copy-protected package, don't install it on your hard drive—some copy-protection schemes provide a way to do this, but these techniques may alter formatting or do other things to the hard drive that can cause major problems, up to and including loss of all your data.

Jeanne DeVoto (CompuServe)

- ◊ -

Using a spreadsheet: When you have several "areas" that you are putting on a spreadsheet, don't put them side by side or on top of each other; rather, put them in a diagonal line starting in the upper left-hand corner and go to the lower right-hand corner. *Reason:* if you have the sections side by side or on top of each other and insert or delete a column or a row, your action affects all the sections. If you have the sections in a diagonal row, inserting or deleting a column or a row will have no effect on the other sections because none of them fall into the same rows or columns at any point in the spreadsheet. *Hint:* to find your way from section to section using this technique, just name each section with its own name and make a macro that "goes to" that section.

Dave Duty (MacNet)

- ◊ -

Charts created in Microsoft Excel and Microsoft Chart may be copied to the clipboard and then pasted into a MacDraw or MacDraft document. Some shading may be lost, but each piece of the chart (each bar or line segment and each text item) turns into a separate MacDraw object. This allows you to dress up the chart to your heart's content. For example, this is very handy for putting more than one chart on a single piece of paper.

Phil Reed (CompuServe)

- ◊ -

Microsoft Word has its own Page Setup and Print dialogs. To get the usual ones, simply hold down the Shift key while selecting the item with the mouse.

Ken Hadford (MacNet)

- ◊ -

If you're trying to copy music into a sequencer from Electronic Arts' Deluxe Music Construction Set, via MIDI, use the modem port, *not* the printer port. Although the printer port will

work properly with most MIDI equipment, it seems to send incorrect timing signals. Thus, the receiving sequencer (or other device using external timing signals) will get the notes, but it will squeeze far too many of them into each bar of music.

Nick Arnett (CompuServe)

- ◊ -

In all versions of Aldus PageMaker for the Mac, the program doesn't really delete anything, because it operates as a database does (it just flags the records as deleted). Therefore, to conserve disk space or to make a file as compact as possible before sending by modem, you should use the Save As command, rather than Save. You don't have to give it a new name.

Save As compresses the file by actually deleting anything you've removed from your document. This is documented in the manual's description of the Save As command, but we experienced Mac users figure we know what Save As does, so we don't read that section of the manual. I suggested to Aldus that in future versions they include a "Compress" command. The product manager replied, "Great idea. Nobody here thought of that."

Nick Arnett (CompuServe)

This is particularly true of PageMaker files, but sometimes works on files created by other programs. You may be able to save hundreds of K on a large document by selecting Save As after making final changes. So remember: if you're trying to conserve disk space, use Save As when you're finished with each document. You'll be surprised how much disk space you can save.

If you have a more severe need to save disk space, you should check out StuffIt, the shareware file archive utility. It can compress files as much as 40 percent. There's also a convenient DA version called UnStuffIt that can be used to extract files from an archive even when you're working in another application.

- ◊ -

When computerizing (is that a word?) one's financial system, continue on a parallel manual system until such time as the automated one has proven itself—a matter of months or even a year. My biggest heartache in England was having people's accounting systems crash on their Apple IIs, simply because the software couldn't handle the quantity of data. We would then discover their manual system to be hopelessly out of date. This probably holds true of most operations, not just financing.

Richard Scorer (CompuServe)

- ◊ -

Try to put aside enough time to learn about the software you use; don't just use it.

Richard Scorer (CompuServe)

- ◊ -

Most new users learn enough of the basic operations of a given program to "just get by" and then don't want to go through the effort of learning additional features. I don't know how many times I've heard: "I don't have the time. I just want to do it the way I've always done it." This "cop-out" attitude guarantees that you will never be a power user. Don't settle for the status quo. Even under a deadline, be adventurous. The best way to learn software is to use it on a real project and refer to the manual when you get stuck on a specific feature. Yes, this will slow you down in the short term. However, the time you seem to be wasting now with the learning process will be made up in the long run, because you will be able to select the best and fastest way to get future projects done based on your early efforts. I call this "reaching for critical mass." Each program mastered in this way makes the next one easier to learn.

John A. Noel (CompuServe)

- ◊ -

Send in your warranty/registration cards! You'll get notified about upgrades (most of the time), and you'll be helping the publisher compile some really seriously unwieldy databases....

Robin DeVoe/Microseeds (CompuServe)

Microseeds publishes the highly recommended backup utility Redux.

Printing/Typesetting

Get a copy of the LaserWriter printer driver and put it in the System Folder. Before starting *any* job that will ultimately be printed on the LaserWriter, select the Chooser DA, and select the LaserWriter printer. This will work even if you are not currently hooked to a network with a LaserWriter. Then choose Page Setup in whatever application you will be using to make sure the page size is correct. In many applications, the page width for the ImageWriter is 8.0 inches, and the width for the LaserWriter is 7.5 inches. Failure to select the LaserWriter before starting may result in the rightmost one-half inch of the document being chopped off, or possibly placed on a second page.

Bruce Giles (CompuServe)

- ◊ -

Get copies of the screen fonts for the LaserWriter fonts and use them. Understand the difference between bitmapped fonts for the ImageWriter and PostScript fonts for the LaserWriter. Know when to use each type of font (and when *not* to use them as well). Understand the effect of the "Font Substitution" and "Smoothing" check boxes in the "Page Setup" dialog box.

Bruce Giles (CompuServe)

- ◊ -

If this is your first time working with a LaserWriter, start with a simple one-page document and make sure it works correctly before trying something more complex.

It's easy to spot the people who haven't learned these rules. They're the ones who spend all night (not to mention many dollars) trying to figure out why their 20-page MacDraw document in Toronto and Chicago fonts, which printed just fine at home on the ImageWriter, has turned into a 30+-page monstrosity with page breaks in the wrong places, and why it still looks like it was printed on an ImageWriter.

Bruce Giles (CompuServe)

- ◊ -

Many Mac II programs won't print in color on the ImageWriter or ImageWriter LQ, because the drivers of these printers use "old QuickDraw" (8 colors) rather than color QuickDraw. However, if you can get these files into GIF format (using GIFFER or one of several programs that understand GIF), you can use the GIFConverter program over in the PICS forum *(GO PICS on CompuServe)* to bring the 256-color GIF file into old QuickDraw format. You can then print in color on an ImageWriter. Looks pretty good, too (although it takes forever).

Jeanne DeVoto (CompuServe)

- ◊ -

Previewing laser files: If you're using somebody else's LaserWriter printer, you'll have a lot of trouble previewing the documents properly on an ImageWriter printer. This is partly because the LaserWriter can't print as close to the paper edges as the ImageWriter can and partly because the printers use different printing software (QuickDraw versus PostScript). However, you can trick a Mac into using the LaserWriter Page Setup... dialog box by installing the LaserWriter drivers in your System Folder, and selecting them from the Chooser. Because AppleTalk must be turned on, be sure not to have an ImageWriter or something plugged into the printer port, as otherwise you'll be greeted by a

large pile of spurious characters. Do a Page Setup as normal and you'll then be able to preview the document on the screen. Be sure to turn off AppleTalk before reselecting a printer other than the LaserWriter.

Neil K. Guy (MacNet)

- ◊ -

Quotation Marks: One of the sure giveaways that something was printed on the Macintosh rather than being professionally typeset is the lack of true quotation marks. Real quotation marks, known as curly quotes, curved quotes, true quotation marks, printers' quotation marks, and smart quotes, curve around the text (" and ") as do real apostrophes (' and '). Generally, type-writers and ordinary computers can only do neutral quotation marks and apostrophes (" and ') that don't curve and thus look rather ugly. The Macintosh is, of course, quite capable of doing true quotation marks, but it's not completely obvious how. If you pull down the KeyCaps DA from the Apple menu you'll see that proper quotation marks are typed in with Option-[and Shift-Option-[, whereas apostrophes are created with Option-] and Shift-Option-]. Once you get the hang of it, this isn't too difficult, but it is a bit of a nuisance. Fortunately there are ways of generating proper quotation marks automatically. One method is to purchase a commercial program, such as LaserAuthor or FullWrite Professional, that has so-called smart quotes built in. Alternatively you could pick up shareware utilities that do the same thing for whatever you type. The Smart Quotes desk accessory is one such utility, as is the terrific INIT Quote INIT. The latter is probably the best, as it's a self-installing INIT file that takes up a minuscule 1K on disk and that can be turned on or off. The last feature is very useful as some programming languages (4th Dimension's procedural language, for instance) need neutral quotation marks, ugly as they may be.

Neil K. Guy (MacNet)

- ◊ -

Italicizing: Before the advent of the typewriter, all text that was to be emphasized was *italicized*, but most typewriters can't do this. As a result, the practice of <u>underlining</u> came into practice, as it is something that primitive typewriters can handle. With the Macintosh, however, it is no longer necessary to underline anything, as very nice italic features are built into the machine. Underlining is also stunningly ugly, whereas italics are much more elegant, so give italics a try next time—especially on the Laser-Writer.

Neil K. Guy (MacNet)

- ◊ -

Ligatures: In many typefaces, particularly those with serifs (the small horizontal and vertical lines at the end of a letter), the letters "f" and "i," when written in lower case, look rather silly side by side. This is because the upper loop of the "f" and the dot of the "i" tend to overlap. Fortunately, most Macintosh laser fonts have built into them nice "fi" ligatures in which the "i" has no dot and the "f" has a more prominent loop. Type Option-Shift-5 to get this. There is also the "fl" ligature, available (in most fonts) as Option-Shift-6. It's often easiest to type normally, and then do a case-sensitive search-and-replace operation (you don't want to replace FI and Fi). Those aren't the only ligatures in the laser fonts. If you're typing in French or other languages, the "o-e" ligature (as in "œuf") is produced by typing Option-q. The "a-e" ligature, suitable for English spellings of words such as "æsthetic" is made by typing Option-apostrophe. These two ligatures also have upper-case equivalents, brought about by holding down the Shift key.

Neil K. Guy (MacNet)

Ligatures are combinations of two characters—œ, æ, fl, fi, etc., as shown in Figure 9–7.

- ◊ -

Hyphens: Another artifact left over from the days of typewriters is the practice of using two hyphens (--) to represent a
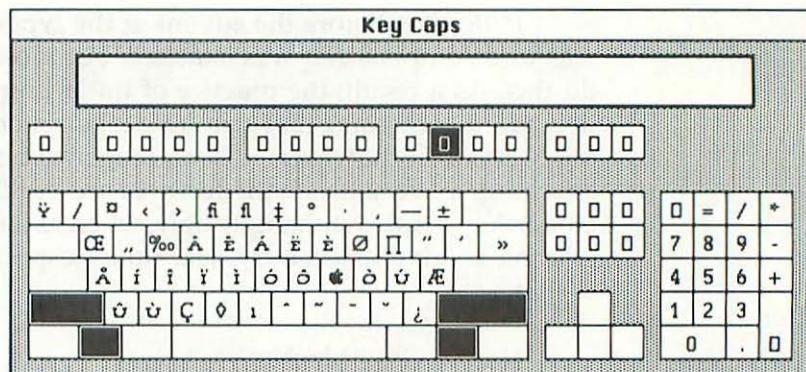
Figure 9-7
Finding Ligatures
with the Key Caps
DA by Holding
Down the Option
and Shift Keys

long dash (em-dash). The Mac can help you excise this horrible custom from your work, as well. Typing Shift-Option-hyphen gives you an em dash, which is the same width as the letter M in the font you're using. These longer dashes are best used to separate an additional idea from a sentence—as shown here. The Mac also has en dashes, hyphens the width of the letter N in the font you're using; these are created by typing Option-hyphen. En dashes are used to separate numbers (pp. 25–32, or 512–258–1127, for example).

Neil K. Guy (MacNet)

- ◊ -

Fonts in general: These last few tips have focused on specific features available in most fonts. You shouldn't forget, however, that any North American Macintosh can type in English, French, German, Spanish, Italian, Swedish, Norwegian, Danish, Portuguese, and other languages without any modification! You can also produce a myriad of special characters, from currency symbols such as the British pound sterling (£) and the Japanese yen (¥) to embellishments such as bullets (•) and diamonds (◊). Experiment with the Key Caps desk accessory and your user manual for more details.

Neil K. Guy (MacNet)

Potpourri

Everyone knows that you can cut and paste within an application, and most people should know that you can cut and paste between standard applications as well. However, many people forget that you can also cut and paste between desk accessories and applications. So, if you need the current time in your text document and the program you're using doesn't have the ability to do this, just pull down the Alarm Clock DA and copy the time from there. If you want to calculate a complex equation, type it in first into a text document (or the Note Pad DA) and then paste it into the Calculator DA. The buttons will flash merrily away and you'll have your answer, which can then be pasted back into whatever you were working on.

Neil K. Guy (MacNet)

- ◊ -

Remember the Clipboard! In these days of programs that import and export zillions of file formats, it's easy to forget that there is a simple way to transfer graphics and text between applications. I can't count the number of people who have called trying to transfer graphics between, say, ImageStudio and PixelPaint, distraught because they were unable to find a common file format. I ask them, "Have you tried copying and pasting?" It works.

Jeanne DeVoto (CompuServe)

- ◊ -

The Clipboard and the Scrapbook really do work! Yes, you can copy a graphic or text item from program A onto the Clipboard, quit program A, run program B, and paste the contents of the Clipboard into program B. It drives me up the wall to see a Mac user at the photocopier with rubber cement and scissors doing graphics and text integration the old-fashioned way. No matter how hard I push this at work, there are always users who cannot

make the leap in faith it takes to try it out or who think it is too much trouble. Make yourself use this feature. It is at the crux of what the Macintosh user interface is all about, and it works.

John A. Noel (CompuServe)

- ◊ -

If you do a lot of work with ordinary text files and you find yourself messing around translating documents into different formats using large applications such as MacWrite, WriteNow, Microsoft Word, etc., then take another look at Apple's Teach-Text utility. It's a small and handy, if simple, text editor. And while you're using it, try pulling down "About TeachText..." from the Apple menu with the Option key held down.

Neil K. Guy (MacNet)

- ◊ -

I save a lot of things in Text format; text files take up a great deal less disk space than their counterparts stored in a formatted word processor file. For example, after I've printed a letter and it's been sent, I save the letter as text only.

- ◊ -

The most important power hint I can recommend for users is to be organized. In my company we have several new Mac users, and their hard disks are a mess. They don't know how to organize their files and their information in a logical manner. I recommend organizing all of the files on a hard disk in this way. Name the folders: System Folder, Applications, Private (or Personal) files, and Utilities. Keep only System files and related IN-ITS and CDEVS in the System Folder. Break down the Applications folders with individual folders for programs such as MacWrite, Microsoft Word, PageMaker, MacTerminal, etc. Break down the Utilities folder into folders for Fonts and DAs, copy applications (for programs such as Copy II Mac), INITs and CDEVs (in which you can store extra INITs and CDEVs that are useful but not always needed).

This is just an example. The main point I am trying to make is that without some form of organization, users will end up with multiple copies of files and not know where to find things. Without this benefit, all other power hints are useless. I hope this helps.

Jeffrey Dumm (MacNet)

The Control Panel's icons are from the corresponding files (called "CDEVs") found in your System folder. You can remove from the Control Panel CDEV's you don't want (such as "Startup Device" when you have fewer than two hard disks) simply by taking them out of the System Folder.

Ken Hadford (MacNet)

It's probably not worth removing CDEVs if you aren't tight on disk space. The Startup Device CDEV, for example, takes up only 3K of disk space.

- ◊ -

I violate this advice all the time—but maybe you'll be smarter: Never be the FIRST. Wait two weeks before installing anything new, zippy, and red-hot. Let someone else find the killer bugs.

Richard Reich (CompuServe)

- ◊ -

You can have a half dozen of your most frequently used DAs appear at the top of the Apple menu. Using ResEdit, open the DA, then open its DRVR resource. Select the only line in the DRVR window. Get Info on it (Command-I). Now add a space before the name of the DA. Two spaces will place it higher on the list than one space, and so on. *(See Figure 9–8 on the next page.)*

Phil Russell (U.S. SnailMail)
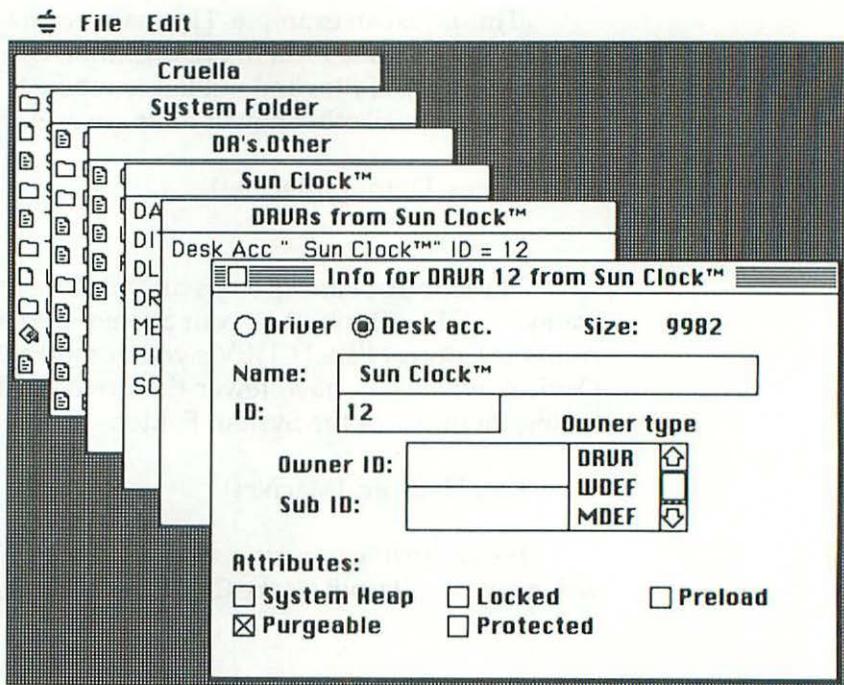
Figure 9–8a
Using ResEdit To
Make Sun Clock
DA Appear at the
Top of the Apple
Menu

Figure 9–8b
The Result of
Placing a Space
Before the Name
of Sun Clock with
ResEdit

In Figure 9–8a you can see that I've added two spaces to the beginning of the Name field. Instead of "Sun Clock™" it's now named " Sun Clock™" (note the space before the "S").

In Figure 9–8b, you can see the result of the changes I made in Figure 9–8a. Sun Clock, instead of appearing in its usual place way down at the bottom of the Apple menu, appears at the top of the list after the space has been added to the beginning of its name with ResEdit. (Note: MasterJuggler is designed so that its name is always first on the list, regardless of what you rename other DAs.)

- ◊ -

If you want to get work done, don't buy version 1.0 of anything.

Lofty Becker (CompuServe)

- ◊ -

Someone asked me the other day how to print a list of all of the files in a folder. All I could think of was to open the window, do a screen dump, scroll the window, do another screen dump, etc. Then she asked me: "What does this Print Directory option in the file menu of the Finder do?" *(It does exactly what she wanted.)* So my advice is: be sure to read all of the choices on the menus before accepting that it can't be done.

Michael Shulman (CompuServe)

- ◊ -

Better to learn four programs well than forty badly.

Lofty Becker (CompuServe)

- ◊ -

As soon as you buy the computer, buy a modem and a CompuServe subscription kit. This group (MAUG) is a group that no Apple user should be without. If you have a question or problem, this should be your first and foremost resource for technical support. If you don't get the answer to your question or problem from the author here, you'll get at least two or three responses from people who know that piece of software or hardware intimately. I have learned more about my Mac by following these two rules than anything else.

Marty Silbernik (CompuServe)

- ◊ -

Electronic Bulletin Boards and Conferences: If you buy a modem, you are instantly connected to an excellent supply of public domain and shareware software, as well as excellent advice relating to your questions. Most bulletin boards (BBSs) are free, but you can also use a modem to connect to pay services such as MacNet, GEnie, and CompuServe. Even if there are no Macintosh BBSs in your area, there is likely to be one running on an MS-DOS computer with the Opus BBS software. If you are nice enough to the person operating the BBS, you might convince him to pick up the EchoMac conference. This instantly links you with other Mac users all over the world. If you live near a respectable university or college, check with the people there; they may be connected to an educational network, such as UseNet or BitNet. If you can arrange an account, this is another way to communicate with Mac users around the world. UseNet has News, a worldwide conferencing system, with a Mac area called "comp.sys.mac" and subareas called "comp.sys.mac.programmer" and "comp.sys.mac.hypercard." BitNet isn't quite as nice, carrying only "INFO-MAC," a digest of discussions from UseNet and other electronic services. There could be a Mac-specific area on BitNet, but if there is, the University of Calgary doesn't receive it.

Ken Hadford (MacNet)

- ◊ -

The computer doesn't tell you when there isn't room on the disk for a screen dump (Command-Shift-3); it just doesn't do anything. So if your screen dumps don't seem to work, check for room on the disk *(screen dumps take 10–20K)*. If there's plenty of room on the hard disk, the Mac may be trying to write to a nearly full floppy, so put your application on the hard disk and try again. I can't tell you how many times I've forgotten this and wondered why a screen dump wouldn't work.

Nick Arnett (CompuServe)

- ◊ -

To help new users, I start pointing out things that work in common among various programs, and I show them how some operations (like selecting areas) work similarly across applications. A really important similarity is the behavior of windows—stacking, shrinking etc. Some people are really amazed at the way their use of the Mac changes when, for example, instead of opening and closing the Scrapbook each time they need a picture, they align Scrapbook and application windows so that they can just click to activate the window they need.

Allen Wessels (CompuServe)

- ◊ -

If you use shareware software (or any of the various variations thereof) SEND IN YOUR SHAREWARE FEES! You might think that your one little holdout won't hurt anything, but when several hundred or even thousand people are thinking the same thing, the result is that the poor (literally and figuratively) shareware author thinks nobody likes the software, gets depressed, goes broke, gives up computers, becomes a hermit, and never writes another program for the rest of his pathetic isolated thoroughly depressed life. Well, maybe that's overstating it a bit, but you get the idea....

Bruce A. Carter (CompuServe)

I couldn't agree more. There are a lot of useful shareware programs floating around. Authors like Ray Lau (StuffIt) and Lofty Becker (DateKey, TimeLogger) should be rewarded for their work. If you don't pay for what you use, eventually nobody will bother to write shareware anymore. Shareware only works if we all make it work. If you use it, you really should pay for it. End of sermon.

- ◊ -

You can get some extraordinary software at great prices as shareware and public domain software. This kind of software is available almost everywhere that has a Mac-oriented area, as well

as by the disk through companies such as BudgetBytes. Shareware is try-before-you-buy. You are given a time period to try the software, after which you must decide to either delete it or pay for it. There is a lot of mediocre-to-awful stuff to wade through before you stumble upon a gem, though. Some excellent software I've found:

StuffIt! by Raymond Lau—compresses the information in files so that it takes up less disk space. Once compressed, the files have to be decompressed before they can be used. An excellent program, the best of its class on the Mac. (It's shareware that even Doug Clapp recommends!)

JoliWrite by Benoît Wildemann—a superb text-editing DA.

Risk by Anatone Engel—FREE! One of the best games I've ever played, anywhere. This is great.

Talking Moose (CDEV version) by Steve Halls. You haven't used a Mac until the Moose has told you "You are getting sleeeeepy.... Your eyelids are getting heavier and heavier...."

Ken Hadford (MacNet)

- ◊ -

Don't use bootleg software. It's unfair both to you (you're not getting the full power of the package because you don't have decent documentation) and to the people involved in the production of the material (they aren't getting the money). And, it promotes a generally bad attitude that will probably contribute to the downfall of life as we know it.

Bruce A. Carter (CompuServe)

- ◊ -

People with IBM-compatible computers hack at them with "debug," a utility that comes with their computers. Mac users do it much more elegantly with ResEdit. (Check to see if your Authorized Apple dealer can give it to you—it's free. It's also available on CompuServe, MacNet, and GEnie.) You know you're a Mac "power user" when you harness the power of ResEdit. ResEdit

and a copy of *Inside Macintosh* (volume 1) will teach you a great deal about how your Mac works. Feel free to poke around in COPIES of all your Mac software ...just as long as you have the original locked up somewhere in case something goes wrong.

Ken Hadford (MacNet)

- ◊ -

Don't be afraid to ask more advanced users for help. Generally they don't bite (well, not very hard anyway), and they are usually flattered and happy to help. I wouldn't recommend calling Danny Goodman at home, but asking on forums like this certainly will provide you with plenty of input (more, no doubt, than you ever expected—or even wanted).

Bruce A. Carter (CompuServe)

Hidden here near the end of the chapter is perhaps the most useful advice of all—a modem connects you to a world of friendly, helpful Macintosh users. There's nothing like the Macintosh community online .

- ◊ -

When you have a problem with your machine, hardware, software, or whatever, document the problem completely. This means everything. Version numbers of all of your applications that are having problems, System versions, etc. Write down names and revisions of *all* of the CDEV, INITs, and other possibly screwy things.

Write down any ID numbers associated with the bombs, sad Macs, crashes, etc. This means *all* the numbers, in the order in which they appear on the screen.

Describe the problem in more detail than "the screens are all messed up." If the screen is a checkerboard, how many "checkers" are on the screen horizontally and vertically? Before you send an EMail to Dave Ramsey about the line on your color monitor, look at the threads up here on CompuServe.

Are you running under MultiFinder, Switcher, or God forbid, Servant? Try turning it off and see if that fixes the problem. If you are running any extra hardware such as accelerators or large screens, disable them if possible to see if the problem goes away. If that doesn't work, and you are technically competent, remove them.

Try running from a floppy with a virgin system if possible. By *virgin* I mean as few generations from Apple as possible without modification. Barring that, try removing CDEVs and INITs one or several at a time until you are as close to virgin as possible. This also means that you should keep an unmodified system disk at all times. *Never* use it except for making copies. Don't even put it in a suspect machine.

Write down how long the machine was running before the crash. Does it crash every 5 minutes or once a week? Was it in an exceptionally hot or cold room? If it crashes when you first turn it on, let it warm up a while (as long as there is no smoke or anything like that), and see if it still crashes.

If it crashes on a power up, let it crash and then try the reset switch.

If a hard drive crashes when trying to boot, try booting from a floppy with a copy of the system on it.

Then call for technical support. You can save immense amounts of time and many headaches for yourself and the nice people in technical support by doing this. After you have an RMA *(Returned Merchandise Authorization)* number for something to send in, send a copy of *all* of this documentation with the product, because the people that will repair it won't have gotten anything from technical support except that "It's messed up." And don't forget a return address! It's amazing how many boxes we've gotten over the years with nothing but a board in them.

Doug Gilbert (CompuServe)

Doug should know; he works for Levco, which manufactures a complete line of high-quality performance hardware products for the Mac. If you follow his advice, chances are your experience with technical support will be a positive one.

- ◊ -

Say something nice to hot-line and user-support people once in a while. It brightens their day and it's no skin off your nose. Besides, they might remember you and buy you a drink at a conference someday (this should give you an indication of how few people follow this tip).

Bruce A. Carter (CompuServe)

The Last Resort of Power Users Everywhere: RTM

Known by the acronym "RTM," this tip entails quite a bit more work than any others mentioned above. Maybe that's why it's so radical (and why I saved it for last). It is: *Read the manual!* Doug Clapp has already said it, but it hasn't been heard enough; many of the "tips" you hear about are actually in the manual that came with the software. A surefire way to amaze your friends and pets.

Ken Hadford (MacNet)

While you're reading through the manual, be sure to study the Command-key shortcuts. You'll be surprised how much time you save when you access menu choices from the keyboard. Get into the habit of using keyboard shortcuts.

- ◊ -

RTM before you call technical support. We're glad to help someone who's having a problem (it's our job), but it does get a little wearing to literally read the manual out loud to someone who can't be bothered to look up the installation procedure, or whatever....

Jeanne DeVoto (CompuServe)

As an absolute last resort, look it up in the manual. Trees died for that document.

Bruce A. Carter (CompuServe)

Recommendations

The products recommended for the first time in this chapter are listed below.

UnStuffit

A StuffIt archive decryptor. Chapter 8 contains a description of StuffIt.

Giffer

Giffer is an application which can open documents of various types (PICT, SCAN, StartupScreen, etc.) and save them in the GIF format. GIF is a universal file format that allows documents with up to 256 colors to be viewed on computers other than the Mac.

SmartQuotes and Quote INIT

SmartQuotes and Quote INIT are shareware products for automatically inserting the correct typographer's quote (", ", ', and ') whenever you type the typewriter equivalent (" and ').

KeyCaps

Part of Apple System Software, KeyCaps is useful for finding hidden characters. Select the font you're using in your document from the KeyCaps menu, then press Option or Option Shift.

TeachText

Simple text editor/reader. TeachText is licensed to software developers at a favorable rate to encourage them to distribute it with their products. This is (usually) the program that opens when you double-click a Read Me file.

Vantage

My favorite text-editing DA. Vantage is an excellent, fully powered text-editor-in-a-DA with many exclusive features:

- Allows you to have up to 16 windows open at a time
- Reorganizes and/or sorts sentences, paragraphs, and columns
- Adds or removes linefeeds
- Works in full color on machines so equipped
- Has a built-in macro function
- Has a built-in spelling checker
- Counts characters, words, sentences, lines, and paragraphs

It's expensive, about $100, but if you manage many text documents, you'll love it.

It's also well suited to cleaning up text that has been captured on-line. In Figure 9–9 you can get an idea of the power this DA offers. The Format and Convert menus provide functions that aren't available in many higher-powered word processing applications.

A shareware version with far fewer features, called McSink, is also available.

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| ⇦ File Edit Layout **Format** **Convert** Other M⇨⇧ |

Format		Convert	
Form Paragraphs	⌘J	**Upper Case**	⌘U
Word Wrap to Length	⌘M	**Lower Case**	⌘L
Word Wrap to Window	⌘W	**Change Case**	
Flush Right to Length		**Capitalize Sentences**	
Indent	⌘]	**Capitalize Words**	
Unindent	⌘[		
		Tabs to Spaces	
Sort Lines		**Spaces to Tabs**	⌘T
Reverse Order Lines		**Space Runs to One Tab**	
Sort Parameters...			
		Strings	▶
Columnize Row Order		**Line Numbers**	▶
Columnize Column Order			
Columnize Parameters...		**Strip Controls**	
		Strip Trailing Space	
Insert Page Break	⌘7	**Add Linefeeds**	
		Strip Linefeeds	

Figure 9–9
Vantage is a Text-editing DA with Many Advanced Features

MiniWriter

An excellent shareware text editor for those on a budget. It has features not found in most word processors—it will give you a count of characters, words, and paragraphs for any selection.

JoliWrite

JoliWrite is another nice shareware text editing DA.

Risk

Freeware game.

Talking Moose CDEV

Perhaps the most enjoyable shareware program yet. A moose comes on your screen and speaks to you at intervals you define. It includes a moose phrase editor, and many extras. The author is looking for a commercial publisher, and it may not be available as shareware in the future.

The Dr. Macintosh Dictionary

accelerator card A type of card that contains a processor that shares computing tasks with the CPU of your Mac. It speeds up processing.

active window The frontmost, currently selected window. Only one window is active at any time. The active window's title bar is always highlighted.

ADB (Apple Desktop Bus) A low-speed input bus for input devices introduced with the SE and II. The ADB's main advantage is that you can daisy-chain up to 16 devices (mice, keyboards, trackballs, graphics tablets, etc.) on the bus. Mac Pluses and earlier Macs have separate mouse and keyboard ports, which means that keyboards and mice from earlier Macs don't work on the SE or II and vice-versa.

alert box The little message boxes that appear when your Mac has something to tell you. Examples include these always–popular messages: "An application can't be found for this document" and "Please insert the disk 'diskname.'" These messages are usually accompanied by a beep.

Apple Menu The menu from which you select desk accessories. It's the leftmost menu, called the *Apple menu* because it's represented in the menu bar by an Apple icon. Some games don't support desk accessories or the Apple menu.

AppleShare Apple's file-serving software. Requires a Macintosh Plus or higher as a dedicated server (that is, a machine that isn't used for anything else).

AppleTalk The network protocol built into every Mac. Allows Macs to communicate easily with other Macs and with AppleTalk-equipped printers (that is, many laser printers).

In the past, AppleTalk also referred to the cables and connectors used for connecting Macs, but the name of the hardware has since been changed to LocalTalk.

application Software that is used to accomplish tasks that would be necessary even if you had no computer: word processing, database manipulation, etc. Applications are used to create files; they are the tools you use to accomplish most tasks on your Mac. Often called *programs*. Examples are MacWrite and MacPaint.

archive (archival backup) Copy of files stored in a safe place.

ASCII (American Standard Code for Information Interchange)
A standard for assigning binary definitions to letters and numbers. Almost all computers can understand an ASCII file. On a Macintosh, ASCII files are usually saved as "text" or "text only."

A/UX (Apple/UNIX) The Apple version of the UNIX Operating System. UNIX is a multi-user, multitasking operating system developed by Bell Labs in the mid 1970s. It is popular among college networks, scientific laboratories, and the government for its sophisticated abilities in dealing with multiple users and tasks.

Available only for Mac II and later models.

background A phrase used to describe where a program is running (that is, actually doing something) under MultiFinder when you are working in a different program.

Most telecommunication programs (Red Ryder, MicroPhone II, SmartCom II) run "in the background." This means that they can log on to a remote computer via modem and upload or download information while you process words or crunch numbers in another program.

Some database and spreadsheet programs perform calculations, sorting, and searching in the background.

background printing (spooling) The ability to send a file to the printer while continuing your work. Printing in the background is often called print-spooling.

Without spooling, you usually have to wait several minutes while the file is being processed after you click the OK button in a print dialog. A spooler that allows background printing lets you get back to work in a lot less time. If you use MultiFinder, a spooler is built in. If you don't use MultiFinder, there are several commercial products available.

backup (back up) A copy of a file, files, or the entire contents of a disk. Computers and hard disks break. A backup insures you're never left without copies of important files. Don't Shut Down without a backup!

baud Baud rate measures how fast your modem works. Higher means faster, but doubling baud rates doesn't double throughput. The speed of communication between any two modems cannot be faster than the slower of the pair. For example, if you have a 19,200-baud modem and your friend has a 2,400-baud modem, you'll communicate at 2,400 baud.

Baud describes the number of discrete signal events per second occurring on a communications channel. Though it is technically incorrect, *baud* is often used to refer to bits per second (bps). (Bps isn't the same as discrete signal events per second.)

BBS (Bulletin Board System; sometimes referred to as RBBS— Remote Bulletin Board System) An electronic communications center where users with modems can exchange notes and programs. You connect with a BBS by instructing your modem to dial its phone number. Some BBSs require payment before access is granted; others are free.

binary A numbering system that uses the powers of 2. Computers use the binary system, which allows the use of only the numerals 1 and 0.

bit The smallest chunk of digital information, equal to a yes or no and represented by the numerals 0 or 1 in binary. All files are made up of bits. Lots of them.

bitmap (Also: bit map, BitMap, bit-map) Graphic format used by paint programs. Images consist of dots (pixels) on the screen. Most bitmapped graphics have a resolution of 72 dots per inch.

bomb The icon in the dialog box you see when your System crashes. Also used to refer to the crash itself: "I was working on my resumé when my Mac bombed."

boot (booting, boot up, booting up) In the old days, starting up a computer required you to toggle a number of switches on the front panel, which began an internal process that loaded the operating system. The process became known as *bootstrapping* (later

shortened to *booting*), as a reference to "pulling yourself up by the bootstraps," which is what the computer would do when the right switches were toggled.

Today, *boot* refers to the process of starting up your computer. Some people also use it to indicate starting up an application: "So I booted up Excel and...."

BPS (bits per second)
See: baud

bug In the old days, insects (yes, real bugs!) would fly into the guts of huge, refrigerator-sized computers, which made for some spectacular system crashes. So things that caused crashes became known as bugs.

Today, *bug* refers to anything that makes your Mac act strangely and/or crash. Usually a bug is attributable to sloppy programming. If you can duplicate a procedure that makes your Mac crash, you've found a bug. Report it to the software's publisher.

bundled software Software included with the purchase of other hardware or software. For example, Jasmine bundles Symantec Utilities for Macintosh and Redux with every hard disk they sell. Microsoft includes a copy of SuperPaint with each copy of Word they sell. (This promotion may be over by the time you read this, but it was in effect for at least a year.)

bus The hardware used to connect peripherals or other computers. *Bus* also refers to hardware that transfers information between different components inside the computer.

Common examples include: SCSI Bus, NuBus (Mac II only).

byte A sequence of eight bits. Represents a single alphanumeric character in most instances.

cache (pronounced "cash") A special area of memory (RAM) set aside for frequently accessed data. Because data can be read from RAM far faster than from disk, a cache can make your computer appear to be running faster.

The cache in your Control Panel can improve performance significantly, but it can also cause trouble when used with certain applications. Unless you have more than a megabyte of RAM, set the cache to the lowest setting (32K) or turn it off. If you receive out-of-memory messages or your Mac starts to crash, turn the cache off. Also, don't use the cache on 1Mb machines with HyperCard, as HyperCard needs all of the available RAM on a 1Mb machine to operate properly.

If you have more than a megabyte of RAM, experiment with various settings to find one that suits you. Remember, the amount of RAM you allocate to the cache reduces the RAM available to run applications.

card A board that plugs into your SE or II which implements specialized functions.

CDEV (Control DEVice; pronounced "See Dev") Your System includes a modular Control Panel desk accessory; CDEVs are the modules.

To install a CDEV, just drag it into your System Folder. Some CDEVs require you to reboot before they take effect. To use a CDEV, just choose Control Panel from the Apple menu and select it from the scrolling icons at on the left side of the window.

Apple-supplied CDEVs include General, Keyboard, Sound, Mouse, and Monitors. There are also commercial utilities that are CDEVs, such as QuicKeys.

CD-ROM (Compact Disk-Read Only Memory) Optical storage medium that can hold up to 800 megabytes per disk. Data cannot be modified or deleted, though it can be copied. HyperCard is the most common software interface for accessing information on CD-ROMs. CD-ROM players connect to the SCSI chain.

These players are similar to the popular audio CD players. Most CD-ROM players can read information into your computer *and* play your favorite Pink Floyd CD. Though not at the same time.

Chooser Apple-supplied desk accessory that lets you choose among the devices, usually printers, that are connected to your Mac through the printer or modem ports.

Clipboard Special area of RAM set aside to hold text or graphics you Cut or Copy. The Clipboard can contain only one selection at a time: the last thing you Cut or Copied. When you use the Paste command, the current contents of the Clipboard will be pasted. Because the Clipboard is in RAM, shutting down or crashing causes the loss of its contents.

close box Box in the upper left-hand corner of most Macintosh windows. Clicking in it closes that window.

The close box is sometimes called the "go away" box.

Command key The key with the cloverleaf, just to the left of the space bar on most keyboards. It is always used in conjunction with at least one other key, usually as a shortcut for a menu item. When instructed to type Command-p, for example, you would press the Command key and then the "p" key (without releasing the Command key). Command key shortcuts (sometimes called "Command key equivalents") are usually listed in menus.

Control Panel An Apple-supplied desk accessory that lets you control many of the ways your Mac responds to you. For example, you can adjust mouse speed, key repeat rate, delay until key repeat, the time on your Mac's internal clock, and much more from the Control Panel.

coprocessor A chip other than the CPU that processes information. A Mac II has two processors: a Motorola 68020 and a 68881 math chip. The first processor is the CPU; the second handles only math, so it's called a math coprocessor.

copy protection Schemes that prevent unauthorized copying of software. Copy protection has unpleasant side effects. Copy-protected programs are harder to use with a hard disk, they wreak havoc with disk optimizers and backup utilities, and they can leave you without a usable copy of the program if the master disk is damaged or lost.

If you have a choice between products, choose one without copy protection over one with it.

CPU (Central Processing Unit) The chip that is the "brain" of your computer. The Macintosh uses the Motorola 68000 series of CPU chips, the Plus and SE have the 68000, the II has the 68020, and the IIx, IIcx, and SE/30 have the 68030. Power users call them by their last three digits: "it has an '030 and really screams."

Sometimes an entire computer is referred to as a "CPU."

crash Unfortunate, unexpected occurrence in which you lose control of your Mac. Most crashes are the result of bugs in software. A crash generally forces you to restart your computer, which causes the loss of all work done since the last time you saved to disk.

creator Four-letter code your Macintosh uses to identify which application was used to create which document. Many applications and DAs allow you to view a file's creator and type, (Disk-Top, ResEdit, and 1st Aid Kit, for example).

The most common creator codes are: MACA (MacWrite), MSWD (Microsoft Word), WILD (HyperCard), and MPNT (MacPaint).

cursor The little pointer on the screen. The cursor almost always moves when you move the mouse or arrow keys. Cursors come in many shapes and sizes; the watch, arrow, and insertion point are all cursors.

DA (Desk Accessory) A program that resides under the Apple menu and is available no matter what application is currently running. DAs afford much of the functionality of MultiFinder to users with only 1Mb of RAM.

Desk accessories can be installed as resources in your System with Font/DA Mover, or they can be added temporarily with Suitcase II or MasterJuggler.

Apple-supplied DAs include Alarm Clock, Calculator, and Find File. Commercial DAs include DiskTop, SmartScrap, and The Clipper.

daisy-chain A series of peripheral devices connected to your computer, or the act of connecting peripherals in such a chain. A SCSI daisy-chain usually includes one or more hard disks and may also include a CD ROM device, tape drive, scanner, or other hardware device.

The daisy-chain on the Apple Desktop Bus (ADB) always includes the keyboard and mouse but may also include a trackball or digitizing tablet.

In daisy-chains, devices are connected to each other in a series, and the last device in the chain is connected to your Mac.

data Information, usually stored on a computer in bits/bytes. More specifically, *data* refers to documents, especially database files, rather than to applications/programs.

database Application (program) for storing, manipulating, and retrieving information (data). Most Macintosh databases allow data to consist of words and/or images.

Also refers to the documents created by the application.

A database program is sometimes called a DBMS (Database Management System).

data fork All Macintosh files have two "forks": a data fork and a resource fork. The contents of each fork depend on what the file contains. Applications and System software store most of their information in the resource fork, and documents store most of their information in the data fork.

DB-9 The connector that plugs into the serial or modem ports on older Macs.

DBMS (DataBase Management System)
See: database

decryption The process of decoding a document that has been encrypted for security reasons.

defragment The process of rewriting files on disks so that they reside on contiguous sectors, done with a specialized program such as DiskExpress.

Desk accessory
See: DA

desktop   The (usually) gray area in the Finder where the Trash and disk icons appear. Also refers to the entire Macintosh interface metaphor.

Desktop file   An invisible file (meaning you can't see or modify it without special tools) on every Mac disk that contains important information for the Finder about the files on that disk.

dialog box   The little message boxes that appear when your Mac needs you to make a decision. The boxes you see when you Open or Save are examples of dialog boxes, as is the one that says "Completely erase the disk...." Page Setup and Print are other commands that bring up a dialog box in most applications.

Dialog boxes usually require input from the user—either typing or selecting a button.

DIN-8   The connector that plugs into the serial or modem ports of all Macs since the Mac Plus.

DIP SIMMs   A SIMM (Single In-line Memory Module) is a small board used to add RAM to your Mac (usually 1Mb). DIP SIMMs are slightly taller than low-profile SIMMs. If you intend to add other internal upgrades, such as an internal disk drives or an accelerator, it may be necessary for you to use only low-profile SIMMs.

directory   Usually refers to one or both invisible directory files on every disk: the Volume directory, which contains information about the disk itself, and the File directory, which contains information about the files stored on the disk.

The message "This disk is damaged" usually indicates a damaged directory.

disk
See: floppy disk or hard disk

document File created by an application. MacWrite is an application; "Letter to Mom" is a document.

double-click Clicking the button on the mouse two times in rapid succession. In the Finder, this launches or opens an application, document, or folder. In most applications that use alphanumeric characters, double-clicking selects a single word. Double-click speed can be adjusted using the Control Panel DA.

download To receive information from another computer on your computer. You can also download files from BBS's and on-line services. This is usually done with a modem, but it is now also possible to hook a Mac up directly to a micro, mini, or mainframe and download via AppleTalk or EtherNet cable.

downloadable font High-resolution fonts for use with PostScript printers. These fonts are usually stored on a hard disk. Printing is slower with downloadable fonts than with fonts that are resident in the printer.

dpi (dots per inch) Measure of resolution for a screen, scanner, or printer. The higher the number, the sharper the type and images. Your Macintosh screen displays at 72 dpi; the LaserWriter outputs 300 dpi. A laser image setter (such as a Linotronic) outputs at resolutions as high as 2,540 dpi.

driver Software required for communication with a peripheral device. For example, printing requires that a driver be present in your System Folder. The "ImageWriter" and/or "LaserWriter" files you've probably noticed in your System file (if you've been able to print successfully) are these drivers.

Another kind of driver is installed with the initialization application that came with a hard disk. This driver tells the disk how to interact with the Mac. If the driver becomes damaged, as it can from a crash or power interruption, it may cause your hard disk to crash or refuse to mount or boot.

Driver also refers to a type of resource stored in the resource fork of some DAs.

EMail (also E-Mail, Electronic Mail) Messages, passed from computer user to computer user via modem and telephone lines or a local area network.

em-dash A typesetter's term for a long dash, so named because it's approximately the same width as the capital letter M. In actuality, the width of an em-dash is equal to the typeface's size in points. So an em-dash in 12-point Helvetica is a dash 12 points wide.

In most Macintosh fonts, you can type an em-dash by typing Option-Shift-hyphen. On a typewriter, an em-dash is usually represented by a double-hyphen.

em-space A typesetter's term for a space as wide as the point size of the typeface being used. The em-space is used in typesetting for indents.

EPS (Also EPSF, Encapsulated PostScript) A high-resolution file format for storing documents; this format essentially combines a PICT image, for high resolution on the screen, and a PostScript representation, for high-resolution output.

Programs that save EPS files include Adobe Illustrator '88 and Aldus Freehand. Most page-layout programs accept EPS files for placement within documents.

encryption A process that renders data unintelligible without the proper password. Requires special software such as Sentinel (SuperMac Technologies).

en-dash A typesetter's term for a dash longer than a hyphen but shorter than an em-dash. An en-dash is approximately the same width as the capital letter N and is used to separate numbers in a series (for example, 1988–1989, or 800–538–9696).

In most Macintosh fonts, you can type an en-dash by typing Option-hyphen.

EtherNet High-speed network protocol. EtherNet can be 2–5 times as fast as LocalTalk, but it uses more expensive cable and requires a pricey hardware adapter for each Mac.

expansion card A board that plugs into your SE or II and implements specialized functions not otherwise included on the Macintosh, such as video display and processing, a variety of coprocessors, peripheral devices like modems, and network interfaces such as EtherNet.

file format (file type) The special way or ways in which an application stores information on disk. Many applications are capable of reading and writing multiple file formats.

For example, MacWrite reads (opens) and writes (saves) files in the MacWrite or TEXT file formats. SuperPaint reads and writes files in the PNTG (MacPaint), PICT (MacDraw), StartupScreen, and SuperPaint file formats.

file server A hard disk, usually dedicated to file service, on a network that allows applications and documents to be shared by multiple users. Requires special software like TOPS or AppleShare.

file-by-file (file-by-file backup) A method that backs up a disk one file at a time. It's more flexible than an image backup because it won't copy unused portions of the disk. On the other hand, it is often slower than an image backup because it reads the disk one file at a time.

filename (file name) The name of any file, application, or document. It can be up to 31 characters long and cannot contain a colon. The System software won't allow you to save a file with a colon; it will give you a dialog box that says there is a bad character in the file name.

filter Term used by backup programs to describe the ability to select (filter) what does or does not get backed up.

Finder The Finder is part of the operating System. It's the System application that manages opening, closing, moving, renaming and trashing files and folders. It also is in charge of ejecting, initializing and erasing disks. The Finder is a special system file, and can't be opened by double-clicking. It opens automatically every time you start up your Mac.

You must have a Finder and System file on any disk you use to start up a Mac.

FKEY (function key) A single-function program, accessed by pressing command-shift and a number between 0 and 9.

FKEYs can be installed as resources in your System or added temporarily with Suitcase II or MasterJuggler.

Apple-supplied FKEYs include Screen Dump to Disk (Command-Shift-3) and Screen Dump to ImageWriter (Command-Shift-4).

There aren't many commercial FKEYs, but hundreds are available as public domain software or shareware.

flat-file database A database management system that uses a single data file for all of the information. It cannot look up or utilize information stored in other data files.

floppy disk Macintoshes use a 3.5-inch, hard-shell plastic diskette. A floppy disk drive reads and writes data to and from floppy disks. Older floppy disks had a capacity of 400K, but most recent models hold 800K, and the SuperDrive that comes with the IIx, IIcx, and SE/30 can hold up to 1.4Mb.

Interestingly, once initialized, an 800K floppy disk only has 779K of space on it (The missing 21K is used by the invisible directory file and formatting information).

font A certain style of a set of characters, including letters, numbers, punctuation marks, and other symbols.

Font is often used to refer to a Macintosh typeface.

Font/DA Mover Apple-supplied application for installing fonts and desk accessories in your System file.

fragmentation Your Macintosh stores files in pieces on your hard disk. As your hard disk gets fuller, it writes files to any available space, even if that space is not contiguous. So as files are written, different parts are stored in different places on the drive. Fragmentation slows your hard disk down and may eventually cause data loss. Use a utility like DiskExpress to periodically defragment your hard disks.

gigabyte 1,024 megabytes. At present, there are no single storage devices that will store a gigabyte, though you could daisy-chain three or four high-capacity hard disks to achieve that much storage. Some tape backup systems can store that much or more on a single tape.

go away box
See: close box

gray-scale True gray displayed on screen; not just a collection of black and white pixels (dots) cleverly arranged to simulate gray, as seen on Macs with built-in 9-inch screens. Requires either a gray-scale or a color monitor.

Most desktop publishing and graphics programs which run on the Mac II, IIx, IIcx, or SE/30 are capable of displaying gray-scale information on screen. Gray-scale information is usually printed using a PostScript output device.

hard disk Mechanical, non-removable, high-speed storage device capable of holding multiple (usually 20+) megabytes of data. Most connect through the SCSI port (internal drives are the exception) and are far faster than floppy disks.

HFS (Hierarchical File System) A filing system that allows you to arrange applications, documents, and folders in a hierarchy. Files and folders at the Finder (or Desktop) are said to be first-level files. Files within these first-level folders are second-level files. If any of these second-level files is a folder, the files inside it would be third-level files. And so on. You can nest (place files or folders within other folders) about 12 levels deep, depending on available RAM. (If you open more than 12 windows in the Finder, you may get an error message saying no more windows can be opened.)

HyperCard A hypermedia application that allows storage and retrieval of text and bit-mapped graphics. HyperCard files (called *stacks*) are easily configured by the user. Any piece of information in a HyperCard file can be linked to any other piece of information.

HyperCard has been bundled with every Macintosh since August, 1987.

I-beam The cursor you control with your mouse in most text-processing programs. It is called an *I-beam* because it resembles a cross-section of a steel beam.

icon Icons are one of the things that makes the Macintosh interface unique. An icon is a small picture that represents an object or action to your Mac. For example, disks are represented by icons that look like disks, folders by icons that look like folders, and documents by icons that look like a sheet of paper. All applications and most documents have distinctive icons when seen in the Finder (desktop).

To activate most icons, double-click on the icon.

image backup Method of backing up a disk from beginning to end (sector by sector) without regard for files, folders, or the overall structure of the disk.

It does not distinguish between used and unused portions of the disk. An image backup of a 40Mb hard disk will take up 40Mb of backup media, even if only 10Mb of the hard disk contains files.

incremental backup Backup in which only files that have been modified since the last backup session are copied.

INIT (Startup Document) INITs (and some CDEVs) are small programs that you place in your System Folder and that are installed automatically at boot time. Pyro, Suitcase II, TOPS, and QuicKeys are examples. When you View by Kind in the Finder, INITs and CDEVs show up as Startup Documents and Control Panel Documents, respectively. In most cases, you can use quite a few of them simultaneously. Occasionally, there will be a conflict that will prevent your hard disk from booting.

initialize Erase a hard or floppy disk. Also called *formatting*.

information service An information service is a large, commercial bulletin board system (BBS). Such services allow computer owners with modems to access an incredible range of services.

You can make travel reservations, buy and sell stocks, download Macintosh software, and chat with other Macintosh owners.

All of the big services have local nodes in most cities, so logging on is not a long-distance call.

CompuServe has the most to offer and is reasonably priced. MacNet offers a nicer Mac interface but has fewer services.

insertion point Flashing vertical bar that tells you where you're typing in applications and the Finder (when naming or renaming an icon).

interleave The order in which your hard disk reads and writes sectors on the platter (disk). A 1:1 interleave reads every sector; 2:1 reads every second sector; 3:1 reads every third sector. Unless your manual tells you otherwise, use 1:1 for a Mac II, IIx, IIcx, or SE/30, 2:1 for a Mac SE, and 3:1 for all other Macs.

Interleave is usually specified when you initialize your hard disk for the first time. Some drives set it automatically. Using a drive formatted with the wrong interleave factor for your Mac will degrade performance.

invisible file Files that cannot be seen under ordinary circumstances. The Desktop is probably the invisible file you're most familiar with. Invisible files can be accessed only with special applications or DAs (ResEdit, SUM, DiskTop, etc.).

kerning Adjusting the space between characters to create a more pleasing effect. Kerning is usually measured in points or fractions of an em-space. Kerning is a feature of most page-layout and some word processing programs.

kilobyte (kbyte, Kbyte, or K) A kilobyte is equal to 1,000 bytes, and after bits and bytes, is the smallest unit of measure for disk space or RAM.

kludge Not quite the best way of doing something. If a function could have been implemented in a better way, it's a kludge. Or kludgy. Kludges may not be elegant but they usually work.

For example: Instead of purchasing an internal fan for your Mac, you buy an oscillating fan at the corner store and aim it at your Mac. That's a kludge.

LAN (Local Area Network) A hardware and software set-up that connects computers to other computers and peripheral devices such as printers. A LAN allows multiple computers to share files easily.

At the very least, a LAN consists of the physical cable and connectors (LocalTalk, EtherNet, etc.) and file-or disk-serving hardware or software of some sort (TOPS, AppleShare, MacServe, etc.). Other goodies like multi-user database software and electronic mail (EMail) are easily added.

landscape mode Printing a page sideways—wider than it is long. Most programs allow you to select this option in the Page Setup dialog box.

Landscape mode is often called *wide* (as opposed to the portrait mode, which is sometimes called *long*.)

launch To start up an application, such as launch MacWrite.

leading The amount of space between two lines of text, usually measured in points. Leading is a feature of most page-layout and word processing programs.

Linotronic Brand of high-resolution image-setting devices. Linotronic machines provide output from popular programs at resolutions up to 2,540 dpi. Used for typesetting.

Lisa The predecessor to the Macintosh. Reincarnated as the Macintosh XL; neither has been produced since 1985.

LocalTalk The name given to the cables and connectors sold by Apple for connecting Macs. LocalTalk cable and connectors used to be called AppleTalk cable and connectors. Today, *AppleTalk* refers to the network protocol, and *LocalTalk* refers to the wiring and connectors.

low profile SIMMs A SIMM (Single In-line Memory Module) is a small board used to add RAM to your Mac (usually 1Mb). Functionally the same as DIP SIMMs, low profile SIMMs are not as tall. This may be important if you intend to add other internal upgrades, such as an internal disk drive or an accelerator. DIP SIMMs may not leave sufficient clearance.

MacBinary A standard for transferring Macintosh files from one computer to another. Always used in conjunction with an error-checking protocol such as XMODEM, MacBinary ensures that all the attributes (that is, both data and resource forks) are included when the file is transferred. Without it, files may become garbled and may be unable to be opened on the receiving Mac.

MacBinary is the preferred way to transfer files between two Macs. When sending files to be used by other computers, you should save them as TEXT only and *not* use MacBinary.

macro A sequence of Macintosh keyboard or mouse events, programmed by the user to automate repetitive tasks. Creating macros requires additional software such as MacroMaker, Tempo, AutoMac, or QuicKeys. Certain programs have a built-in macro facility: Excel, Full Impact and QUED-M are just a few.

math coprocessor A special chip designed to speed computation. The Mac II, IIx, IIcx, and SE/30 are equipped with math coprocessors. Most accelerator products also offer a math coprocessor as an option.

MAUG (Micronetworked Apple User's Group) A group of forums on CompuServe (an on-line service) dedicated to the sharing of information about Apple computers.

megabyte (Mb) 1,024 kilobytes (K). A megabyte is slightly more than an 800K double-sided floppy disk will hold. Megabytes are used to measure RAM; 1Mb is the standard amount in most Macintosh CPUs as of this writing.

memory Where computers store information. Comes in two types: volatile and non-volatile, depending on whether the contents survive when the computer is turned off. RAM is volatile; ROM, hard and floppy disks are not. Memory is measured in bytes (and kilobytes, megabytes, gigabytes, etc.)

menu A list of commands that appears on screen when you click on a menu title. You drag down to make a selection. Menus are found in the Finder as well as in most applications and desk accessories.

menu bar The strip of menu titles at the top of the screen.

menu title Word or phrase in the menu bar that designates it as a menu. Click on it to reveal the menu. Drag down to make a selection.

MFS (Macintosh Filing System) An old system of storing files and folders. MFS was a flat, rather than hierarchical, filing system. It allowed storage one level deep—everything in every folder was stored at the same level.

MFS was replaced with the more efficient HFS when the Mac Plus was introduced in 1986.

MIDI (Musical Instrument Digital Interface) A protocol for exchange and storage of information between a computer and a musical instrument.

modem (*modulate/demodulate*) A modem is a device that allows your computer to communicate with the outside world via telephone lines.

Technically speaking, it converts digital information (bits and bytes) from your Mac into analog information (noise) that can be sent over standard phone lines, while simultaneously converting incoming analog information into digital information your Mac can understand.

motherboard The main circuit board in your Mac. It houses the most important chips, including the CPU. Macintosh motherboards

are quickly and easily swapped (by an authorized dealer, of course) for upgrades and/or repairs.

mount The act that causes a disk's icon to appear on the desktop in the Finder. (It's automatic in most cases.) More specifically, mounted refers to a disk that can be used at a given time.

You can't use a disk before it's mounted. If you insert a disk, or boot with a hard disk turned on, and no icon appears on the desktop, the disk is refusing to mount.

MUG (Macintosh User Group) A group of Macintosh enthusiasts who hold regular meetings, exchange shareware and public domain stuff, publish informative newsletters, and generally provide an informative setting for anyone who uses a Mac. There are more than 1,000 user groups in the US alone!

If you want to know how to contact the user group nearest you, call 800–538–9696 Ext. 500.

MultiFinder Apple's operating system software that allows you to have several applications open simultaneously, some of which may run in the background. Only one window can be active at a time, though certain tasks (telecommunications, disk backup, etc.) may continue even if another application is active.

nesting Placing folders within folders.

network
See: LAN

NuBus A protocol used by the Mac II series (Mac II, IIx, and IIcx) that allows expansion cards to communicate at high speeds. NuBus is also the name of the slots in the Mac II, IIx, and IIcx in which expansion cards may reside. The ability to add expansion cards easily is often called *open architecture*.

NuBus expansion slots The slots (ports) on the main circuit board of the Mac II series that allow you to add expansion cards (for example, cards for video display and processing, a variety of coprocessors, peripheral devices such as modems, and network interfaces such as EtherNet).

object-oriented graphics Graphics created by applications other than paint programs and usually stored as PICT or EPS files. An object-oriented graphics program lets you select and rearrange elements within your drawing. MacDraw is an object-oriented graphics program.

OCR (Optical Character Recognition) The ability to convert scanned text into text files rather than pictures. Devices with OCR enable you to scan, for example, a typewritten report, and then use the resulting file with your favorite word processor.

Affordable systems that really work are just now becoming available.

on-line service
See: information service

optimizer An application that rearranges files on a disk for maximum speed.

partition Division of a hard or floppy disk into multiple, separate "virtual disks." You can use each partition as if it were a separate disk. Most software allows you to password-protect partitions.

Some hard disks (Apple, Jasmine) include partitioning software; otherwise you'll have to purchase it.

Partitions are a particularly useful organizational tool if you have a large hard disk with thousands of files and folders. Unless you require password protection, the benefit of partitioning is much reduced if your hard disk is less than 80Mb or has a small number of files.

PICT File format for object-oriented graphics. PICT files can be written and read by many applications, and most page-layout programs import (place) PICT files.

In most applications that will save a PICT file, you must select "Save as" and specify the PICT format. If not, your file will be stored in the program's native file format.

Programs that read and write PICT files include MacDraw and MacDraw II, Canvas, SuperPaint, and many more.

pixel The dots that make up the image on a screen. A Macintosh screen displays 72 pixels (dots) per inch (or, you might say that a Macintosh screen pixel is 1/72 of an inch).

When you print a document using a printer that supports resolutions above 72 dpi, the screen pixels are converted to more densely packed pixels on the printed page. For example, most laser printers support 300 dpi.

pointer An arrow-shaped cursor used for selecting icons, graphic objects, and menus, and for double-clicking in the Finder.

pop-up menu A menu that appears in a place other than the menu bar. When you click on a pop-up, a menu appears. Pop-up menus usually appear in dialog boxes and are identified by a box with a shadowed outline.

port As a noun, *port* refers to a connection through which your Mac sends and receives data. Examples include the ADB, modem, printer, and SCSI ports.

When used as a verb, *port* means to convert a program to run on different computer. Many games are ported from the IBM or Apple II to make them run on a Mac. This cannot be done by the user; the publisher must do the porting.

portrait mode Printing a page with the usual orientation—longer than wide. Most programs allow you to select this option in the Page Setup dialog box; the other option is usually the landscape (or wide) mode.

PostScript A device-independent page description language created by Adobe Systems and used by the LaserWriter and Linotronic. PostScript provides a way for files created on any computer to be output at the highest resolution the printer allows.

power user Someone who uses a Macintosh better, faster, or more elegantly than you. Or, someone who can answer Macintosh-related questions you can't.

PRAM (Parameter RAM) A small amount of internal RAM, maintained by battery, that keeps your Mac's clock running and stores things like serial (modem and printer) port configurations.

Some of the more obvious signs of PRAM problems are when your Mac clock doesn't work correctly and when the Chooser forgets settings.

print spooler
See: background printing

printer driver
See: driver

processor A chip that processes information (as opposed to RAM, which only stores it). A Mac II has two processors; the 68020 CPU (central processing unit) and a 68881 math coprocessor.

program
See: application

programmer's switch Every Mac comes with a little piece of plastic called the "programmer's switch." It is actually two switches: the front switch is the reset switch and the rear switch is the interrupt switch.

The reset switch works the same as turning your Mac off and back on with the power switch. If you need to restart your Mac after a crash or freeze, you can push the reset button instead of turning the power off and on.

The rear switch, the interrupt switch, can sometimes return you to the Finder after a crash if you type the proper sequence. (See Chapter 2.)

protocol A set of rules governing the exchange of information between computers and/other computers or peripheral devices. Examples include SCSI, XMODEM, MacBinary, AppleTalk, and EtherNet.

public domain software Software to which the author retains no rights—it is available to anyone for free, usually through on-line services and user groups.

QuickDraw Internal routines, built into the Mac ROM and System software, for drawing graphics to the screen or printer. These QuickDraw routines are responsible for almost everything you see on the screen; they allow the Macintosh desktop metaphor to work the way it does.

radio button A type of button, usually found in dialog boxes or HyperCard, in which the user will click to select one from two or more choices.

The Page Setup dialog box is a good example—there are usually four radio buttons for different paper sizes. Selecting one by clicking it deselects the other choices.

RAM (Random Access Memory) The temporary memory in which your Mac stores information while it's running. RAM is sometimes known as "volatile" memory, because its contents are lost whenever you power down or crash. The first Mac had 128K (kilobytes) of RAM. The Fat Mac had 512K and the Mac Plus, SE and II all have at least 1,024K of RAM.

RAM can be expanded to 4Mb on the SE and Plus and to 8Mb on the Mac II, IIx, IIcx, and SE/30. Additional RAM allows the use of MultiFinder.

RAM cache
See: cache

RBBS
See: BBS

Read Me (Read Me documents) Plain text documents that provide late-breaking information about software. These files can be read with Apple's TeachText or any program or DA that reads text files.

If you purchase software that has a Read Me file on any of the disks, you should read the file before you install the software or use it. The file usually contains important information that doesn't appear in the documentation.

reboot Restart your Mac. Always use the Finder's Restart command. Flicking the power switch without using the Shut Down command is asking for trouble.

relational (relational database) A type of high-end database that can link information in various files. Relationships can be one-to-many, many-to-one, and one-to-one. This allows the database to look up information in other files and use it in the file currently being accessed.

Although some flat-file databases can perform a single lookup, relational databases allow you to link numerous files in various ways.

ResEdit (Resource Editor) Apple's resource-editing application. Almost everything in a Macintosh file is considered a "resource"; ResEdit gives you tools to modify (edit) them. If you know what you're doing, you can modify alert boxes, menus, dialog boxes and much, much more.

ResEdit is a powerful tool. It can destroy your files. Never use ResEdit on a master or original file; always work on a copy.

Available from CompuServe, GEnie, MacNet, most user groups, and some dealers.

resolution The term used to describe the number of dots per inch your printer or monitor produces. The Mac displays 72 dots per inch on screen; the LaserWriter prints 300 dots per inch on paper. So the Mac has a screen resolution of 72 dpi, and the LaserWriter has a printing resolution of 300 dpi.

resource fork The part of a file that contains resources used by the application, such as menus, fonts, and icons.

RGB (RGB monitor) A model for displaying video images. RGB (which stands for Red, Green, Blue) provides better resolution and color than conventional television, which uses a model known as "composite video."

RGB monitors are commonly used with the Mac II series.

restore Opposite of backup. The process of moving files that were backed up previously to the disk from which they were originally backed up. Usually done only in emergencies.

ROM (Read Only Memory) Non-volatile memory that resides on a chip inside your Mac. It contains parts of the Macintosh Operating System. It can never be erased or changed.

SANE (Standard Apple Numerics Environment) Apple's built-in implementation of the IEEE standard for computation. SANE will utilize a math coprocessor if one is available.

scanner A device that converts paper images (flat art) into graphics files (usually MacPaint or TIFF).

Scrapbook An Apple-supplied desk accessory that lets you store text or graphics. Text or graphics pasted into the Scrapbook will remain there until removed. You can copy text or graphics from the Scrapbook and paste them into most applications.

screen dump A built-in method (FKEY) for capturing the image on your screen to a MacPaint file. Press Command-Shift-3 and the image on your screen at that moment will be saved as "Screen 0." The file can be viewed or modified with any program that will open a MacPaint file.

script (scripting language) The instructions followed by a macro in either a stand-alone macro program (QuicKeys, MacroMaker) or a program equipped with its own internal macro facility (Excel, MicroPhone II).

SCSI (Small Computer System Interface; pronounced "scuzzy") High-speed data port (bus) introduced with the Mac Plus and included with all current Mac models. The SCSI bus allows up to six devices to be daisy-chained to your Mac, communicating at speeds far faster than the modem, printer, or ADB ports allow.

SCSI bus
See: daisy-chain, SCSI, SCSI ID number

SCSI Evaluator Shareware program that measures the speed of hard disks.

SCSI ID number The Macintosh allows you to connect up to six external or internal SCSI devices. Each must be assigned a different ID number (don't use 7 or 0; they're reserved for the Mac itself and an internal hard disk, respectively.) Some devices allow you to select the ID number using software; others require you to set dip switches or thumb wheels.

   If you don't use the Startup Device selector in your Control Panel to select another device, your Mac will boot from the startup device (a device with a System Folder) that has the highest ID number.

sector A small portion of a floppy or hard disk.

selection rectangle The dotted box that results from clicking and dragging. Items within the box are selected when you release the mouse button.

serial (serial port) A port for connecting peripherals to your Mac. The printer and modem ports are serial ports. A serial port is slower than the SCSI port.

shareware Try-before-you-buy software. Some of it is incredible. Thousands of programs, DAs, INITs, and graphics are available as shareware. The easiest place to get a hold of it is from online services such as CompuServe, MacNet, or GEnie. Most user groups have shareware libraries available to members.

   Support shareware. If you use it, send the developer a check!

SIMM (Single In-line Memory Module) A small board containing eight memory chips, usually totalling 1Mb, used for adding RAM to your Mac. You can have up to four SIMMs (4Mb) in an SE or Plus, up to eight in the II, IIx, IIcx, and SE/30.

size box The box at the lower right-hand corner of most active windows in which you can click and drag to resize the window.

spool (spooler, spooling) An acronym for "Store Printed Output On Line." A spooler is a device that allows printing to occur without tying up your Mac. A spooler prints your document to disk and then sends that file to the printer in the background while you continue working.

With System software releases, Apple supplies a laser spooler that works only under MultiFinder. Commercial spoolers include SuperLaserSpool and LaserSpeed.

stack A file created by and used with HyperCard.

suitcase (suitcase file) Slang for a font or DA file, so-called because their icons look like little suitcases.

sysop (*system operator*) The person who manages/operates a bulletin board (BBS).

System A file used by the Mac to start up and provide system-wide information. It can't be opened by double-clicking; it opens automatically every time you start up your Mac.

You must have a Finder and System file on any disk you use to start up a Mac.

System error
See: crash, bomb

System heap The System heap is a special area of RAM set aside for things like fonts and DAs. Increasing its size will help you if you have a large number of fonts and DAs.

If you ever see an error message with the number -108, it probably means you need more space in your System heap.

System software The System, Finder, and all related files and utilities supplied by Apple. System software is updated approximately twice a year. It is usually available from Apple dealers, on-line services, and user groups.

TeachText An Apple-supplied application that reads text files. The "Read Me" file on Apple System Software Updates is in the TeachText format.

telecommunication The exchange of information from computer to computer using phone lines and modems.

terminator Terminators are little devices that help prevent noise and strange behavior on the SCSI bus. They look like the 25-or 50-pin plug you find on a SCSI cable, but they have no cable attached. Plug the terminator into the last unoccupied cable connector in the SCSI chain. External terminators should be available from your local dealer.

Some devices, like most internal hard disks, have their own internal terminators. Others, like Apple's Tape Drive, require an external terminator.

text only File saved in ASCII format. Text files contain only letters and numbers; no graphics or formatting. Text files can be read by many applications and DAs and by almost every type of computer.

throughput The amount of actual data transmitted per second. Used to measure data transfer speeds for modems and LANs.

thumb wheel A small wheel with numbers on it used by some SCSI devices to select its ID number. You turn it with your thumb to select the SCSI ID number you want to assign to that device.

TIFF (Tagged Image File Format) A high-resolution bitmap file format that can store gray-scale information. Most scanners save in the TIFF format. TIFF files can be opened and manipulated by many applications. Most page-layout programs import (place) TIFF files.

title bar The lined bar at the top of each window that contains the file or folder's name. Clicking and dragging the title bar moves the window. A highlighted title bar, one with black stripes showing, indicates that the window is active.

trash The icon in the Finder that looks like a garbage can. You drag files you no longer need to it. Files dragged in the trash are deleted by using the Empty Trash command in the Special menu. If you don't use the Empty Trash command, files in the trash are deleted when you next launch a program or eject a disk.

type A four-letter code that your Macintosh uses to identify the application that created a particular document. Many applications and DAs allow you to view a file's creator and type (such as DiskTop, ResEdit and 1st Aid Kit).

The most common types for documents are: WORD (MacWrite), WDBN (Microsoft Word), STAK (HyperCard), and PNTG (MacPaint). Most applications are of the type "APPL."

upgrade (or update) A periodic improvement to hardware or software. Software upgrades (that is, new versions) are usually offered to existing owners at a reduced price. Hardware upgrades vary widely in pricing.

In general, *upgrade* refers to a major new version, and *update* refers to a minor bug-fix release. Unfortunately, there is no rule of thumb; many developers use these words interchangeably.

upload To send a document via modem (or local area network) to another computer.

user group A club or organization made up of people who use the Mac. Most user groups hold regularly scheduled meetings, demonstrate software, maintain public domain and shareware libraries, and offer help to novices.

utility A program designed specifically for use with a computer. Backup programs, screen savers, and macro generators are examples of utility programs.

WORM (Write Once, Read Many) A type of removable optical drive with a capacity of better than 500Mb, written to and read by lasers. WORMs are non-erasable. When they get full, you just pop in a new WORM cartridge (about $200).

write-protect The little plastic tab in the upper right corner of a floppy disk (shutter-side down, label side facing you) that prevents the disk from being written to. If you can see light through the hole, the disk is write-protected.

XMODEM An error-correcting protocol for transferring files from one computer to another via modem.

YMODEM Another error-correcting protocol for transferring files from one computer to another via modem. YMODEM offers two benefits over XMODEM; you can send batches of files (XMODEM forces you to send them one at a time) and the name of the file will be transmitted along with the file. XMODEM requires you to name the incoming file when you download it.

zoom box The little box in the upper right-hand corner of most windows in which you can click to enlarge and shrink the window.

Appendix

What you need to know about computer viruses.

There has been a tremendous amount of coverage of the computer virus problem in the mainstream media. For most of you, the threat is remote.

A virus, if you haven't already heard, is a nasty little piece of programming that replicates and spreads from disk to disk (or around your network) like a disease. Some viruses are supposedly non-destructive; others can damage files or disks with little or no warning. Nobody knows who creates stuff like this or why, but it *is* happening. Recently, two or three new strains of viruses have been discovered, and a number of Fortune 500 companies, as well as NASA, have reported viral infections.

With luck, the perpetrators will be caught. Barbara Krause, Apple's public relations manager, says: "We're taking these viruses very seriously. It is a criminal act, and we are working closely with law enforcement authorities." I hope they lock up the jerks who write them and throw away the key.

There's no cause for panic. Very few viruses have been discovered, and it appears that only a handful of users have been affected so far. Still, the potential for damage is real, and you should be aware of it. The key to keeping viruses from spreading is awareness, so tell a friend.

Speaking of awareness, it bothers me when I hear people say that the media glorifies these terrorists by giving them coverage. That may be, but it would be irresponsible to ignore the problem. I hate having to give space to such an ugly topic, but if it keeps someone from getting infected, it's worth it.

Your risk is minimal if you don't have a hard disk, are not part of a network, don't use the on-line services, and use only software you've personally copied from locked master disks. Although there was a virus in a few early Aldus FreeHand demos (fortunately a relatively harmless one), the chances of getting one from commercial products, especially after that episode, are slim. Some publishers have gone as far as using only "sterile" Macs for development and disk mastering.

Your risk is higher if you use disks someone has used on another Mac, or if you download software via modem.

If you're at risk, you should probably consider some form of protection. Vaccine by Donald Brown, Interferon by Robert Woodhead, and VirusDetective by Jeffrey S. Shulman are free or shareware programs written to help defend against viruses. They are available from on-line services and user groups.

In addition, a number of commercial software packages for detecting and eradicating viruses are also available (see the "Recommendations" section at the end of this appendix).

Because I've never been infected, I can't tell you how these programs work for eradicating (that is, removing) viruses. All of them should offer a high level of protection from infection in the first place.

If you're in a high-risk group for viral infection, you should consider one of the commercial products. Each of the publishers has stated a commitment to providing reasonably priced updates as new viruses are discovered.

Remember, the problem won't go away until every virus is eliminated from every disk. Until then, a little precaution goes a long way. If you're at risk, please take appropriate action.

Someday, the viruses will die out. But even after it's over and almost forgotten, a dark cloud will remain over the Macintosh community. The days when you could use any disk without a second thought are gone.

If I ever meet someone who created a virus, I'll ask the question posed by Don Brown in the instructions for Vaccine: "Why would we want to take such a gigantic step backward?"

After that, I'll probably have to be restrained.

Recommendations

Interferon, Virus Detective, and Vaccine are public domain or shareware and should be available from on-line services and user groups. The three commercial products available for combatting viruses are listed below.

Virex
HJC Software
P.O. Box 51816
Durham, NC 27717
919-490-1277
Plus, SE, II, IIx, SE/30
Supplied with latest version of Apple System Software.
Approximately $100

Virex is the commercial offering of programmer Robert Woodhead, who is also the author of the shareware program Interferon. Virex is capable of detecting and repairing damage caused by known viruses.

It does not provide protection between uses.

AntiToxin
Mainstay
5311-B Derry Avenue
Agoura Hills, CA 91301
818-991-6540
Plus, SE, II, IIx, SE/30
Requires System 6.0 or later
Approximately $100

AntiToxin is a virus-defense system made up of two components: an application to detect and repair damage and an INIT to protect you from infection or recontamination.

Anti-Virus Kit
1st Aid Software, Inc.
42 Radnor Road
Boston, MA 02135
800-THE-FIXR
Approximately $80

The Anti-Virus Kit consists of three separate utilities and an extensive manual. It includes an application to detect (but not repair damage from) viruses, a CDEV to prevent infection or recontamination, and an "innoculator" for protecting disks that may be at risk and that may be used in a situation in which the CDEV isn't being used.

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At last, all under one cover: insights, advice, diagnoses, prescriptions, and cures from a Macintosh expert. Dr. Macintosh (aka Bob LeVitus) provides what every user needs to know to master the Macintosh, from hardware upgrades and utility software to mouse and keyboard techniques; from hard disks and backup devices to file and disk recovery. In this book, you'll find such important information as:

- instructions for making a "disaster disk"
- strategies for backing up your work
- printer tips for getting the best results
- effective ways to work with a service bureau for Linotronic output
- the word on telecommunications and "places your computer can take you."

Dr. Macintosh even includes product information and recommendations on where to go and what to buy, and you'll get a second opinion in a special chapter containing invaluable tips and tricks collected from dozens of Macintosh users and experts.

Bob LeVitus has been helping Macintosh users for years. As Editor in Chief of *MACazine*, a magazine published using only Macintosh technology, he encountered and cured every conceivable Macintosh difficulty. He is currently a Macintosh consultant bringing his years of experience, expertise, and hands-on advice to Macintosh users of all levels, from beginning to advanced. **Dr. Macintosh** is a name you can trust.

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ISBN 0-201-51733-