

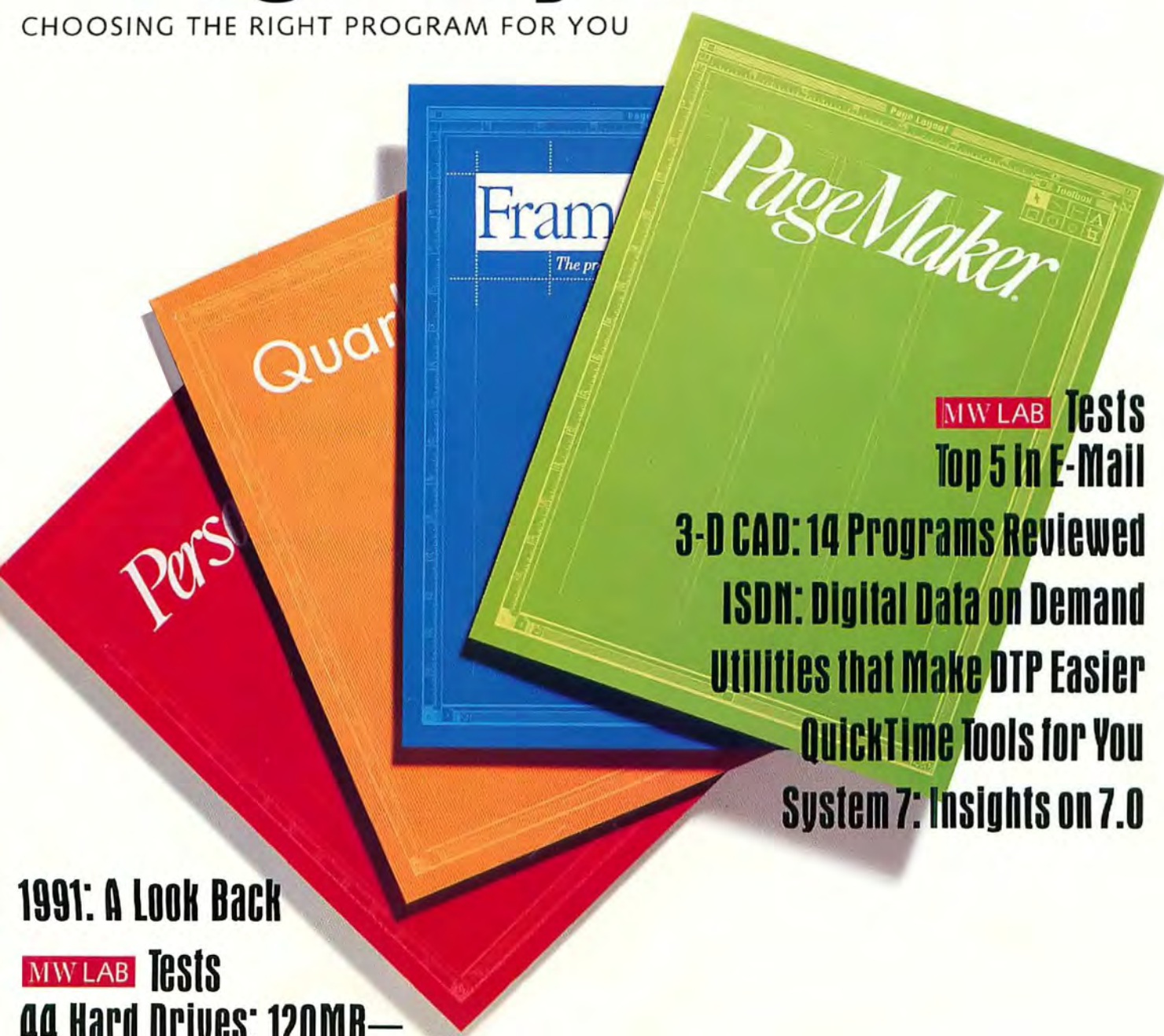
MACWORLD

THE MACINTOSH® MAGAZINE

February 1992 \$3.95 Canada \$4.95

Page Layout

CHOOSING THE RIGHT PROGRAM FOR YOU



MW LAB Tests
Top 5 In E-Mail

3-D CAD: 14 Programs Reviewed

ISDN: Digital Data on Demand

Utilities that Make DTP Easier

QuickTime Tools for You

System 7: Insights on 7.0

1991: A Look Back

MW LAB Tests

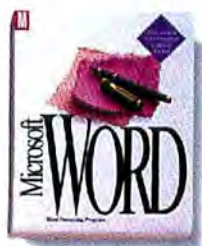
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Contents

MACWORLD THE MACINTOSH® MAGAZINE FEBRUARY 1992

FEATURES

Desktop Publishing Diversifies.....208

BY JIM HEID In page layout, one size—or DTP program—no longer fits all. We rate the top products for beginners, experts, and long-document specialists.

Enhancing Page Layout.....214

BY JIM HEID Plug-in modules and utilities are fast filling the gaps in the leading desktop publishing programs. Find out how DTP add-ons work and just how well they enhance your publishing productivity.

Seeking Midrange Hard Drives.....218

BY BRUCE F. WEBSTER Looking for a hard drive in the 120MB-to-220MB range? Macworld Lab tests 44 models and finds some standouts in the crowd.

Digital Data on Demand.....224

BY LON POOLE The analog modem may soon become a dusty relic—thanks to lightning-speed, error-free digital phone lines that promise to revolutionize the way we send and receive electronic data.

Year in Review.....228

BY JERRY BORRELL Once again, it's time for our annual look back at the past year's most memorable events in the life of the Macintosh.

Opening Up E-Mail.....234

BY DAVE KOSIUR Macworld Lab takes five major electronic-mail packages for a spin to see how they rate on speed, versatility, and friendliness.

QuickTime Tools.....240

BY ERFERT FENTON Can a video-illiterate make digital movies on the Mac? With QuickTime—Apple's new time-based software architecture—and some video capture and editing tools, it's a breeze.

3-D: Structure, Surfaces, and Movement.....246

BY DAVID POOLE Building photo-realistic three-dimensional images and animations on the Mac is still a meticulous process, but the current crop of modeling and rendering programs can bring an artist's dreams much closer to reality.



On the Cover

AS FEATURE-LADEN DTP PROGRAMS AND ADD-ONS PROLIFERATE, CHOOSING THE RIGHT PACKAGE IS HARDER THAN EVER. OUR FEATURES ON PAGES 208 AND 214 HELP YOU DECIDE. (PHOTO BY PAUL FRANZ-MOORE.)

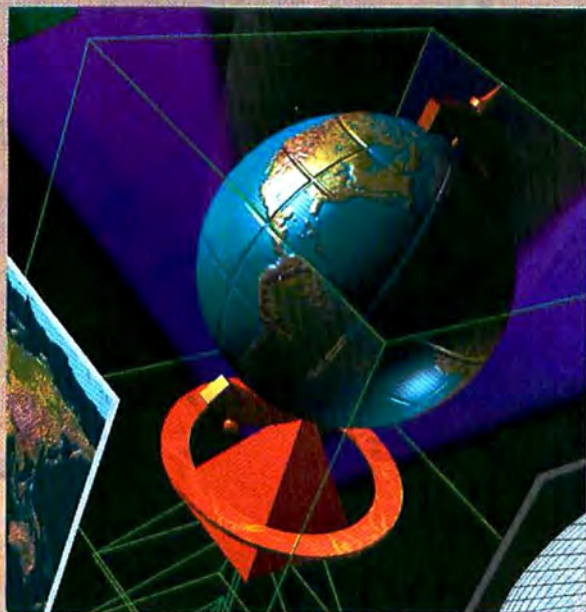
Page 218



REVIEWS

- 256 **OneScanner**
Flatbed gray-scale scanner.
- 257 **LaserScript LX**
Laser printer.
- 258 **Macintosh PowerBook 170**
Notebook computer.
- 262 **MarketPlace Business**
Direct-marketing database.
- 264 **Mariah 1.06, Multi-Ad Search 1.0, PictureBook+ 1.0**
Graphics cataloging programs.
- 266 **Fractal Design Painter 1.0**
Color paint program.
- 273 **Hard Disk Toolkit 1.0**
Hard drive utility package.
- 273 **Help 1.0**
System diagnostics tool.
- 274 **DynoDex 2.0.4**
Address book database.
- 274 **Address Book Plus 2.0**
Address book database.
- 277 **Acta 7**
Outliner.
- 277 **Azimuth 2.0**
Map-drawing program.
- 278 **Earthquest Explores Ecology**
Ecology educational stacks.
- 278 **Glider 4.0**
Arcade game.
- 280 **PageBrush Color for the Mac**
Color hand scanner.
- 280 **Verbum Interactive 1.0**
Interactive magazine.

- 282 **Aqua Blooper Piper**
Arcade game.
- 282 **3 in Three**
Interactive game.
- 284 **Backmatic 2.01**
Backup utility.
- 284 **JMP 2.0**
Statistical-analysis program.
- 287 **Michelagnolo: Self-Portrait**
Interactive videodisc.
- 287 **Instant Update 1.0**
Groupware.
- 289 **Now Utilities 3.0.1**
Utility collection.
- 289 **CheckList 2.0**
PageMaker and PostScript file scanner.
- 291 **OutNumbered 1.0**
Educational game.
- 291 **EPS Exchange 1.01**
Format-translation utility.



Page 246

Page 191



Page 187



Page 197



DEPARTMENTS

- 12 **How to Contact Macworld**
- 17 **MacBulletin**
- 21 **Commentary/ Jerry Borrell**
In search of a universal file opener.
- 33 **Letters**
- 39 **Art Beat**
BY CATHY ABES
- 55 **The Iconoclast**
BY STEVEN LEVY
A visit to high-volume dealer Computer Era.
- 63 **Conspicuous Consumer**
BY DEBORAH BRANSCUM
The storage industry in turmoil.
- 69 **Updates**
- 77 **Lab Notes**
BY TIM WARNER
- 143 **Macworld 1991 Index**
- 185 **News**
BY DAN LITTMAN AND TOM MORAN
- 293 **The Desktop Critic**
BY DAVID POGUE
- 297 **New Products**
- 305 **HowTo/Quick Tips**
BY LON POOLE
- 323 **HowTo/Getting Started**
BY JIM HEID
Alternative Mass Storage
- 331 **HowTo/Insights**
BY LON POOLE
System 7
- 337 **Where to Buy**
- 414 **Profile**
BY DEBORAH BRANSCUM
Scientist Susan Solomon battles ozone depletion with her Mac.
- 416 **Best-Sellers**

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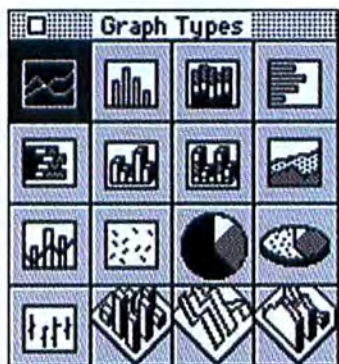
One look and Apple Chairman and CEO John Sculley called it "a spectacular product."* And that's just for starters.

This isn't just another version of Lotus® 1-2-3®, it's a spreadsheet that really grabs hold of the full computing power of Macintosh®. So, everything you've come to love about Mac® computing is now available in 1-2-3.

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Because it was designed and built just for Macintosh, Mac users will feel right at home with the menus, tools and the entire working environment of 1-2-3 for Macintosh. It includes features that push the capabilities of System 7 and everything that comes with it to the limit. Like Publish and Subscribe, Apple Events and Data Access Manager, to name a few.

Its innovative "user interface" makes working with data, text and graphics not only fast and easy, but fun. Like In-Cell Editing, which lets you double click on a cell and then type and edit directly in it. Or the Unified Work Environment, which allows you to



1-2-3 delivers the graphing capability Macintosh was made for. Select from hundreds of variations with a palette full of 3-D, pie, bar, area and scatter graphs, then directly manipulate and customize your graphs.

aaaaaa

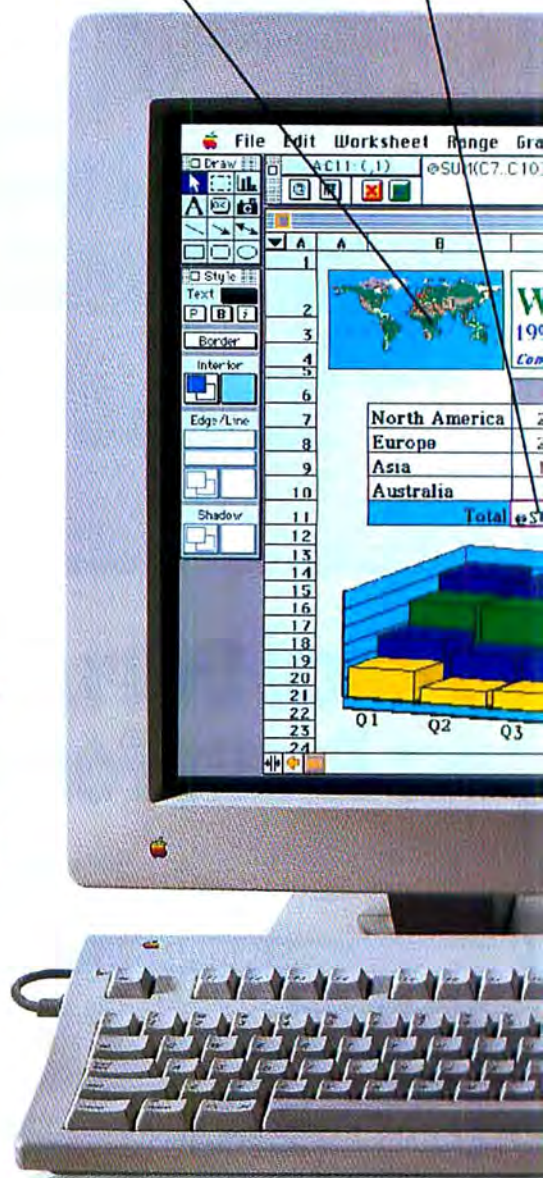
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manipulate data, text and graphics all in the same file with one set of menus. Change the color of your data the same way you change the color of your graphics. And directly manipulate data, graphs and drawn objects.

1-2-3 for Macintosh delivers the graphing capabilities Macintosh was made for in a way that's incredibly flexible. You get superior publishing and graphing functions including a rich variety

Be manipulative—Command your worksheet with direct manipulation and formatting of all data, graphs, drawn objects and scanned images.

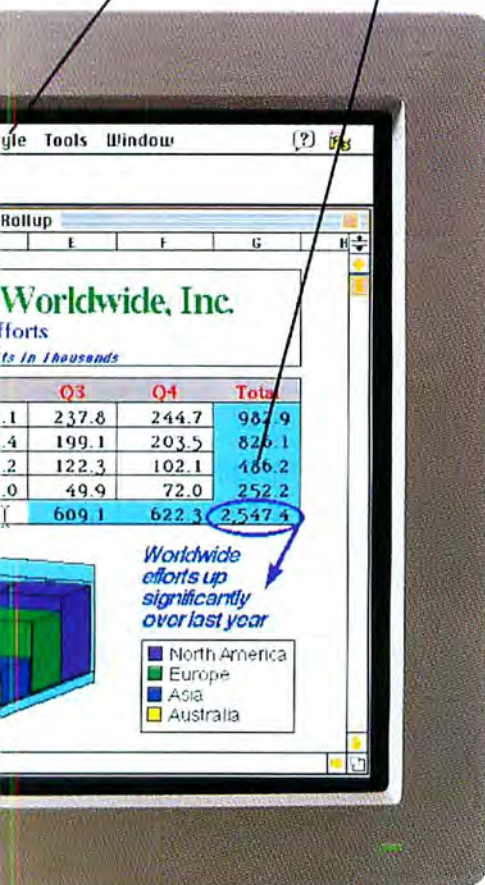
In-cell vs. Excel—Enter data or formulas directly into a cell, bypassing the console if you choose. Sounds simple because it is.



Sheet is all 1-2-3 right down to the core.

Unified Work Environment—the menu never changes and all information resides in one file—change colors, fill patterns and fonts the same way for data and graphs.

Publish and Subscribe—1-2-3 for Macintosh takes full advantage of all System 7 features. Change your data and that data will be automatically updated across your network.



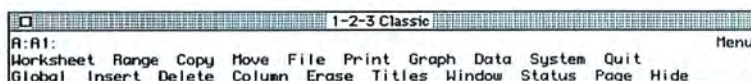
of fonts and color choices. And with print preview, you see exactly what your output will look like, instantly, so you avoid surprises at the printer.

True 1-2-3 Compatibility

1-2-3 for Macintosh is compatible with other versions of 1-2-3, giving you direct access to the spreadsheet used by over 15 million people. It even reads and writes Microsoft® Excel files. So you can make the switch to 1-2-3 and never look back. And never look better.

It's one of your favorite System 7 features, so why shouldn't Balloon Help™ be part of 1-2-3? No matter where you are on the screen or what function you're in, detailed instructions are just a click away.

Nothing delivers on the capabilities of Macintosh like 1-2-3. Maybe that's why the world's best selling spreadsheet is the world's best choice for Macintosh.



Press the slash key and the 1-2-3 Classic® menu appears on your screen. If you're coming from the DOS environment, this will make it easier for you to access familiar Lotus commands and run macros already written for 1-2-3.

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But don't take our word for it. See 1-2-3 for Macintosh for yourself. Lotus is offering a no-risk proposition for 1-2-3 for Macintosh. Just buy a copy from your favorite dealer and try it for 60 days with a full money-back guarantee direct from Lotus (Excel users can even upgrade at a special price). Or, call us today for a free demo video at 1-800-TRADEUP, ext. 6433.



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Introducing 1-2-3 for Macintosh

Kiwi POWER WINDOWS

Takes System 7 Beyond Aliases

Document management is almost a sideline for Kiwi POWER WINDOWS, the first comprehensive window management system ever offered for the Macintosh. Yet, its Work Set feature is simply better than any other.

Kiwi POWER WINDOWS was designed first and foremost as a window management system for the Macintosh. With dozens of intelligent Window Layouts, Kiwi POWER WINDOWS is the ultimate solution to keeping windows organized on your desktop, and puts an end to the window shuffling hassle.

But the creators of Kiwi POWER WINDOWS did not stop there. Building on the considerable advantage of Kiwi POWER WINDOWS' window management system, they created true *Work Sets*—collections of document or Finder windows which you can recall with a single command. Opening a Work Set re-creates a work environment exactly as you left it, replacing all windows in the same position, even on multiple monitor set-ups. All other utilities must be content with opening the folders and documents, and letting their windows fall where they may.

We compared the document and folder management abilities of the Alias feature of System 7, Microseed's HAM, CE Software's Tiles, and Kiwi POWER WINDOWS. Some of the less obvious differences are of importance. For instance, we realized that only Kiwi POWER WINDOWS was designed to handle difficult special case situations that will confuse HAM, such as when two windows have the same title (HAM simply forgets about one of them). We were also surprised to find out that Tiles used up 512K of RAM and took four times as long to open 15 Word documents than Kiwi POWER WINDOWS.

Compare for yourself and discover the superior capabilities of Kiwi POWER WINDOWS!

Features Comparison

Kiwi POWER WINDOWS Work Sets vs. HAMlets vs. Project Tiles vs. Aliases

	KPW	HAM	Tiles	Alias
Opens multiple items with one command	●	●	●	●
Opens items in user-defined order	●	●	●	†
Opens folder windows	●	●	●	●
Opens disk windows	●	●	●	●
Restores View mode in Finder	●	●	●	●
Restores window position	●	●	●	●
Restores window size	●	●	●	●
Always accessible	●	*	††	††
Takes snapshot of open documents	●	●	●	●
Can reside and be launched from anywhere on your disk	●	●	●	●
Works with removable media	●	●	●	●
Allows user to customize icons	**	**	●	**
Works with System 6	●	●	●	●

† The user specifies the order in which aliases are opened.

* HAMlets are always accessible from the Apple menu, but saving requires opening the HAM control panel.

†† Aliases can be placed in the Apple Menu Items folder for access within applications.

** Under System 7, any Finder icon can be customized through the "Get Info" dialog box.

All tests were conducted on a Mac IIci, using ver. 1.0 of all products.

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"I've waited a long time for a product that does what Kiwi POWER WINDOWS does. It's HOT!"
Bob Le Vitus, Author of Dr. Macintosh

"I think my System 7 experience will be better due to KPW. I love this product!"
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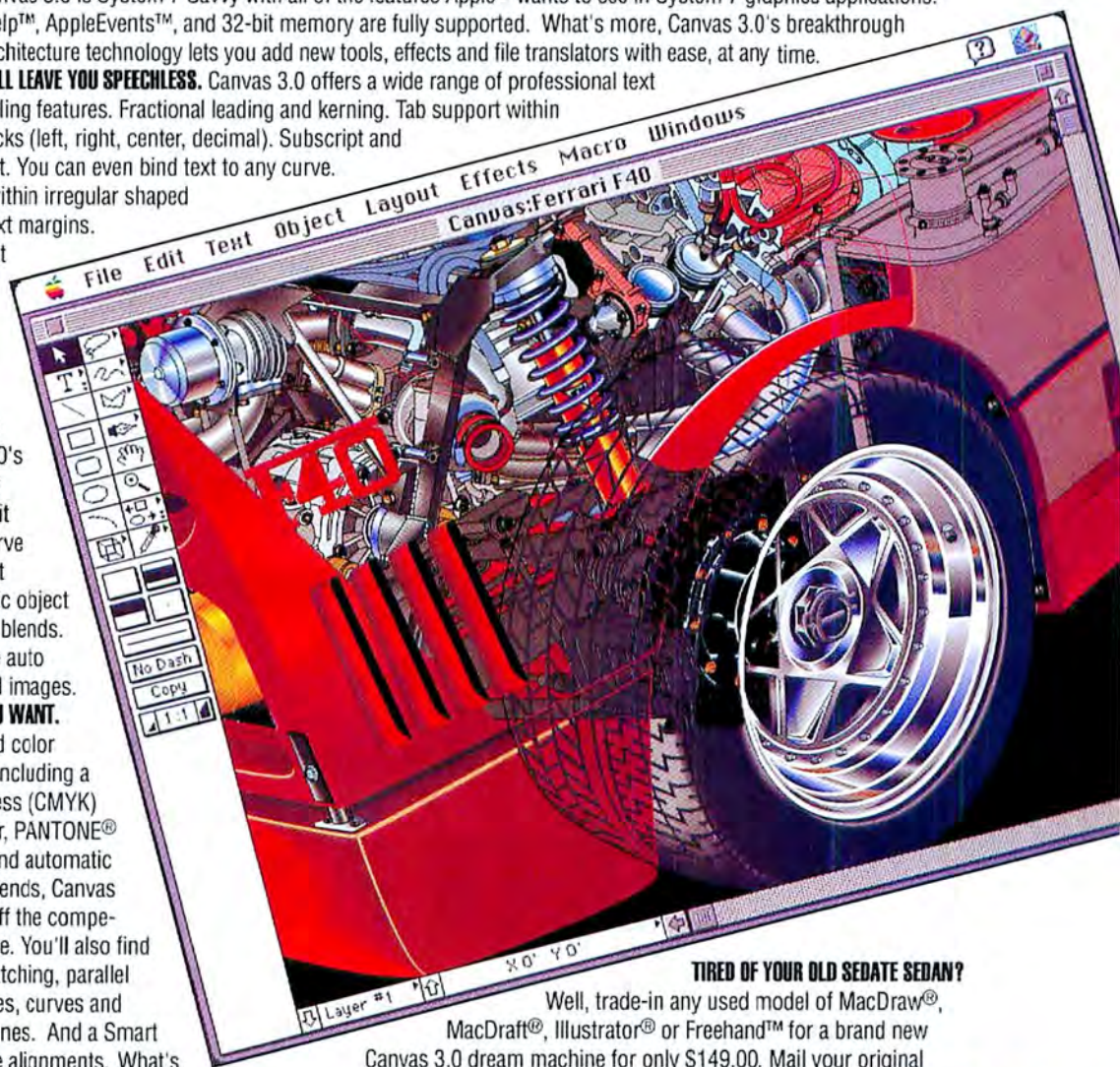
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The Evolution of CAD

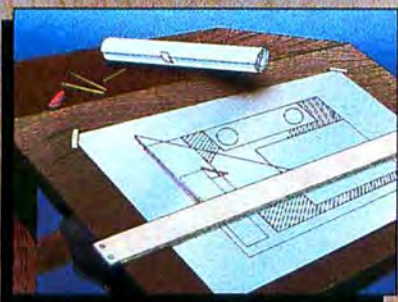
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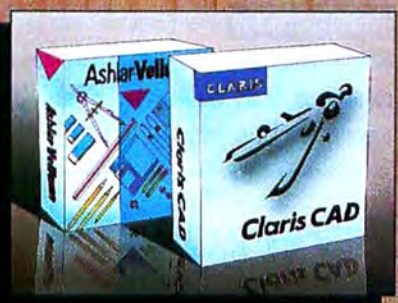
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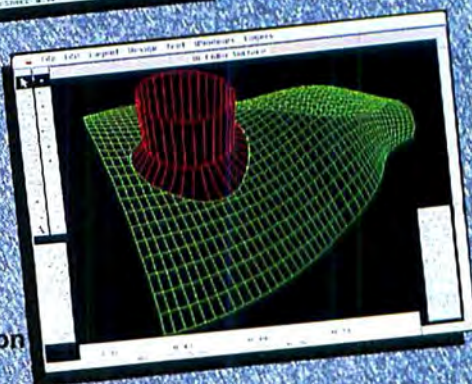
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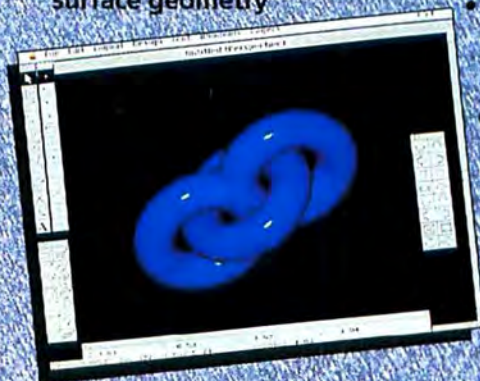


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3 Free Solutions.

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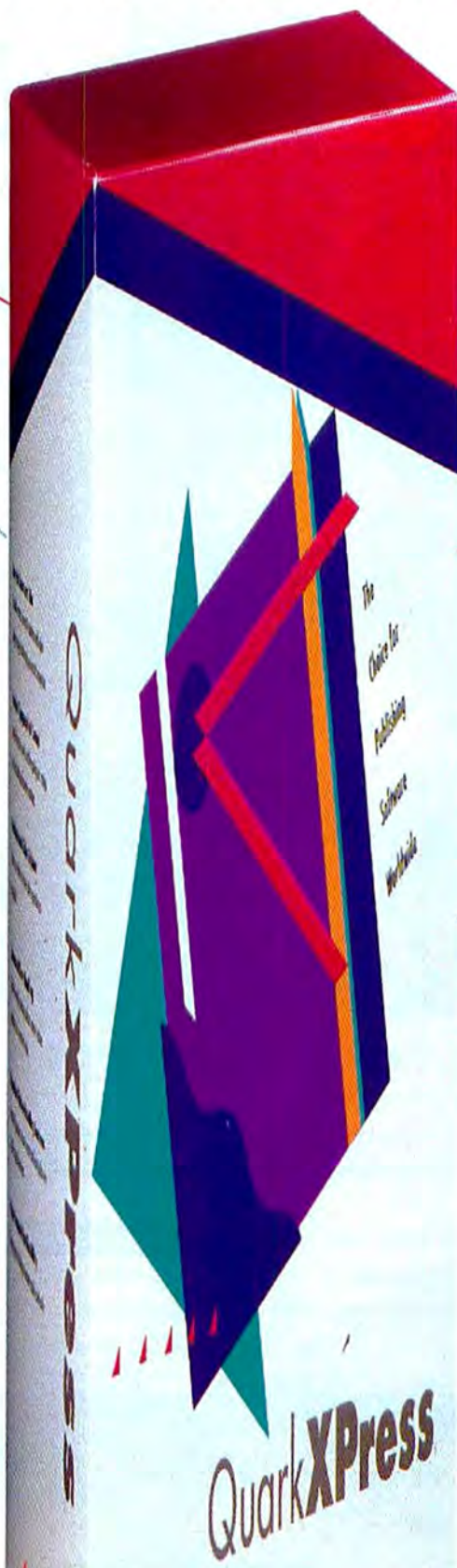
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MacBulletin

L A T E - B R E A K I N G N E W S

Fair Witness has been upgraded. Version 1.1 of Chena Software's (215/770-1210) combination brainstorming and planning tool opens and saves files faster, imports tables, performs calculations between columns, and supports AppleEvents, including publish and subscribe.

Virtus Does QuickTime: Version 1.1 of Virtus's (919/467-9700) 3-D modeler with real-time walk-through capability will be able to save walk-throughs as QuickTime movies.

MIDI Control Standard: The MIDI Manufacturers Association (213/649-6434) and its Japanese equivalent have agreed on a standard for using MIDI to control stage and performance equipment.

Business Sense has been acquired by Wyoming Software (307/789-7257), which is marketing the accounting package and developing an upgrade. The current version lists for \$199.

PosterWorks Goes Pro: PosterWorks 2.1, from S.H. Pierce (617/395-8350), has built-in color-calibration tools and can scale groups of objects. The company has also published Bureau Edition, a special version of PosterWorks for service bureaus.

Apple has appealed the tariff on flat-panel displays to the Court of International Trade. The higher cost of the displays used in the PowerBooks has forced Apple to move some production offshore.

Jasmine's court-appointed trustee in the company's Chapter 7 bankruptcy is Ed Towers, who can be reached by writing to 1255 Post St.,

#404, San Francisco, CA 94109. To contact the bankruptcy court for claim forms, call 415/705-3200 and refer to case number 3-90-00964T-TC. (Both DriveSavers [415/883-4232] and MiPro III [415/306-1100] are offering Jasmine drive owners 25 percent discounts on normal repair services.)

Mitsubishi's new displays measure 20, 26, and 37 inches diagonally. The new members of Mitsubishi's (714/220-2500) Diamond Pro series offer resolutions up to 1280 by 1024.

Farallon Sells MacRecorder: Macro-Mind/Paracomp (415/442-0200) has acquired the sound-input device and its SoundEdit software. Farallon (510/596-9100) also plans to sell off MediaTracks and unannounced multimedia products, to focus on networking.

Virus and Security Information: The 870-page proceedings from the fourth annual Computer Virus and Security Conference are available for \$100. This year's conference will be held March 12 and 13 in New York. For information, call 800/835-2246 ext. 190.

Tactic Back in Nest: Tactic Software was started in 1990 by a former Olduvai manager with several software packages inherited from Olduvai. Tactic and its expanded line has been reacquired by Olduvai (305/665-4665).

Apple supports the PowerBook with a toll-free phone number—800/767-2775—that owners can call any weekday. Support technicians will try to fix problems, direct the user to a support center, or help arrange pickup and return of the notebook Mac. **m**

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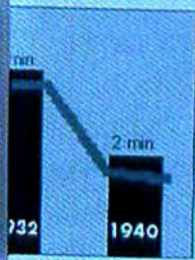


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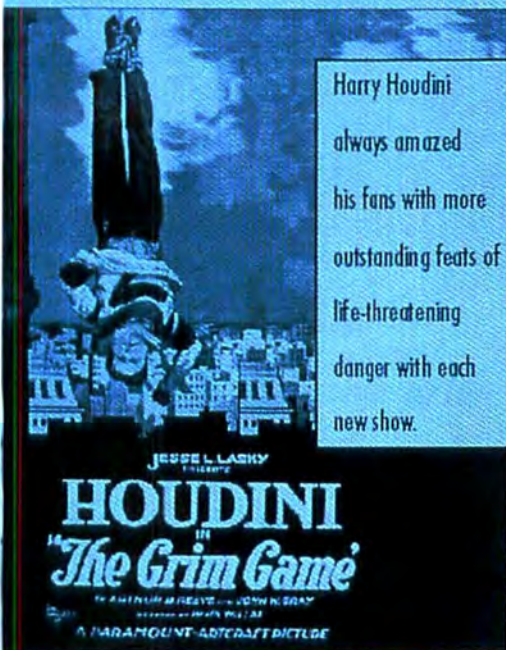
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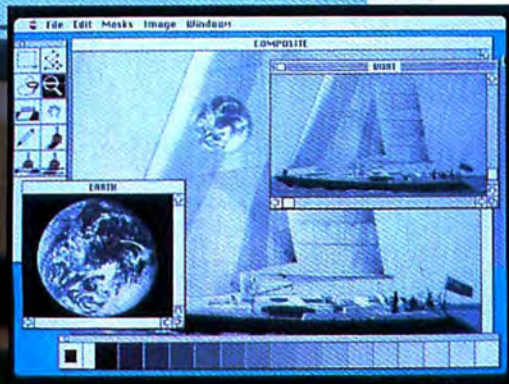


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Why Can't I Open This File? Or, Why John Warnock May Do It Again

BY JERRY BORRELL

IT'S ONE OF THOSE TYPICAL mornings. I've got too much to do, I'm fretting away with my Mac, the phone, a visitor, and small mountains of paper on my desk. I'm working with AppleLink, Apple's online information utility, trying to download a presentation for an upcoming conference. After doing the dance of a thousand small irritating things with AppleLink, like expanding a file in order to open it, I find myself confronted with a series of dialog boxes.

I'm just trying to look at this presentation, doing other things while my Macintosh IIcx slowly grinds away (I'm running System 7.0, what can I tell you). I'm not really paying attention to the Macintosh, just multiprocessing as usual. Finally it dawns on me that I have to give my full attention to the machine, because it clearly is not just making me wait, it's telling me it can't do what I want it to do. Hasn't that ever happened to you? You're working away on your computer, your attention divided between too many things at once, and suddenly you realize that you're stuck in a loop, not going anywhere.

My dilemma, I have come to realize, is all too familiar to any computer user. The person who wrote the presentation was working in some other application and saved his document in a format that my Mac doesn't recognize and my application can't open. Even choosing By Kind in the Finder's View menu won't tell me what kind of document it might be. So now I get to play "Guess what application someone else used?" This might make an interesting party game for some, but for most of us it represents one of the most frustrating and elusive problems in all of computing. And even if you were (as I was) eventually able to determine which application the file was created in, it wouldn't really solve the problem if you didn't have access to a program that could open it.

I am sad to say that as we progress along the road to computing of the future, this situation does not seem to be improving. (One possible exception is Adobe Photoshop, which has become the graphics software user's universal can opener; Photoshop can convert most graphics file formats into one you'll probably be able to use.)

Last year I wrote about this same issue, in relation to graphics file formats, and problems that I was having in trying to paste a graphic drawn in Aldus FreeHand into Microsoft's sadly neglected presentation program PowerPoint. It really didn't work. A year later Microsoft is still letting PowerPoint languish, and the situation with EPS, PICT, and TIFF formats is no better (except in situations in which I can call on Photoshop).

The inability to translate information from application to application, and from computer to computer, is probably the most aggravating problem that computer users face. It seems to happen most often with text-based documents, but graphics files are similarly troublesome. And now video or digital media has the potential to become yet another arena of incompatibility.

Presidents of computer software companies frequently proclaim that they intend to solve the problem, but what they are actually saying is that they intend to add software extensions to their own programs that will allow for the exchange of data between their applications and other applications. Still, I took it more seriously on the day in November when John Warnock, the CEO and co-founder (with Chuck Geschke) of Adobe Systems, sat down opposite me and earnestly made the case that

Adobe, developer of PostScript, would be the company to provide the Rosetta stone for electronic documents.

Back at the (Computer) Ranch

MEANWHILE, HERE I AM STUCK TRYING to access the document sent to me by one of Apple's executives when a dialog box finally tells me to open the document from within WriteNow, the T/Maker word processor. Ordinarily I use WriteNow as my word processor, but I had been stripping all the applications off my IIcx in preparation for upgrading it (with a logic board) to a Quadra. In the end, I copied the file to a disk and asked a friend to open and print the document for me. I was familiar with this routine because the editor of *Australian Macworld* uses Paragon Concepts' word processor Nisus and often sends his files to others in a Nisus format, much to their bewilderment.

But wait, you say. Using Microsoft Word, you could have opened those files. That's true, it is possible. Or I could have used the nearly impossible AppleTalk Filing Protocols (AFP), and their accompanying translators from DataViz. My point, however, is that the process is not convenient, it's not easily understood, and it's not something that anyone in a hurry would want to deal with.

Universal Document Architecture

THERE HAVE BEEN MANY attempts to provide an interchangeable file format for documents. Even the federal government has encouraged groups of manufacturers to work together on standards such as DCA (Document Content Architecture). Xerox, Hewlett-Packard, and other major



The inability to convey information from one format to another is probably the most aggravating problem computer users face

companies have spoken about interchangeable formats for years. Microsoft's Bill Gates has repeatedly talked about the need for a document interchange format. Most recently, Apple Computer itself has been at the forefront of development for the RTXT (rich text) data interchange standard—yet another attempt to devise a file format that will allow documents to retain their style, font, and formatting information across applications and platforms. RTXT has the support of dozens of computer industry vendors, but the standard addresses only a few aspects of the problems of documents produced by different applications on different manufacturer's computers.

Glue and DiskPaper

TOM EVSLIN OF SOLUTIONS, INC., one of the Macintosh's lesser-known developer heroes, introduced a product several years ago called Glue (and later, its successor, SuperGlue) that would produce a sort of electronic photocopy of a document that could be sent to another Mac, where it could then be viewed. The problem with Glue was that the files it produced were only images—because there was no intelligence associated with these

documents, you wouldn't be able to edit their text.

Reese Jones at Farallon Computing was the next person to take up the challenge of enabling computer users to read documents regardless of the application of their origin, and regardless of whether the user possessed that application. That product, called DiskPaper, is still in the works at the time I'm writing this column, but is nevertheless widely used. Many developers now ship user instructions for their programs as DiskPaper documents. A DiskPaper document contains page, format, text (both style and font), and graphics. The user is able to open any DiskPaper document because the document carries with it a "reader" or "viewer" that allows that to happen.

Adobe Is Interested, Too

SO I HAVE TO ADMIT IT WAS NOT A revelation to me when, in a meeting with Adobe Systems, I learned that the company is interested in the problem of a universal document architecture. PostScript, after all, is often touted as the single most powerful standard in the computer industry. Given the reality of the widespread use of PostScript in printers, that is a

credible claim. Adobe is one of the country's fastest-growing computer companies; fourth-largest seller of applications for the Macintosh; one of the largest sellers of typefaces in the world; the largest provider of technology to printer manufacturers; a developer of system-level software for IBM, Next, DEC, and others; and most recently, a developer of semiconductor products.

Adobe Systems is definitely a company to be watched, unlike, say, Claris, because Adobe is one of those few companies that are capable of posing a real challenge to Microsoft's dominant leadership. Although Adobe has exhibited strong marketing clout, it is not a company driven by marketing or venture capital. And more important, its founders have the knowledge to develop solutions to people's problems. Adobe also has a solid track record for taking its founders' ideas and translating them into a marketplace standard.

Does Adobe Have a Shot?

THE REAL ISSUE, ACCORDING TO Adobe cofounder John Warnock, is not the problem of opening different Macintosh applications. Instead Warnock

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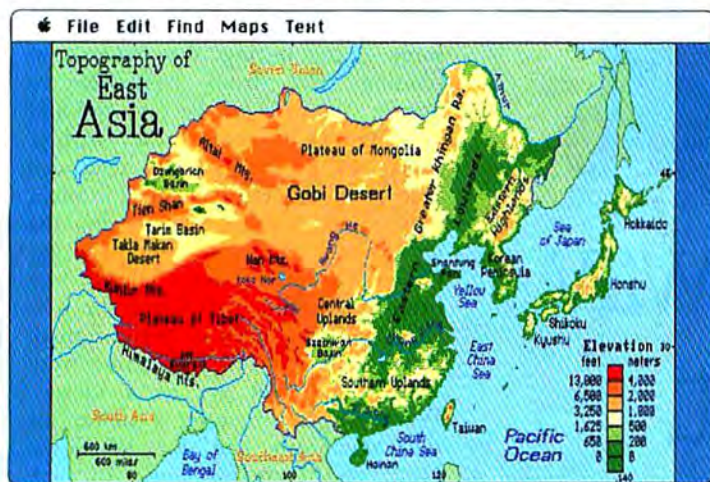
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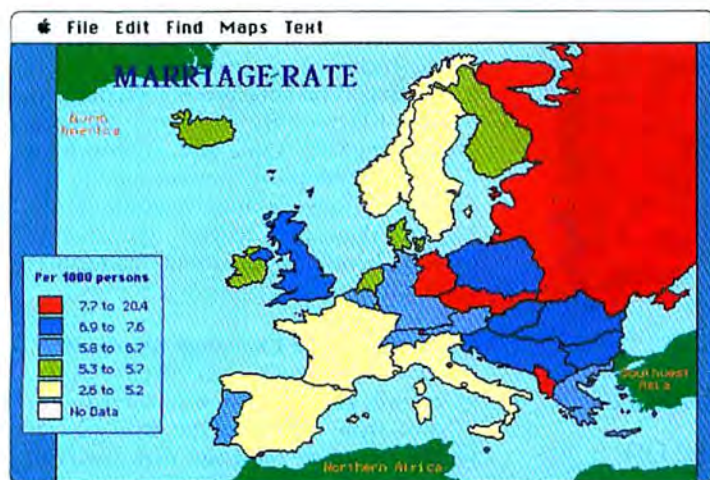
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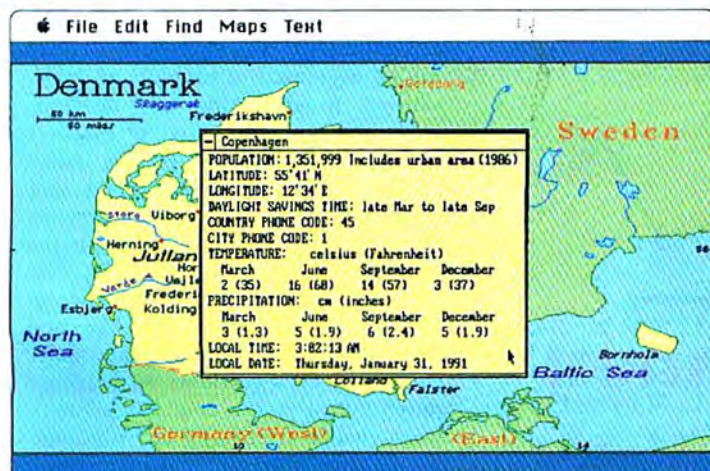
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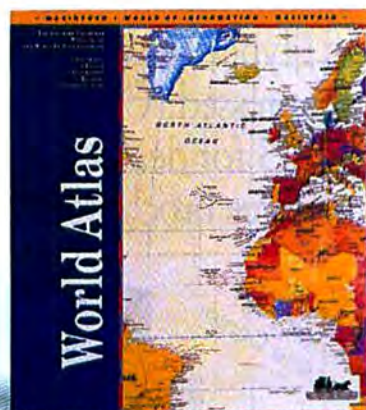
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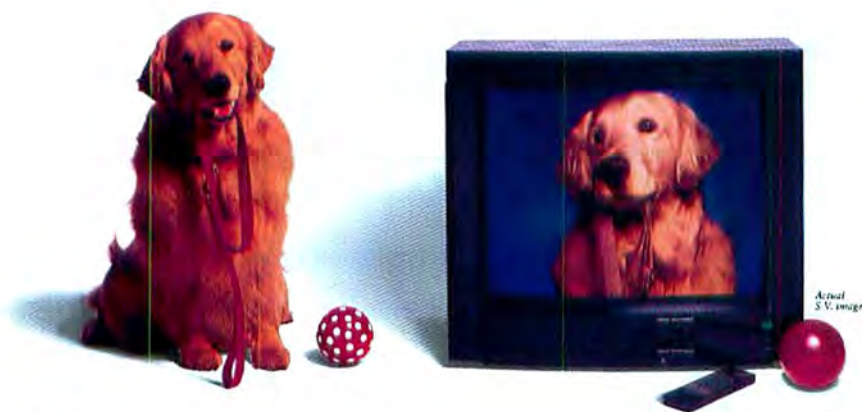
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Warnock is looking at the users of all computers, attempting to find a way for documents from any computer and any application to be opened and read by any others.

His approach to this potential miracle comes from lengthy experience with finding ways to make computers and their applications drive printers. According to Warnock, at some point during the process of sending data from computer to printer, the data can be captured and interpreted. In combination with a subset of PostScript, that data can then be used to create a new document that mimics the old one—giving the new document all the type, page geometry, graphics, and style of the original document. To view the new “mirror” document of your original, you will need a new application from Adobe that will act as a viewer. Warnock plans to offer a viewer for the Macintosh and for Windows, Next, and Unix machines. In fact, Adobe already has demonstrable versions of each product.

It takes a few seconds for all of this to sink in. A company that has the technical expertise to lead dozens of larger manufacturers—a company that has recently withstood an open challenge by Apple and Microsoft to its leadership—is announcing its intent to solve a long-standing problem that the federal government and hundreds of other companies could not.

Could Adobe Challenge Microsoft?

GIVEN ADOBE'S PREVIOUS TRACK record, and my all-too-obvious prejudice with regard to the strengths of the company, the issue that occurs to me as I conclude this column is not whether Adobe Systems has a chance to succeed, but whether this new effort has the potential to make Adobe as important as Microsoft. Today Adobe Systems is a supplier of applications, programming and development tools, and parts of various operating systems. It is this latter development of printing, video, and graphics aspects of operating systems that gives Adobe a natural path toward providing its own operating system. Given the ambition of John Warnock and Chuck Geschke and their seven years of experience wandering the back corridors of the computer industry, the company actually has a chance at growing up to become what Lotus, Borland, and even Apple aspire to. **m**

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MacWeek, February 1991

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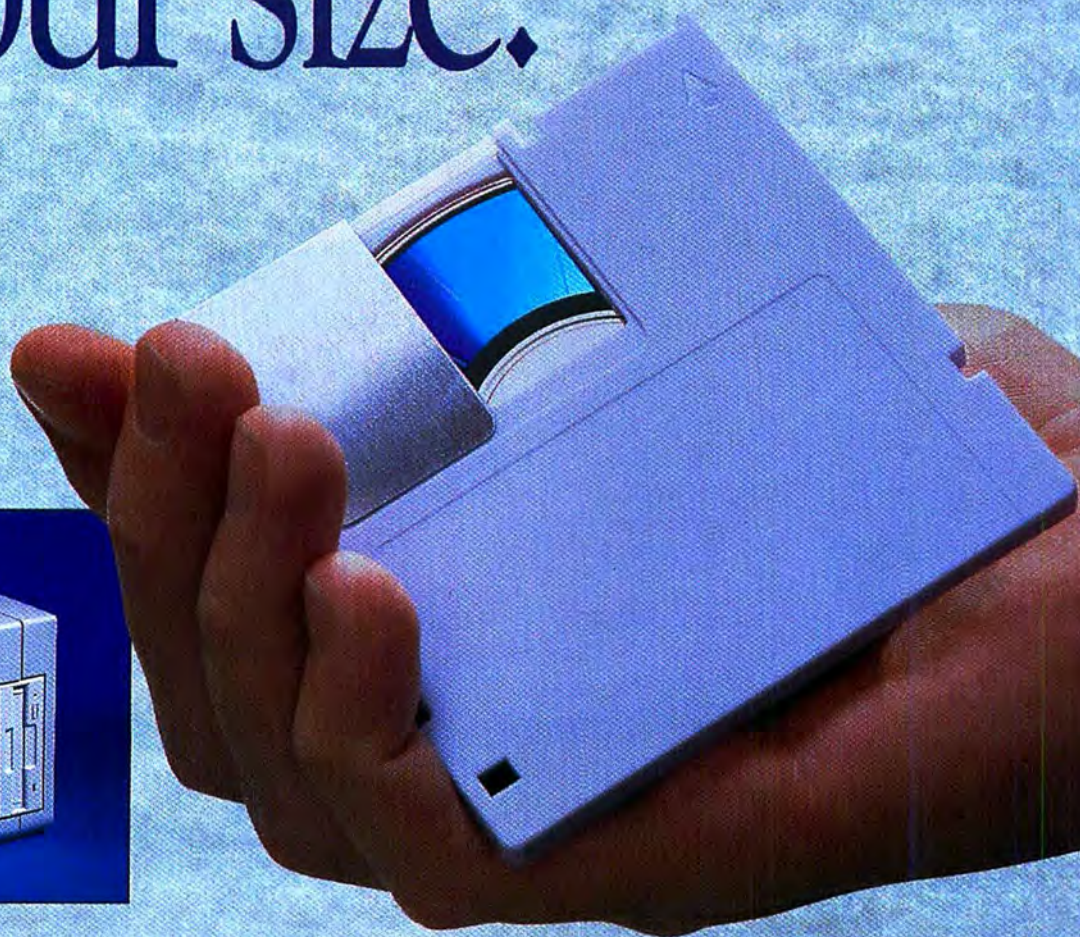
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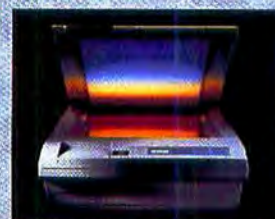
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Macworld, June 1991*



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Letters

FEBRUARY 1992

Blue about Apple

MR. LEVY IS A WHINING, hopelessly pseudo-politically correct fool who has no sense of the future of the computing industry or of the nature of life in a market economy (*The Iconoclast*, October 1991). Apple has realized that the value of idealism must be tempered with an eye toward profit, and IBM has seen the value of making its products more user-friendly. What matters most is what I do with the machine, not who built it!

Tom Igoe
Somerville, Massachusetts

IT IS REFRESHING TO HEAR FROM someone who feels the same as I do, that the Apple has ripened and is starting to rot.

James Harris
Fairburn, Georgia

PLEASE REMEMBER THIS: EVEN higher on the Apple credo than "Hate IBM," even higher than "the rest of us," is a passion for changing the world. That's the line Jobs used to recruit Sculley. That's the line that brought a lot of us here.

Even though we've built a better mousetrap, 90 percent of the market has conspicuously declined to beat a path to our door. So, if we're to take our mission as seriously as you seem to want us to, we need to find some breakout strategies. And yes, in the process, Apple will change. But can anyone expect to change the world and not be changed in the process?

Michael Markman
Manager, Apple Creative Services
Apple Computer
Cupertino, California

THOSE OF US IN THE TRENCHES who have to deal with multiple platforms have been happily converging Apple and IBM for some time now. It is only now that Apple and

IBM, worried about having to really compete, with users escaping from separate marketing ghettos, have cobbled together the latest standard.

Steve Doyle
Kamuela, Hawaii

Rereviewing DesignStudio 2.0

STEVE ROTH'S REVIEW OF DesignStudio (November 1991) contained many errors and misstatements. Contrary to Roth's review, even Macintosh neophytes cut the process of placing elements on a page to two or three steps using keyboard commands. DesignStudio does allow one to set automatic preferences for a document. DesignStudio also allows the user manual control over minimum, maximum, and optimum word-spacing and letterspacing values for any character or word, not just for any paragraph (as in PageMaker and QuarkXPress).

Brent A. Duncan
La Selva Beach, California

DESIGNSTUDIO'S STYLE SHEETS are more flexible than either PageMaker's or QuarkXPress's, which only allow for one style per paragraph. Furthermore, I wouldn't want to edit rotated text while standing on my head, as QuarkXPress forces me to do.

Jim Alley
Savannah, Georgia

YOU WRITE THAT HYPHENATION and justification apply to the whole document—but you can apply hyphenation and justification to any range of selected text. You write DesignStudio works only with PostScript printers, but a 2.5 version is in the works for the beginning of the year that will offer full QuickDraw support.

Last, your review did not mention that only Letraset offers unlimited, toll-free

continues

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Circle 44 on reader service card.

The typical costs of data recovery done by DriveSavers range from \$150 to \$500 (Conspicuous Consumer, December 1991).

MacSPOC was written by Dan Adamo ("E-Mail in Space," Macworld News, December 1991). It does not display tracking stations or emergency reentry information. Also, the Apple engineer who worked on the Macintosh's Communications Toolbox is Byron Han.

The correct number for Harris Laboratories is 612/941-2948 (New Products, December 1991).

The correct telephone numbers for HyperBible are 719/594-4884, 800/777-1841, and fax 719/594-4271 (Where to Buy, December 1991).

The figures for SE/30 drive performance in "Macintosh Classic II: Improving on a Theme" did not include a Photoshop test; the figures for the drive's performance in "Macintosh Quadras: Power but No Pizzazz" did (both articles December 1991).

The Bernoulli Transportable 90 does not need cleaning cartridges (Reviews, December 1991).

The Pantone Matching System, Pantone-approved color-printer specifications, and the Pantone Professional Color Toolkit ("All about Color," January 1992) are products of Pantone, Inc. The Toolkit was developed by Pantone and Radius and is distributed free to Pantone licensees by the two companies.

free support. Both Aldus and Quark charge for support after 90 days.

Merrill Zoldan
Technical Support Manager
Letraset Graphic Design Software
Paramus, New Jersey

Please see our January 1992 issue for corrections. Steve Roth replies: Hyphenation and justification settings do apply to a whole document; users can turn them on and off for selected text, but can't adjust them for selected ranges or paragraphs. I consider QuarkXPress's ability to rotate in .001 increments better than DesignStudio's .1-degree increments. DesignStudio doesn't offer the trapping control of QuarkXPress. What's wrong with DesignStudio's styles? You can't, for example, apply any formatting to a piece of text if that kind of formatting is included in a style that's already been applied to that text, such as when you want to

continues

make a word italic in a paragraph of text that's in a style that includes the bold attribute. Or, suppose you style your copy in Microsoft Word and import the styled copy into a DesignStudio document with identically named but differently formatted styles. You'd expect that DesignStudio's styles would override those on the incoming file, but they don't. In fact, as you keep importing more Word files, DesignStudio keeps adding new versions of each style, ad infinitum.—Ed.

Mail on Mail-Order Macs

THIS YEAR I PURCHASED OVER \$9000 in hardware and software by mail order, and I am happy to share that I've experienced none of the problems you reported in your article (*Conspicuous Consumer*, November 1991).

Something you may want to look into further is why there is such disparity in shipping costs from one vendor to the next. I found prices to vary by as much as 20 percent.

*Randall W. Smith
Beacon Falls, Connecticut*

MASTERCARD AND VISA PROHIBIT merchants from charging surcharges on credit card purchases. Banks are the first line of defense against this practice, but are often remiss in enforcing the rule.

*Clinton Baller
Birmingham, Michigan*

YOU LIST THAT WE ONLY OFFER \$2-per-minute technical support on purchases. Actually, we only recently offered a 900 line to any consumer whose products are out of warranty or were never purchased from us, or who just need some expert Mac assistance. It is a completely separate program that would not apply to anyone buying new equipment from us, in which case we have a toll-free technical-support 800 line.

*Kevin Anderson
Product Manager, MacFriends
Portland, Oregon*

Complex Accounting

STEPHEN L. NELSON'S ARTICLE "Straightforward Accounting" (November 1991) oversimplifies the task of selecting information software.

In today's competitive marketplace, surviving companies are not content to accurately track and report historical accounting information. The accounting/information system should be a tool to make future decisions. A matrix of 50 items does not accurately rate a small

package, let alone the mid- and high-range packages with thousands of fields, features, and interfaces between modules.

*Gloria B. Morris
Portland, Oregon*

Looking for MaxAppleZoom

WOULD LIKE TO KNOW IF YOU can provide me with a mailing address for Naoto Horii so that I can

purchase his cdev MaxAppleZoom 1.3, mentioned in David Pogue's article (*The Desktop Critic*, October 1991). If you cannot provide that address, perhaps you can give me information about some other contact.

*David Owens
Chapel Hill, North Carolina*

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538-9696 ext. 500 for information on a local user group); and mail-order clearinghouses such as Educorp (619/536-9999 or 800/843-9497) or the Public Domain Exchange (408/496-0624 or 800/331-8125). The program works only on single-monitor Mac II systems and the Apple standard 13-inch color monitor.—Ed.

ELF Debate

WITH ITS LATEST SET OF electromagnetic radiation-related articles ("Seeking ELF Relief" and *Conspicuous Consumer*, October 1991), *Macworld* is seriously misleading its readership about the complexity of the problem. A reader comes away with the conclusion that the *only* serious threat to health from electromagnetic radiation (from any source) is the magnetic fields in the ELF frequency band. The concern about these fields is justified, but not to the exclusion of all others.

At the NIOSH conference referenced in *Conspicuous Consumer*, the operating principal established at the shielding session was that *both* the electric and magnetic fields of a system must be reduced. The Swedish guideline is important because it limits both electric and magnetic-

field emissions from VDTs. The reader will also conclude from the article that the IEEE standards being proposed in the U.S. are equal to the Swedish MPR II. Not mentioned is that the IEEE specs allow ten times the ELF electric-field strength of MPR II.

A final but critical concern: There is a real question of safety in installing the E.L.F. Armor internal shielding device from Fairfield Engineering. The manual calls for the installer to wrap a ground wire around an insulated screwdriver and, while holding the insulated end of the screwdriver, discharge the high voltage that has accumulated in the CRT. How can *Macworld* justify promoting such a product?

Michael L. Hiles
President and CFO, NoRad Corporation
Santa Monica, California

The E.L.F. Armor manual warns that only a qualified technician should install the device. According to Fairfield Engineering president George Reid, the device "has been redesigned and improved many times with the purpose of making it safer and easier to install and to lower emissions." Even so, modifying a display can be dangerous; if you buy an E.L.F. Armor device, please protect yourself from injury by having it installed by an Apple-certified technician.—Ed.

Failing Floppies

OFFER A RESOUNDING "AMEN" TO Lon Poole's admonition about formatting 800K floppies to 1.44MB capacity (*Quick Tips*, October 1991). I wanted very much to believe the claims of disk-punch-makers that there was no difference except that little hole. I bought a ton of 800K floppies and proceeded to punch them with glee and initialize them at 1.44MB. I stored a year's worth of work on about 40 of these punched floppies. It was only after 6 months that I needed to access this data and they began to fail. What a nightmare. Just because a disk will format doesn't mean it will retain data over the long haul.

Mark Walker Rhodes
Dallas, Texas

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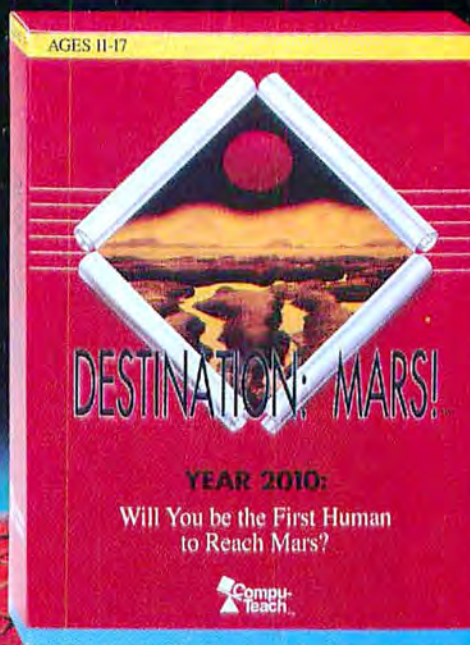
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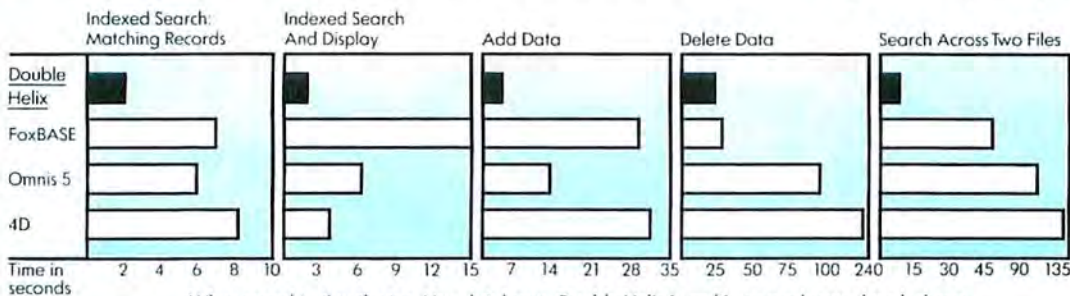


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Art Beat

Behind Macworld's Graphics

BY CATHY ABES

Artists: Jim Ludtke, Andrei Herasimchuk, John Cushwa.

Tools: Jim Ludtke: Mac IIx with 8MB of RAM and 50MHz DayStar Digital Accelerator; 300MB MicroNet external hard drive; MicroNet 45MB removable-cartridge drive; Swivel 3D Professional. Andrei Herasimchuk: Mac IIci with 8MB of RAM and 040/50 DayStar PowerCache board; 680MB Fujitsu external hard drive; Sigma ColorMax 8/24 color board; Infini-D 1.1; Adobe Photoshop 2.0. John Cushwa: Mac IIx with 20MB of RAM; a 173MB external hard drive; a Microtek MSF-300Z color scanner; a Wacom pressure-sensitive graphics tablet; Ray Dream Designer 1.1; JAG; Photoshop 2.0.

How It Was Done:

For this issue's feature article on 3-D modeling and rendering, "3-D: Structure, Surfaces, and Movement," 3-D animator and illustrator Jim Ludtke used Swivel 3D Professional to create a simple model—an oil lamp on a mantel in front of a framed mirror against a wall—that was then given to vendors of 3-D modeling and rendering packages to render. Each vendor chose an artist to render the scene; the results appear in the feature.

Along with the Swivel model, Ludtke provided a separate DXF file for each individual component of the scene, just in case anyone had trouble importing the Swivel file. Ludtke created the model with the intention of allowing the artists to use a variety of textures, both solid procedural and surface—such as glass, liquid, metal, wood, and marble—as well as ray tracing to create true reflections

and refractions. Two of those artists and the rendering processes they used are described in detail here.

Andrei Herasimchuk of Specular International (maker of Infini-D) began by importing the Swivel model into Infini-D and making screen shots (⌘-shift-3 in System 7) of the outlines for each object. He then used those PICT files as templates to re-create the model with Infini-D's lathe and extrusion

workshops. He re-modeled every object except the lamp base and the liquid oil, which were left as free-form (editable) objects. He then copied and pasted each model into a final scene, where he repositioned them to match the specifications of the original model. The process took four to five hours.

Herasimchuk began choosing surfaces, settling on texture maps for the walls, mantel, and mirror frame. For the walls, he used a 231K PICT file from Form and Function's Wraptures CD, tiling it (repeating it horizontally and vertically) to create a solid, single image that covered the entire wall surface. Whereas creating one large texture map might have required as much as 2MB of RAM to work with, tiling one small file required only as much as the size of the original file.

Next, Herasimchuk applied a high-res scan of D'pax's Salome Marble PICT texture map to the front and top of the mantel using Infini-D's Wrap texture mode. Because Infini-D can be used to compose surfaces by combining various texture maps and layers, he was able to



This image rendered in Infini-D by Andrei Herasimchuk (using a supplied model) was one of the images produced for our 3-D modeling and rendering feature.

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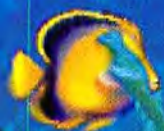
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Another image (rendered from the same model) created in Ray Dream Designer by Tom Cushwa.

assign the marble a 100 percent color map and a 30 percent reflection map to create subtle levels of reflection on the mantel where the darker shades appear. He next applied a mirror surface—a black texture set to 100 percent reflectiveness—to the mirror object. For the mirror's frame, he applied an oak texture map from the Wraptures CD.

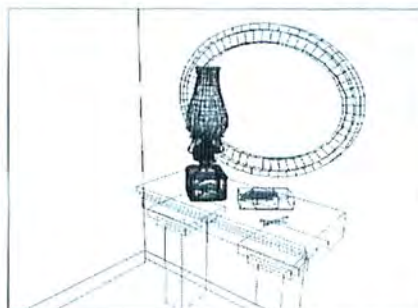
Rendering the lamp turned out to be the real challenge, because Herasimchuk wanted to approximate the feel of real glass while keeping the surface subtle enough to look photo-realistic. It could easily become too transparent or too bright. The amount and intensity of specular highlights and the refraction (the way light bends when it goes

through glass) also had to be just right. Using Infini-D's Rose Glass texture as a starting point, Herasimchuk lowered the amount of diffuse shading to make the glass look clear with a hint of red. To create refraction around the edges of the glass, he set the index of refraction to 1.1. He also made the glass 12 percent reflective so that the matchbox would be reflected in the lamp base. For the flame, he used a light-yellow point light.

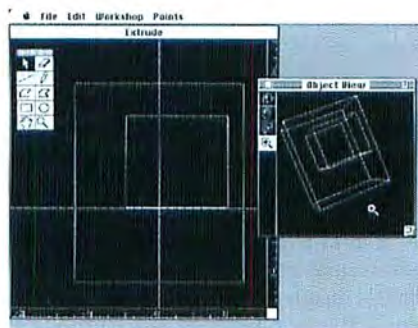
In Adobe Photoshop he created custom PICT maps for the top and side of the matchbox, which were then brought into Infini-D and applied to the model. He used procedural textures for the matches themselves: a light-brown noise and a red noise.

The final image was rendered at 1024 by 768 and took about 3½ days to render, at least double the normal rendering time. That was because Herasimchuk set the super-sampling (anti-aliasing) threshold to 2 percent instead of the default 20 percent and set the level of ray casting of reflections to 7 rays deep (instead of 3) and transparencies to 8 (instead of 5) to get the most realistic rendering. Using a 20MB virtual memory partition under System 7 also contributed to the slowdown. The final size of the image was 1.2MB.

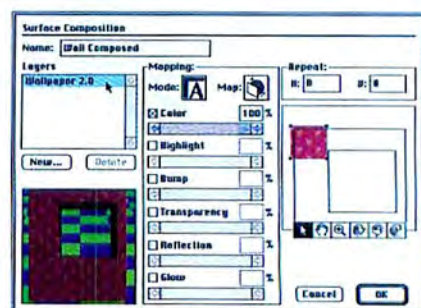
New York-based illustrator Tom Cushwa imported the original Swivel



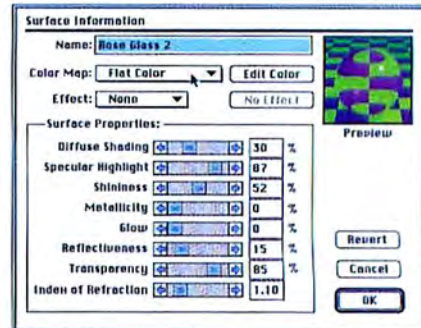
The original wireframe scene, modeled in Swivel 3-D Professional by Macworld artist Jim Ludtke, that was supplied to each of the vendors.



In Infini-D, Andrei Herasimchuk created the window that's reflected in the mirror, by punching a hole in the left wall that's out of the camera view.

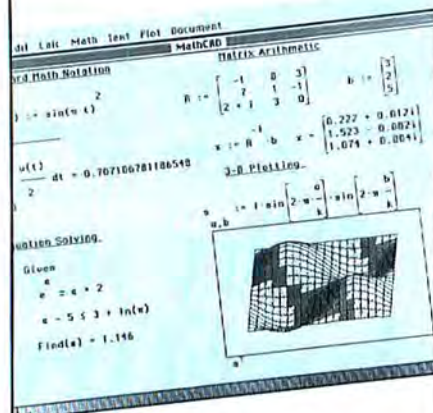


Herasimchuk created the wall texture by vertically and horizontally repeating, or tiling, one small PICT file in Infini-D.



Herasimchuk experimented with the surface properties of the glass lamp to find the right combination of attributes.

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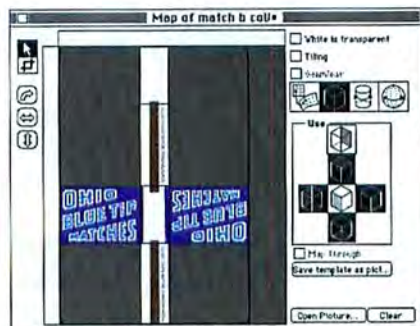
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Tom Cushwa used Ray Dream Designer's box texture mapping mode to build a template for the matchbox texture map he would design in Adobe Photoshop.

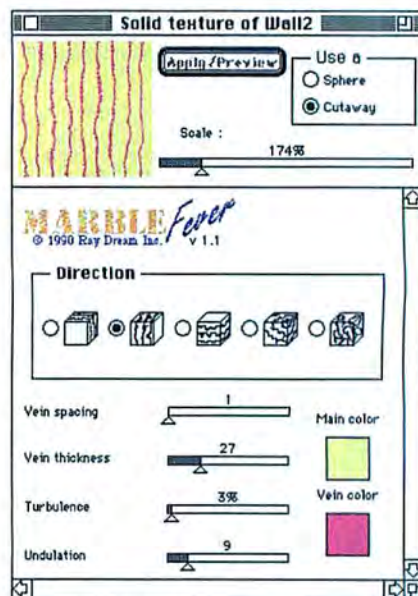
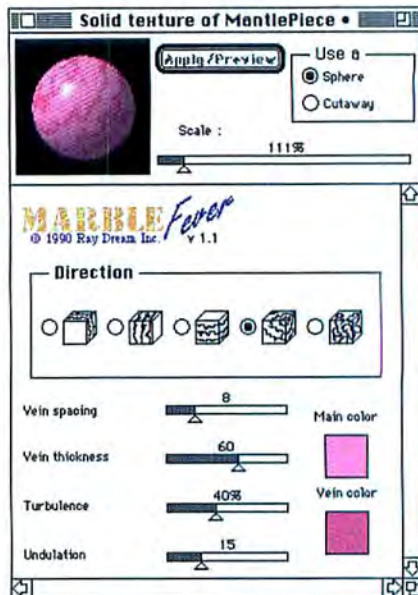
scene into Ray Dream Designer's SceneBuilder module. SceneBuilder automatically creates a separate file for each object, all of which can be opened in Ray Dream Designer's LightForge module. Because the Swivel model came in nearly intact, with everything positioned correctly, he had only to rebuild the mirror.

Cushwa opened up the box object in LightForge, where he did the only texture mapping in the image, for the matches and the matchbox. He used box texture mapping, which allowed him to save a template of the box he'd created. After bringing the template into Photoshop, Cushwa created a texture map by first scanning in an Ohio Blue Tip Matches box label, then creating the match strike in Photoshop and positioning it on the template so that it would map to the side of the box. He imported the map back into Ray Dream Designer and wrapped the map onto the surface of the box model. He created one match using the solid procedural wood texture and texture-mapped the red-and-white tip over the wood texture onto the match, then duplicated the match numerous times.

Cushwa made the mantel semi-reflective (16 percent) so that it would reflect the matchbox. He used the same solid procedural texture—marble—for both the mantel and the wallpaper, but with vastly different parameters so that he ended up with two totally different textures. He used the Woodworks solid texture for the mirror frame.

For the glass in the lamp, Cushwa set object parameters of 18 percent reflectiveness and 80 percent transparency, a light-blue color, and a small (5 percent), bright (72 percent) highlight with zero refraction. He made the mirror 100 percent reflective. For the oil in the lamp, he specified 90 percent transparency so the wick would show through.

The single light source is a white spotlight set at a 32-degree angle in the



Cushwa created two distinct textures—one for the mantel (top) and the other for the wall (bottom)—using the same marble solid texture but with different settings.

upper-right corner. He gave the light a falloff of 40 percent, so that it would gradually diminish into darkness, an effect particularly noticeable in the reflection on the mirror.

After rendering the final image, Cushwa ran the resulting PICT file through JAG, Ray Dream's antialiasing utility, to smooth out any jagged edges.

The entire modeling-and-rendering process took roughly 12 hours. Rendering time was approximately 3 hours. Most of the time involved doing ten separate test renderings at low resolution in order to fine-tune the parameters, mostly for the glass and positioning the lighting. The final file size was 1MB. **m**

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Full line and accessories available. All units listed below include a 1.4 Floppy Drive, a slip case & universal power supply.

- 4165 ⑦ Outbound Notebook 2000/240 (68000, 2 MB, 40 MB Hard Drive) ... 2599.
- 4167 ⑦ Outbound Notebook 2000/440 (68000, 4 MB, 40 MB Hard Drive) ... 2699.
- 4169 ⑦ Outbound Notebook 2030/440 (68ec030, 4 MB, 40 MB Hard Drive) ... 2999.
- 4170 ⑦ Outbound Notebook 2030/441 (same as 2030/440, incl. math copro) ... 3149.
- 4172 ⑦ Outbound Notebook 2030/460 (68ec030, 4 MB, 60 MB Hard Drive) ... 3399.



- ★ **Chipsoft & SoftStream ... 30 day MBG**
- 8279 ⑦ *MacInTax Personal Edition 1991 & HyperTax Tutor*—America's best selling tax software for the Mac with HyperTax Tutor, to answer your tax questions & teach you fundamental tax-saving strategies. Prepare your return the same way a tax expert would—without any extra hourly fees. MacInTax is the Editor's Choice of *MacUser* (2/89) & winner of the 1990 Macworld World Class Award. Selected state packages are also available. \$99.
- 8059 ⑦ *MacInTax Personal Edition 1991* 59.
- 8175 ⑦ *HyperTax Tutor* 49.
- ⑦ *MacInTax State Tax Packages* ... ea. 42.

- 4174 ⑦ Outbound Notebook 2030/461 (same as 2030/460, incl. math copro) . 3549.
- 4175 Extra 12V Battery . 59.
- 4177 Notebook Carrying Case . 79.

DAILY BUSINESS ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

- A Lasting Impression**
- ⑦ ResumExpert or Cover Letters. ea. 48.
- ⑦ ResumExpert Software Series. ea. 48.
- Abacus Concepts**
- 4482 ⑦ StatView SE+ Graphics 1.04 . 219.
- 4138 ⑦ StatView Student 1.0 . 75.
- 4481 ⑦ StatView II or 5840 ⑦ SuperANOVA . 309.
- ★ **Aclus ... 30 day MBG**
- 4024 ⑦ 4th Dimension 2.2 Runtime (4-user) . 249.
- 5618 ⑦ 4th Dimension 2.2 . 479.
- ★ **Advanced Software ... 30 day MBG**
- 5608 ⑦ DocuComp 1.5 . 89.
- Amaze, Inc.**
- 3582 ⑦ The Far Side Computer Calendar . 45.
- ★ **Avery ... 60 day MBG**
- 7446 ⑦ MacLabel Pro 1.5 . 48.
- ★ **Banner Blue ... 30 day MBG**
- 3548 ⑦ Org Plus Advanced 1.0 . 125.




Lotus Development

- 3606 ⑦ 1-2-3 for the Mac—Takes full advantage of the Mac. Directly manipulate & format all data, text, & graphics. Offers true 3D worksheets & Excel & 1-2-3 file compatibility \$349.
- 3604 ⑦ 1-2-3 Competitive Upgrade . 99.

- ★ **Baseline Publishing ... 30 day MBG**
- 8881 ⑦ Thunder 7 1.0.4 . 56.
- ★ **Beagle Bros. ... 30 day MBG**
- 3119 ⑦ BeagleWorks . 185.
- 3563 ⑦ BeagleWorks Upgrade . 95.
- ★ **Checkfree Corp. ... 30 day MBG**
- 6928 ⑦ Checkfree Mac 1.5 . 19.
- ★ **CheckMark Software ... 60 day MBG**
- 5862 ⑦ Payroll 4.5 . 175.
- 5863 ⑦ MultiLedger 2.0 . 235.
- 3767 ⑦ MultiLedger/MultiUser 2.0 . 359.
- ★ **Chipsoft ... 30 day MBG**
- 3849 ⑦ Short Form (for 1040A & 1040EZ filers) . 25.
- 8059 ⑦ MacInTax Personal Edition 1991 . 59.
- 8279 ⑦ MacInTax Personal Ed./HyperTax Tutor . 99.
- ⑦ MacInTax State Tax Packages . ea. 42.
- ★ **Claris ... 30 day MBG**
- 1129 ⑦ MacWrite II 1.1V2 . 136.
- 8216 ⑦ FileMaker Pro 1.0V2 . 209.
- 3531 ⑦ Claris Resolve 1.0 . 279.
- 1125 ⑦ MacProject II 2.5V1 . 349.
- 3903 ⑦ ClarisWorks 1.0 (special 'til 2/28/92) . 149.
- ★ **Dow Jones ... 30 day MBG**
- 5295 Dow Jones News Retrieval . 24.
- 1942 ⑦ Market Analyzer Plus 2.01 . 225.
- ★ **ElseWare Corp. ... 30 day MBG**
- 1506 ⑦ DataShaper 1.2 . 135.
- ★ **Essential Software ... 30 day MBG**
- 4086 ⑦ Easy Alarms 1.1 . 31.
- Fox Software**
- 5572 ⑦ FoxBASE +/Mac 2.01 . 289.
- ★ **Franklin Software ... 30 day MBG**
- 7070 Language Master 2.0 . 45.
- ★ **Good Software ... 30 day MBG**
- 2527 ⑦ REM's Property Manager . 339.
- ★ **Individual Software ... 30 day MBG**
- 9640 ⑦ Resume Maker 1.0 . 26.
- Informix**
- 4955 ⑦ Wingz 1.1A . 245.
- ★ **Intuit ... 30 day MBG**
- 2507 ⑦ Quicken 3.0 . 42.
- ★ **Kaetron Software ... 30 day MBG**
- 8941 ⑦ TopDown 3.0 . 199.
- Lotus Development**
- 3606 ⑦ 1-2-3 for the Mac . 349.
- 3604 ⑦ 1-2-3 Competitive Upgrade . 99.
- ★ **Mainstay ... 30 day MBG**
- 7718 ⑦ MacFlow 3.54 . 188.
- ★ **MECA ... 60 day MBG**
- 2796 ⑦ Managing Your Money 4.0 . 99.
- ★ **Microlytics ... 60 day MBG**
- 9729 Strunk & White's Elements of Style . 34.
- 7820 ⑦ Random House Encyclopedia 1.0 . 68.
- 7506 ⑦ Inside Information 1.0 . 68.

end of the week?



PANORAMA II

Easy enough to build your first database in minutes.
Powerful enough to run your business for years.

★Provue ... 60 day MBG
4582 ⑦ Panorama II 2.0.3—Designed with enough power for small businesses & enough convenience for novice users. Includes Clairvoyance & command key equivalents to the Find/Select dialog. Now faster than ever. \$245.

★Microsoft ... 30 day MBG

2572	⑦ Schedule Plus 1.0	129.
2884	⑦ Works 2.00E	159.
4902	⑦ Word 5.0 (Dec. '91)	299.
9803	⑦ Excel 3.0	309.
1420	⑦ Excel 3.0 Companion Book	20.
2565	⑦ Project 1.1	449.
5454	⑦ The Microsoft Office 1.5	479.

★New Era ... 30 day MBG

3130	⑦ nuBASE 1.3	179.
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★Niles & Associates ... 30 day MBG

5048	⑦ EndLink 1.13	58.
4602	⑦ EndNote 1.4	85.
8010	⑦ EndNote Plus 1.1	145.

★Nolo Press ... 30 day MBG

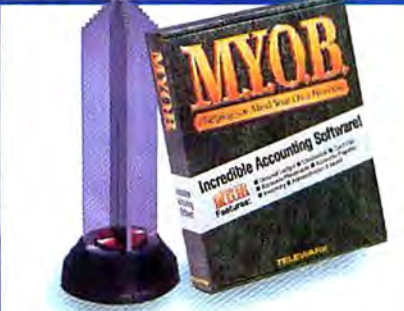
4228	⑦ For the Record 2.0	30.
2981	⑦ WillMaker 4.0 (not valid in LA.)	35.

★Odesta ... 30 day MBG

5621	⑦ Double Helix 3.5	429.
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★Paragon Concepts

5683	⑦ Nisus 3.06	245.
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MYOB

Incredible Accounting Software

★Teleware ... 30 day MBG
7616 ⑦ M.Y.O.B. 2.1—Incredible, easy-to-use, accounting software for small- to medium-sized businesses. Features include fully integrated A/P, A/R, General Ledger, Inventory, Checkbook and Card File. System 7-savvy \$139.

★Portfolio Systems ... 30 day MBG

7992	⑦ DynoPage or 6916 ⑦ Dynodex	ea. \$72.
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★PowerUp ... 30 day MBG

7696	⑦ Calendar Creator 1.01	44.
7694	⑦ Address Book Plus 2.0	63.
7698	⑦ Fast Forms 2.0	112.

★Provue ... 60 day MBG

4582	⑦ Panorama II 2.0.3	245.
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★Que Corp. ... 30 day MBG

7482	⑦ RightWriter for the Mac 3.1	54.
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★Reality Technologies ... 30 day MBG

6929	⑦ WealthBuilder 1.02	95.
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★Reference Software ... 30 day MBG

6268	⑦ Grammatik Mac 2.0	58.
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★Round Lake Publishing

9946	⑦ LetterWorks, 9945 ⑦ LetterWorks Sales 1.0, or 9947 ⑦ LetterWorks Legal 1.0	ea. 45.
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★Shana ... 30 day MBG

8810	⑦ Informed Manager 1.2	99.
7692	⑦ Informed Designer 1.2	159.

★SoftStream ... 30 day MBG

8175	⑦ HyperTax Tutor	49.
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★Softsync, Inc. ... 30 day MBG

7129	⑦ Accountant, Inc. 2.1.2	339.
3828	⑦ Accountant, Inc./Multi-User 1.0	739.

★Software Toolworks

8366	⑦ Dollars & Sense 5.0	59.
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★Spyglass ... 60 day MBG

2033	⑦ Format 1.01	159.
2027	⑦ Transform 2.0 or 2028 ⑦ Dicer 1.1	ea. 399.

★Survivor Software ... 30 day MBG

3289	⑦ MacMoney 3.52	59.
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★Symantec ... 30 day MBG

2237	⑦ GreatWorks	199.
3422	⑦ More 3.1	265.

★Symmetry ... 30 day MBG

3131	⑦ Acta 7	75.
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★Synergy ... 30 day MBG

6617	⑦ KaleidaGraph 2.1.3	150.
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★Teleware ... 30 day MBG

7616	⑦ M.Y.O.B. 2.1	139.
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★TIMESLIPS ... 30 day MBG

2986	⑦ Timeslips III 2.0H	194.
8939	⑦ Accounting Link 1.0B	52.

★T/Maker ... 30 day MBG

3639	⑦ WriteNow 3.0 (Feb. '92)	155.
3508	⑦ The PowerBundle (with carry case)	159.

★Williams & MacIsa ... 30 day MBG

4976	⑦ StickyBusiness 1.5	51.
6926	⑦ myDiskLabeler III 3.1	42.

★WordPerfect ... 60 day MBG

3800	⑦ WordPerfect Mac 2.03	279.
9865	⑦ (5 pack) 1195. 9866 ⑦ (20 pack)	3599.
3090	⑦ WordPerfect Office 3.0 (single)	89.
3092	⑦ WP Office (5 pack) 295. 3088 (20 pack)	895.

★Wordstar ... 30 day MBG

3554	⑦ American Heritage Dictionary	55.
6984	⑦ Correct Grammar 2.0	59.

★Wyoming Software ... 30 day MBG

3557	⑦ Business Plan Toolkit 4.0	95.
3555	⑦ Business Sense 1.4.1	125.


GRAPHICS & DESIGN PUBLISHING, PRESENTATIONS

★Abracadata, Ltd. ... 30 day MBG

9995	⑦ Instant Decorator 1.1	29.
9990	⑦ Design Your Home - Architecture, 9992 Interiors, or 9994 Landscape	ea. 63.

★Adobe Systems

	⑦ Adobe Type Library (Vol. 1-230)	call
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Adobe Premiere

Adobe Systems
4145 ⑦ Adobe Premiere 1.0—Easily combines video footage, audio recordings, animation, still images and graphics to create high-quality digital movies. Takes advantage of Apple's QuickTime media-integration technology \$309.


8794	⑦ Adobe Type On Call	47.
6957	⑦ Adobe Type Reunion 1.02	41.
5750	⑦ Adobe Type Manager 2.0	59.
6053	⑦ Adobe Plus Pack 2.0	118.
6156	⑦ Adobe Plus Pack/ATM	174.
6098	⑦ TypeAlign for ATM 1.0.4	62.
6671	⑦ Adobe Type Set 1 or 6677 ⑦ Set 2	62.
7587	⑦ Adobe Type Set 3	125.

Adobe Type Sets for Business:

2221	⑦ Letters, Memos & Faxes	95.
2223	⑦ Invitations & Awards	95.
2219	⑦ Spreadsheets & Graphs	95.
2222	⑦ Overheads & Slides	95.
8171	⑦ Adobe Illustrator 3.2 (with ATM)	369.
6644	⑦ Adobe Photoshop 2.0	549.
5001	⑦ Streamline 2.0	122.
4145	⑦ Adobe Premiere 1.0	309.

★Aldus ... 30 day MBG

2461	⑦ Aldus Gallery Effects 1.0	129.
3506	⑦ Aldus SuperPaint 3.0	133.
6674	⑦ Aldus Personal Press 1.01	195.



DESIGN YOUR OWN HOME Architecture

★Abracadata, Ltd. ... 30 day MBG
9990 ⑦ Design Your Own Home-Architecture—Modify or design the home of your dreams! Includes a library of architectural objects and sample floor plans. Everything you need to create professional drawings or a simple sketch . \$63.

We have just the



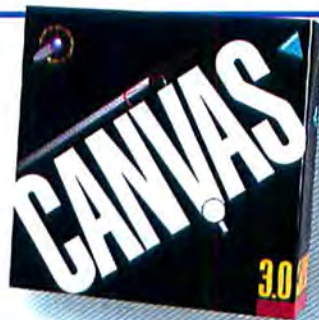
★ **Expert Software ... 30 day MBG**
 4870 **Expert Color Paint 1.0**—New! The latest in painting tools at an incredible price. You get hot 32-bit color, image editing, and tools that may be customized, anti-aliasing, virtual memory and System 7 support ... \$29.

3980	⑦ Aldus Digital Darkroom 2.0	259.
3507	⑦ Aldus Super 3D 2.5	325.
7467	⑦ Aldus PrePrint 1.5	325.
4751	⑦ Aldus Persuasion 2.0	325.
1330	⑦ Aldus FreeHand 3.1 (Dec. '91)	395.
7088	⑦ Aldus PageMaker 4.2 (Dec. '91)	495.
8054	⑦ Aldus Design Team (best buy, includes PageMaker, FreeHand & PrePrint)	859.
Altays		
9806	⑦ Metamorphosis Pro 2.01	89.
1983	⑦ EPS Exchange 1.0	89.
1195	⑦ Fontographer 3.3	265.
★ Ares Software ... 30 day MBG		
8878	⑦ FontMonger 1.05	62.
★ Baseline Publishing ... 30 day MBG		
8055	⑦ Screenshot 1.2	34.
7784	⑦ Color MacCheese 2.0.8	56.
7828	⑦ Exposure Pro 1.0.2	78.
Bitstream		
9428	⑦ True Type Fonts 1 or 9429 Fonts 2	ea. 59.
1591	⑦ True Type Fonts 3 or 1595 Fonts 4	ea. 98.
Broderbund Software		
3572	⑦ Kid Pix 1.2	34.
1427	⑦ The Print Shop 1.3.2	35.
6281	⑦ TypeStyler 2.0 (with ATM, Dec. '91)	127.
★ Casady & Greene ... 30 day MBG		
8879	⑦ Fluent Font Library 4.05	99.
1945	⑦ True Type Starter Set	57.



★ **SoftSync, Inc. ... 30 day MBG**
 7129 **Accountant, Inc. 2.1.2**—Comprehensive, fully-integrated accounting software that includes General Ledger, Receivables, Payables, Inventory, Invoicing, Payroll, Check Writing & more \$339.
 3828 **Accountant, Inc./MultiUser 1.0** ... 739.

★ Claris ... 30 day MBG		
1123	⑦ MacPaint II 2.0	\$88.
2518	⑦ MacDraw Pro 1.0	279.
8007	⑦ Claris CAD 2.0	629.
Custom Applications		
8037	⑦ Freedom of Press Light 3.01 (17 fonts)	55.
★ DeltaPoint ... 60 day MBG		
3558	⑦ DeltaGraph Pro (Dec. '91)	209.
★ Deneba Software ... 30 day MBG		
3227	⑦ Canvas 3.0	249.
★ Expert Software ... 30 day MBG		
4870	⑦ Expert Color Paint 1.0	29.
★ Foundation Publishing ... 60 day MBG		
6728	⑦ Comic Strip Factory 1.6	36.
IDD/Innovative Data Design		
2417	⑦ MacDraft 2.1	279.
4707	⑦ Dreams 1.10	special 349.
★ Letraset ... 30 day MBG		
2619	⑦ ImageStudio 1.5	139.
4709	⑦ LetraStudio 2.0 (Dec. '91)	139.
2621	⑦ Ready Set Go! 4.5A	165.
6300	⑦ FontStudio 2.0	359.
6302	⑦ DesignStudio 2.0	489.
6301	⑦ ColorStudio 1.5	599.
★ Lingulist's Software ... 60 day MBG		
Over 100 language fonts		
2636	MacKanji 6.0	call
2638	LaserCyrillic 1.0	79.



★ **Deneba Software ... 30 day MBG**
 3227 **Canvas 3.0**—Award-winning precision drawing program featuring Bezier font outlines, professional word-processor-like text capabilities, object blending, a freehand Bezier curve tool, Smart Mouse drawing aid, and more ... \$249.

★ MacroMind•Paracomp ... 30 day MBG		
3148	⑦ Magic 1.0 (Dec. '91)	279.
5028	⑦ ModelShop 2.0	599.
	⑦ SwivelArt (Map & Viewpoint art)	ea. 89.
7441	⑦ Swivel 3D Professional 2.0	435.
3450	⑦ SwivelMan 1.0	599.
3440	⑦ QuickPICS 1.0	99.
★ Mainstay ... 30 day MBG		
9798	⑦ Capture 4.0	82.
★ MicroFrontier ... 30 day MBG		
3013	⑦ Color III 1.0	75.
7886	⑦ Enhance 2.0	235.
★ MicroMaps ... 30 day MBG		
7556	⑦ MapArt (PICT) or 7555 (EPS)	ea. 89.
★ Microsoft ... 30 day MBG		
2878	⑦ PowerPoint 2.01E	245.
★ Monotype Typography ... 30 day MBG		
	⑦ Monotype Imprints-TrueType	ea. 22.
	Classic Fonts (full line available)	call
Postcraft International		
2210	⑦ Effects Specialist 1.04	95.
	⑦ Layouts for PageMaker, ReadySetGo, & QuarkXPress	ea. 69.
	⑦ Layouts: Stationery or Flyers	ea. 45.
Quark		
7612	⑦ QuarkXPress 3.1 (Dec. '91)	569.



★ **Specular International ... 30 day MBG**
 4962 **Infini-D 1.1**—An integrated 3D modeling, 32-bit rendering, & 3D animation package. A powerful 3D environment to create images and present ideas. Features: anti-aliasing, shadowing, 3D texture mapping, noise, & shading. \$649.

★ Specular International ... 30 day MBG		
4962	⑦ Infini-D 1.1	649.
★ Splnnaker ... 30 day MBG		
3530	⑦ Certificate Maker 2.02	22.
Strata		
7773	⑦ StrataVision 3D 2.0	629.
★ SuperMac Tech. ... 60 day MBG		
3380	⑦ PixelPaint 2.1	149.
	⑦ Pro	5625
	⑦ Pro	459.
3G Graphics		
3942	⑦ Images with Impact: Graphics 1	49.
4583	⑦ Business 1	64.
6379	⑦ Accents & Borders I	64.
★ Timeworks ... 30 day MBG		
7115	⑦ Publish It! Easy 2.12 with File-It!	154.
★ T/Maker ... 30 day MBG		
Full line available.		
	⑦ ClickArt (bitmapped)	ea. 32.
	⑦ ClickArt (EPS format)	ea. 82.
1292	⑦ Color Graphics Presentation 1.0	109.
Virtus Corporation ... 30 day MBG		
4488	⑦ WalkThrough 1.03	249.
★ Visual Business Sys. ... 30 day MBG		
9867	⑦ GraphMaster 1.1	189.
★ Zedcor ... 60 day MBG		
3986	⑦ DeskPaint & DeskDraw 3.0.7	113.

PROGRAMMING UTILITIES, HYPERCARD, SECURITY

★ Abbott Systems ... 30 day MBG		
2515	⑦ Calc+ 1.0	39.
5236	⑦ CanOpener 2.0	62.
★ Advanced Software ... 30 day MBG		
8051	⑦ Intouch 1.1	39.
2808	⑦ QuickTools 1.0	45.
After Hours Software		
1352	⑦ TouchBASE 2.0	79.
★ Aladdin Systems ... 30 day MBG		
6169	⑦ Shortcut 1.5	45.
6740	⑦ StuffIt Deluxe 3.0 (Jan. '92)	62.
★ Aldus ... 30 day MBG		
5100	⑦ Aldus SuperCard 1.6 (Dec. '91)	195.
★ ALSoft ... 30 day MBG		
9808	⑦ MasterJuggler 1.57	25.
9807	⑦ DiskExpress II 2.07	49.
9886	⑦ MultiDisk 1.27	49.
★ Alysis Software ... 30 day MBG		
2687	⑦ SuperDisk! 2.0	49.
Apple Computer		
1074	⑦ System 7 (with free PCTV video)	99.
★ ASD Software ... 30 day MBG		
9440	⑦ MaccessCard Reader (reqs. FileGuard)	299.
9439	⑦ MaccessCard/FileGuard (1) Bundle	399.

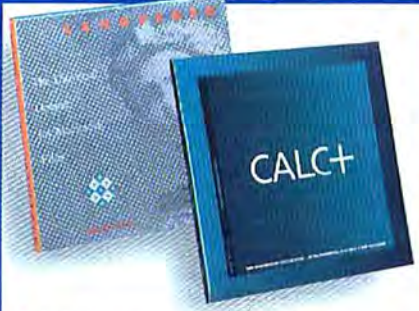
service you seek.



★ ASD Software ... 30 day MBG
 MacAccessCard Reader combined with FileGuard 2.7 secures your Mac against unauthorized users.
 7085 **FileGuard 2.7 (1 user)**... \$139.
 9440 **MacAccessCard Reader (reqs. FileGuard)**... 299.
 9439 **MacAccessCard/FileGuard (1) Bundle**... 399.

7085	FileGuard 2.7 (1 user) (Dec. '91)	139.
7422	(5 user) ... 489. 7423 (10 user) ... 799.	
★ Baseline Publishing ... 30 day MBG		
7783	INIT Manager 1.1	34.
3114	INIT Info	39.
★ Berkeley Systems ... 30 day MBG		
5737	After Dark 2.0V	28.
2198	More After Dark (M.A.D.)	23.
2196	After Dark & M.A.D. Bundle	42.
1541	Stepping Out II 2.02	49.
Bright Star Technology		
2614	At Your Service 1.0	30.
3994	Catalog of Actors (six)	55.
★ Casady & Greene ... 30 day MBG		
2269	QuickDEX 2.3 ... 22. 2528 (5 Pak)	99.
4485	Crash Barrier 1.0	45.
★ CE Software ... 60 day MBG		
1727	CalendarMaker 3.0.1	31.
6278	DiskTop 4.01 or 3376 Tiles 1.0	ea. 63.
7518	Alarming Events 1.03	84.
8024	QuickKeys 2.1	94.
★ Central Point ... 30 day MBG		
5041	Mac Tools Deluxe 1.2	79.
★ Claris ... 30 day MBG		
8734	HyperCard Development Kit 2.1	139.
★ Connectix ... 30 day MBG		
7830	Maxima 2.0.1	45.
6647	HandOff II 2.2.1	56.
★ Cyan ... 30 day MBG		
2715	Peacock 2.0 (for HyperCard)	43.
★ Dantz Development ... 30 day MBG		
5255	Retrospect 1.3	147.
7945	Retrospect Remote 1.3	264.
7946	Remote (10 Pak) ... 147. 3112 (50 Pak)	649.
3393	DiskFit Pro 1.0	74.
Dubl-Click Software		
7974	ClickChange 1.05.2	56.
1824	Calculator Construction Kit 2.09.6	62.
★ ElseWare Corp. ... 30 day MBG		
1507	Bar Code Kit 1.0d	135.
4871	Checklist 2.0	135.
★ Fifth Generation ... 30 day MBG		
4287	PYRO! 4.01	25.
3955	Suitcase II 1.2.11	53.
8286	SuperLaserSpool 2.02	100.
5178	FastBack Plus or 5725 DiskLock	ea. 127.

★ Go Technology ... 60 day MBG		
2966	Hot Keys System 7.0 Finder	\$21.
★ ICOM Simulations ... 30 day MBG		
3731	OnCue II 2.0	56.
★ Insight Development ... 30 day MBG		
6171	MacPrint 1.23	93.
1296	Mosaic 1.0 (3 user)	249.
★ JAM Software USA ... 30 day MBG		
6089	Smart Alarms with Appt. Diary 3.0.7	63.
★ Kensington ... 30 day MBG		
9301	PassProof (right) or 9300 (left)	ea. 65.
2011	PassProof Classic or 1632 IIs	ea. 65.
★ Kent Marsh Ltd. ... 30 day MBG		
9513	FolderBolt 1.02	73.
2591	The NightWatch 1.03	84.
9779	GuardCard SE or 9951 SE/30	ea. 106.
★ Kiwi Software ... 60 day MBG		
6267	Kiwi ENVELOPES! 3.1.3	32.
3518	Kiwi POWER WINDOWS	50.
★ Magic Software ... 30 day MBG		
7268	POWERIcons or 7267 AutoSave II	ea. 26.
7270	Backmatic 2.01	50.
★ Microcom ... 30 day MBG		
8562	Complete Undelete 1.1	48.
4803	Virex 3.5	57.
8561	911 Utilities or 2462 Citadel w/Shredder	89.



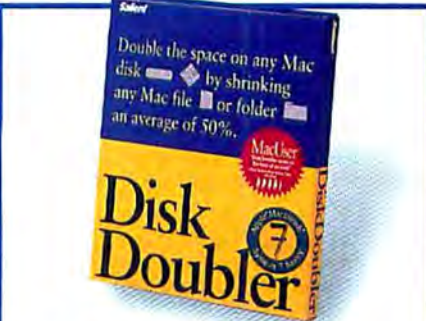
★ Abbott Systems ... 30 day MBG
 5236 **CanOpener 2.0**—Universal file opener.
 Browse & copy any file, even damaged ones! \$62.
 2515 **Calc+ 1.0**—Professional replacement for Apple's calculator. Large display, paper tape printout, % key, DTP calculations... 39.

MicroMat Computer Systems		
2810	MacEKG 1.0.9	63.
★ Microseeds Pub. ... 60 day MBG		
7068	INITPicker 2.02	34.
2913	Redux, 7116 Rival or 2936 HAM	ea. 49.
★ Microsoft ... 30 day MBG		
4471	QuickBasic 1.0	64.
★ Nine to Five Software ... 30 day MBG		
9767	Reports 2.1	94.
★ Now Software ... 30 day MBG		
6925	Now Utilities 3.1	84.
★ ON Technology ... 1 year MBG		
6385	On Location 2.0 (Dec. '91)	75.
9801	Meeting Maker (5) ... 309. 9800 (10)	549.
2570	Instant Update (2) ... 309. 2571 (5)	619.
★ Palomar Software ... 30 day MBG		
8210	PLOTTERgeist 2.0	249.
★ Sallent Software ... 30 day MBG		
7404	DiskDoubler 3.7	49.
4838	AutoDoubler 1.0	49.



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 8561 **911 Utilities 1.0**... \$89.
 4803 **Virex 3.5**... 57.
 2462 **Citadel with Shredder 1.0**... 89.
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3448	SmartScrap & The Clipper 2.1	56.
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5176	Symantec AntiVirus for Mac (SAM)	66.
5724	Symantec Utilities for Mac (SUM II)	96.
6748	Norton Utilities for the Mac 1.1	87.
3598	Norton Utilities & SAM Bundle	118.
3421	THINK Pascal 165. 2688 THINK C	199.
9957	THINK Reference 1.0	69.
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8964	MasterFinder 1.2	49.
★ TGS Systems ... 60 day MBG		
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★ Thought I Could ... 30 day MBG		
4843	Wallpaper 1.0	34.
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3889	Lifeguard 1.0.2 or 4845 MindSet 1.0	35.
3888	Synchronicity 3.0	35.
3887	First Things First 1.0.2	41.
★ Wolfram Research ... 30 day MBG		
8273	Mathematica Enhanced 2.0	789.



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 7404 **DiskDoubler 3.7**—Because no disk is big enough, this latest System 7 Savvy version provides smaller compressed files, increased speed, simplified file backups, & self-expanding files.
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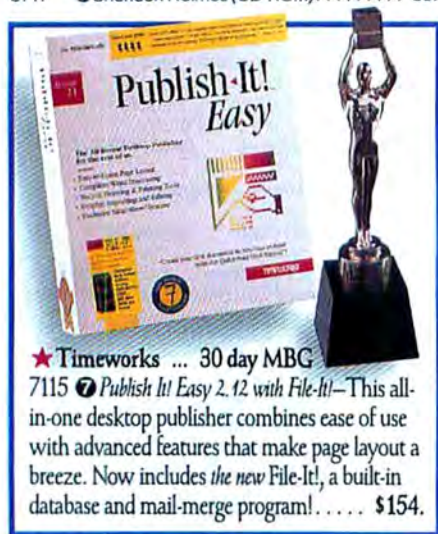
- Adobe Systems**
 8794 ⑦ Adobe Type On Call CD/ATM \$47.
CD Technology
 2321 CD-ROM Caddy 11. 2533 (5) 49.
 8057 Porta Drive CD-ROM 599.
 4140 ⑦ Multimedia HANDisc (Dec. '91) 75.
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***Discovery Systems ... 60 day MBG**
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 9965 ⑦ Sherlock Holmes (CD-ROM) 26.
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Dubl-Click
 9944 The WetSet CD (approx. 7000 images) 218.
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 7771 ⑦ Webster's Dictionary (CD-ROM) 159.
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Passport Designs
 8253 ⑦ TRAX 2.2 57.
 9442 ⑦ Audio TRAX 1.0 209.
 3117 ⑦ Master Tracks PRO 4 4.5 315.
 8250 ⑦ Encore 2.07 379.
 3115 ⑦ MIDI Interface 79.



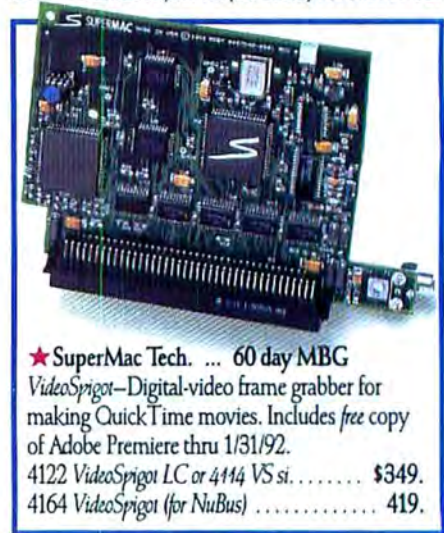
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 9441 CDR36 CD-ROM Portable Drive 399.
 2595 General Reference CD-ROM Bundle (includes CDR36, kit & 7 titles) 529.
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 8607 ⑦ Music Production Kit CD 1199.
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 2611 ⑦ Vocabulearn/ce 2.0 Spanish 1 CD 69.
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Pixar
 3566 ⑦ Showplace/RenderMan CD 449.
Software Toolworks
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 9784 RasterOps 24SI 649. 8944 24STV 1249.
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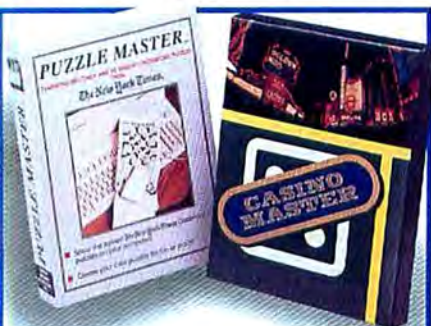
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 1423 Hard Ball II or 8217 Ishido ea. 31.
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 9804 ⑦ RoboSport or 8195 ⑦ BannerMania ea. 35.
 3562 ⑦ Patton Strikes Back 35.
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 8266 ⑦ SimEarth 1.0 40.
 4966 SimCity (CP) 29. 5871 ⑦ Supreme 47.

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 4960 **Fun Bundle (includes Crystal Quest w/CE, Sky Shadow & Mission Starlight)** 59.
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 8525 **Casino Master (B&W) 41. 8524 (Color)** 45.
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 6128 **MathBlaster Mystery** 29.
 2574 **MathBlaster Plus** 35.
 8278 **Alge-Blaster Plus** 35.
 3923 **Personal Trainer SAT** 35.
 ★ **Deadly Games ... 30 day MBG**
 2811 **Bomber 2.22** 31.
 3460 **Battle of Britain II (Dec. '91)** 31.



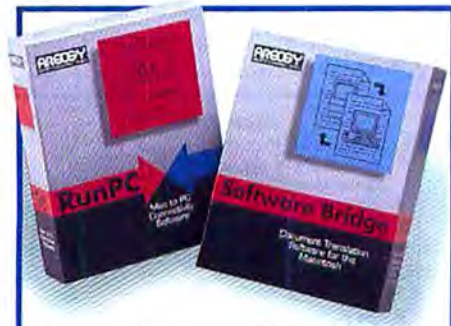
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 8050 **EARTHQUEST 2.0** 39.
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 6716 **Pipe Dream 1.2** 17.
 1303 **Loom 1.0** 29.
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 8643 **Harpoon** 39.
 1907 **PGA Golf or 2963 Starlight II 1.0** ea. 39.
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 1555 **oids 1.0** 25.
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 4334 **NumberMaze** ... 25. 8527 **(Color)** ... 35.
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 3414 **Mutant Beach (Dec. '91)** 44.
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 1894 **BattleChess (3D animation)** 29.
 3520 **Dvorak on Typing (Dec. '91)** 29.
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 3534 **Castles 1.0 (Feb. '92)** 34.
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 3281 **The Writing Center 1.0** 51.
 ★ **Leister Productions ... 30 day MBG**
 7126 **Reunion 3.0** 115.
Mallard Software
Scenery Disks 1-4 Flight Simulator ea. 30.
 ★ **MECC ... 30 day MBG**
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 8258 **Turbo Math Facts 1.1** 25.
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 2716 **Word Search Deluxe 1.0** 35.
 8260 **Word Quest 1.0** 30.
 4087 **Christmas Pack 1.0** 30.
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PageMaker 4.0 (modules 1-6) ea. 62.
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Works 2.0 (modules 1-4) ea. 62.
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 Hoyle's Book of Games II 20.
 9733 **Space Quest III or 2522 IV** ea. 34.
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- 4073 Colour Billiards 38.
3501 7 Classic Trilogy (Cribbage, Whist, Hearts) 50.
3472 7 Family Cards (Solitaire, Rummy, War) ... 50.

Software Toolworks

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1908 7 World Atlas 1.0 52.

★Spectrum Holobyte ... 30 day MBG

- 8180 7 Faces 1.0 14.
3464 7 Tetris 1.3 or 6112 7 Welltris 1.1 ea. 22.
3017 7 Wordtris 1.0 (Jan. '92) 25.
3459 7 Falcon 2.2.1 or 8181 7 Vette 1.0 ea. 33.

★Spinnaker ... 30 day MBG

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★Strategic Studies ... 30 day MBG

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2685 7 American Civil War 1.0 29.
3287 7 Warlords (empires at war) 31.

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8098 7 LSAT Prep for the Mac 3.7 35.

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- 8192 7 Mum's The Word 1.1A (gardening) 79.
9970 7 Mum's The Word Plus 1.01 (color) 107.



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- 2198 7 More After Dark (M.A.D.)—25 new displays for After Dark. Featuring Mowin' Man, Tunnel, Crazy Kittens, Art Museum \$23.
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2196 7 After Dark & M.A.D. Bundle 42.

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- 7836 7 Nemesis Go Junior 5.0 19.
1993 7 Nemesis Scribbler 5.0 29.
7624 7 Nemesis Go Master 5.0 35.
2471 7 Nemesis Deluxe Toolkit 5.0 69.

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3815 NFL Challenge 1.03 55.

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- 6266 InterFax 24/96 Modem 289.
2724 InterFax 24/96 with InterShare 339.

★Applied Engineering ... 30 day MBG

- 8362 7 QuadraLink (with AE Shadow) 205.

★Argosy Software ... 30 day MBG

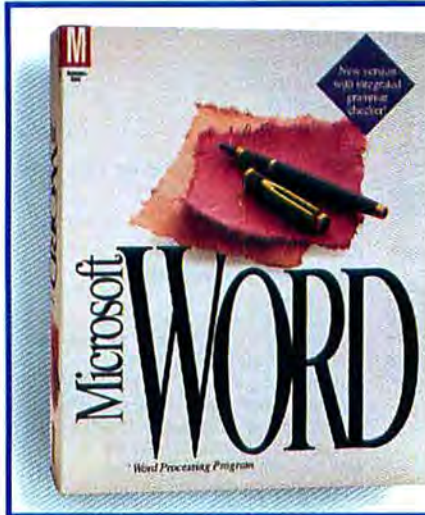
- 7872 7 Software Bridge/Mac 2.0.1 99.
2447 7 RunPC/Remote 139.
2448 7 RunPC/Network 279.

★CE Software ... 60 day MBG

- 8066 7 QuickMail 2.5 (5) 249. 8067 (10) 375.

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- 1676 7 Macintosh Membership Kit 1.5 25.



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- 1673 7 CompuServe Navigator 3.04 49.
1674 7 Membership Kit/Navigator Bundle 72.

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- 1823 7 MacLink Plus/PC 6.0 129.
4842 7 MacLink Plus/Translators 6.0 109.

★Dayna ... 60 day MBG

- DaynaPORT E: (10BASE-T) ea. 209.
DaynaPORT E: SE, SE/30, II, IISI, LC 229.
8719 EtherPrint or 9888 (10BASE-T) ea. 349.

Dove Computer

- 6758 7 DoveFax 2.0 269. 3352 NuBus 329.
9634 7 DoveFax Plus 349. 4111 NuBus 399.
4110 7 DoveFax LAN 499. 4109 NuBus 529.

★Farallon Computing ... 30 day MBG

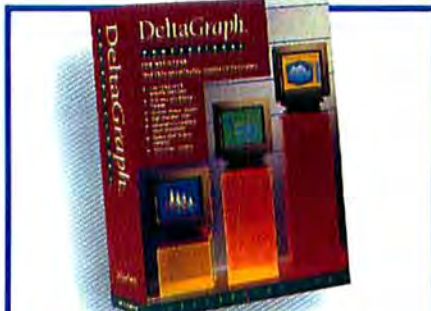
- Full line available. Partial listing.
9805 7 Timbuktu 4.0.2 135.
4866 7 Timbuktu/Remote 3.0 135.
9961 PhoneNET Card PC 209.
6273 PhoneNET StarConnector 10-Pack 129.
4869 PhoneNET Connector 10-Pk (DIN8) 198.
2206 PhoneNET StarController 300 899.
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4814 PhoneNET StarController 377 1299.

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- 6115 7 White Knight 11 85.

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- 2300 7 Smartcom II for the Mac 3.3 84.
8614 Personal Modem 2400 Plus 149.
3522 OPTIMA 96 (w/free Smartcom EZ) 479.
7391 ULTRA 96 Modem 669.

Insignia Solutions

- 7557 7 Access PC 1.1 60.
9726 7 Entry Level SoftPC 2.5 125.
4089 7 Universal SoftPC 2.5 195.
3229 7 SoftAT 2.5 295.
3441 7 SoftNode 1.0 105. 3454 (10 Pak) 695.

Intel Corporation

- 5119 2400EX Modem 169. 6420 (MNP) 225.

★Microcom ... 30 day MBG

- 7459 7 Carbon Copy Mac 2.0 (single) 59.
1556 7 Carbon Copy Mac 2.0 (unlimited) 179.
8027 MacModem V.32 689.

★Nuvotech ... 60 day MBG

- 3000 TurboNet ST (DIN8) 29. 6751 (12 Pak) 279.

★Orange Micro ... 30 day MBG

- 2394 7 Orange386 (16 MHz) 1549.
2392 7 Orange386 (20 MHz) 1799.

★Practical Peripherals ... 30 day MBG

- 8994 2400 V.42 bis Modem 199.
7934 PM9600SA Modem 1.26 465.
9849 7 SmartPack 9600 (with Smartcom II) 525.

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3832 7 ProModem Remote Plus 245.
3232 7 ProModem 24/96 S/R Minifax Plus 265.
8990 7 ProModem Ultima 689.
3831 7 ProModem 9600M-EC 495.

PSI Integration, Inc.

- 3143 COMstation 1 285. 3142 COM 2 375.

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- 3444 7 NetSerial 1.35 275.
4347 NetBridge or 4942 7 TeleBridge 405.

Sitka/TOPS

- 4188 Teleconnector (DIN8) 23. 2230 (10) 189.
6264 7 TOPS Network 3.1 187.

★Software Ventures ... 30 day MBG

- 3455 7 MicroPhone II 4.0 (Dec. '91) 215.

★Synergy ... 30 day MBG

- 6618 7 VersaTerm 4.6 90. 6619 PRO 3.6 177.

★Tactic Software ... 30 day MBG

- 2996 7 Traffic Controller Personal 1.0 65.

★Technology Works ... 30 day MBG

- 1582 7 GraceLAN 295. 1584 Corporate 715.
1583 7 GraceLAN 50 Node Upgrade 115.

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3535 7 Mac 240 139. 3541 7 Mac 241 195.
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 ⑦ FX9624 Send/receive Fax/Modem ... 119.
 ⑦ FX9624V Send/receive Fax/Modem ... 169.
 ⑦ V.42bis Modem (with MacPack) ... 139.
 ⑦ V.32 Turbo Modem (with MacPack) ... 419.

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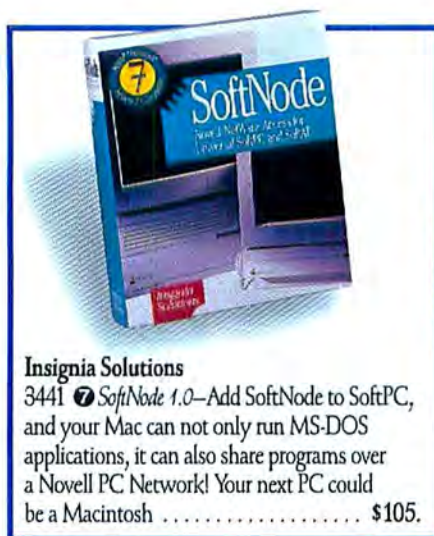
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Bravo Communications
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GDT Softworks
 ⑦ BetterWriters 1.0 (software drivers) ... 39.
 ⑦ PrintLink Collection/Serial 4.0.1 ... 59.
 ⑦ PrintLink Collection/Parallel 4.0.1 ... 139.
 ⑦ JetLink Express/Serial 2.1 ... 89.
Hewlett-Packard
 HP B&W DeskWriter (w/cartridge) ... 479.
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 Rival Monochrome Systems ... ea. 1199.
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 3036 ⑦ Grappler 2.0 ... 92. 6229 ⑦ LX ... 111.



★ Mouse Systems ... 30 day MBG

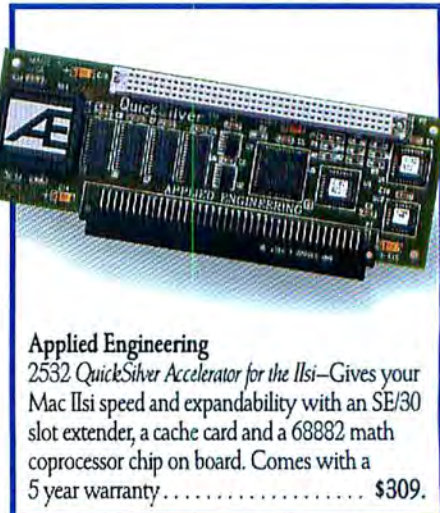
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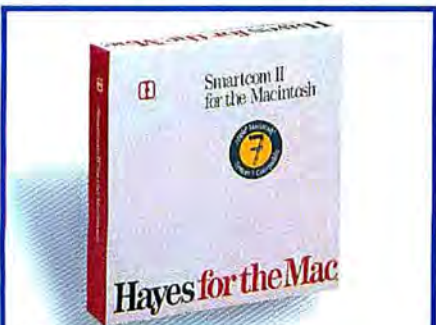
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1505 Oak Disk Case (36) ... 21. 4623 (90) ... 32.

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2694 Moustrak Pad (7"x9") ... 8. 2692 (9"x11") ... 9.
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Have We Got a Dealer for You

BY STEVEN LEVY

FOURTEEN YEARS AGO WE WERE the little guys on the block," reads a prominent ad in the *New York Times* by a dealer called Computer Era. "Today we're #1 in Macintosh sales in the Nation. Well, we got there by MAKING FRIENDS AND MAKING IT RIGHT!"

But not all of Computer Era's customers count the Manhattan superstore among their friends. Some of them told their stories last year in the *Mac Street Journal*, the monthly newsletter of the New York Mac Users' Group (NYMUG). Words like *slime*, *sleaziness*, and *crooked* were flung. Five members claimed they were misinformed or lied to by Computer Era salespeople. They reported broken promises regarding delivery dates, misquoted suggested retail prices, and mischaracterizations of Apple equipment. My favorite allegation involved a woman who wanted a new mouse and a sales rep who reportedly claimed that "Macintosh mice are serialized and coded for the specific Mac CPU they're used on. We can't just sell you a mouse. You'll have to bring the entire unit in." The cost? A mere \$400, according to the *Mac Street Journal* report.

Not surprisingly, considering these complaints, some letter writers referred to the store as Computer Error. But what was the store's reply? None, according to the newsletter's editor, Wili Scher-Grodner, who wrote, "We have written and telephoned Computer Era for comment; no store employees have ever returned our numerous calls or would connect us to anyone on the executive staff."

Even the best large retail operation would be expected to have at least an occasional dissatisfied customer. But three pages of these letters gave the impression that Computer Era routinely abused its buyers. Was it true? And if Computer Era was indeed the nation's largest Mac dealer, and the charges of untrustworthiness were borne out, what did this say about Apple Computer, which authorized the store to represent it? Enquiring columnists want to know.

To Era Is Human

I HAD ALREADY MADE ONE TREK TO Computer Era as a customer. People buy

at Computer Era for its well-advertised low prices. When my wife needed a laser printer last year, I accompanied her to the corner storefront on Park Avenue South. The prices were indeed attractive, but I was taken aback by the store's operation. As soon as I crossed the threshold, it was clear that Computer Era was unlike any Apple retail dealership I had ever visited.

Before we could enter the sales area, we were confronted with a reception desk. A receptionist requested that we wait for a salesperson. After a few minutes a cordial, well-dressed woman emerged and whisked us to the sales floor, which was carpeted and austere except for towering stacks of Macintosh boxes.

I explained what we wanted and the price quoted over the phone minutes before. She filled out a sales agreement, disappeared again, and then reemerged, confirming that we could have it. But we would have to pay in cash or certified check. Since we're not in the habit of toting over a thousand dollars hard currency, and the banks were closed, we settled on an odd compromise: we would write a check, but Computer Era would also charge our American Express card for the entire amount. When our check cleared, the company would return us the unremitted credit slip, torn in half.

To my relief, we got the torn Am Ex receipt the next week. The printer worked fine—still does—and a few days later we even got a call from Computer Era asking if everything was OK. So I qualify as a satisfied customer.

Only later did I hear the stories of dissatisfied customers. These harrowing tales seem to have a similar plot line—a failed covenant leading to a mildly Kafka-esque quest for redress. Most of the horror stories I've heard are festooned with colorful descriptions of the desperate, doomed measures people take to get answers from salespeople, managers, and executives.

One such soul is Mark Robinson, a musician and NYMUG member. Condensing his Stygian tale does not convey its true depths. Basically, he claims that in Sep-

tember 1989 he bought an SE with what Computer Era described as an Apple-made hard drive. He also bought a one-year extended service contract. The drive was defective, and he discovered that it was not of Apple manufacture (Apple buys from third parties) but from a now-defunct manufacturer with a history of faulty products.

Robinson says that despite his repeated visits, Computer Era's service center did not fix the drive. Once, he says, they even tried to tell him he violated the service agreement by using a Kensington trackball. Finally, he says, several days before the agreement expired, he insisted that a service representative repair the unit. He says that the store held the computer until the contract expired and returned it to him, with the same equipment problems. After attempting to resolve the situation through the Better Business Bureau, Robinson is now planning to file a civil lawsuit. The store's alleged shenanigans led the local CBS affiliate to produce an investigative segment on the evening news under the rubric "Shame on You." The segment reportedly exposed Computer Era's practice in late 1990 of advertising Mac Classics for a low price. When people came in to take advantage of the ad, they were told to add their names to a long waiting list—or buy a more expensive computer.

Ultimately, the matter came to the attention of the New York City Board of Consumer Affairs. It received 26 complaints about Computer Era, a number considered significant and that "indicates a pattern" of abuse, according to spokesperson Pat Cohen. The situations that triggered complaints ranged from alleged bait-and-switch tactics to misleading advertising. Cohen reports that the majority of these complaints were eventually settled with the help of the agency. The investigation of Computer Era resulted in what is called an assurance of discontinuance, an agreement that the store would adhere to consumer law by advertising merchandise

continues



Computer Era

says it's

Number One,

some customers

disagree

only when it was in stock or easily obtainable, specifying delivery dates for purchases, refunding money if delivery dates were not met, and maintaining a rain check policy. In signing the agreement and paying \$2000 to reimburse the department for its investigative costs, Computer Era officially conceded no wrongdoing; however, as Cohen explains, companies that do refuse to sign such agreements face possible court action by the department.

Computer Era Responds

WHEN I SOUGHT THE OTHER SIDE OF the story, I got a drastically different picture. As soon as my call was returned by Computer Era vice president Robert Haas, it was clear that I had entered *Rashomon* country. Instead of being defensive about his business, he oozed pride.

He invited me for an inside look at his Macintosh empire. I found not a slick operator but a menschy 37-year-old. Haas and his assistant gave me the "ten-

cent tour." Considering the store's approximately 37,000 square feet and more than 120 employees, that was a bargain.

I was shown both the retail operations and a thriving corporate business that sends salespeople out to the field. I saw rooms where training seminars are allegedly held. The tour also included a quick visit to the oak-paneled office of Erwin Haas, the paterfamilias who engineered the store's transformation from an electronics store in the seventies to a dealer of MS-DOS machines in the eighties, and finally, in 1987, to an all-Mac operation. "When everybody zigged, we zagged," explains Robert Haas. For approximately two years, he says, Computer Era has laid claim to being Apple's single largest dealer. (An Apple Computer spokesperson would not confirm this, telling me no such rating exists.)

The tour included a visit to the sales floor, where Haas explained the store's unconventional approach to retail computer sales. "We organize by tables so people can sit down and be comfortable—talk person to person," says Haas. He thinks the alternative—people wandering around the store and toying with equipment—can lead to a "Tower of Babel." As for the insistence on cash sales in certain cases, he explains that for highly discounted advertised products, a credit card fee would cut into the bone-thin profit margin.

After my tour, I was convinced that Computer Era *does* care about reaching out to customers after a sale. In fact, at Computer Era, postsale contact is part of an integrated strategy that has led some to admiringly call the store a sales-generating machine. The store maintains extensive lists of customers and leads and uses hordes of telemarketing salespeople to pepper them with solicitations on a regular basis. If you buy there, rest assured someone will call you later to ask if you want more. Even people who bring their computers in for service are mined as potential leads. The lists, along with detailed follow-up sheets, are maintained by a sophisticated custom software program—Computer Era has four full-time Mac programmers on the project.

In addition, Computer Era has a "customer satisfaction coordinator" who works full-time at preventing the kind of bitter unhappiness experienced by the people who charge Computer Era with unethical practices. Mark Robinson might not believe me on this, but I saw this person with my own eyes, coordinating satisfaction even as I watched.

So why the consumer complaints? Why did WCBS say "Shame on You?"

continues

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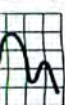
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Circle 99 on reader service card

Why did the Bureau of Consumer Affairs investigate?

Robert Haas says that no matter how hard one tries, a small minority will always be dissatisfied. On the other hand, he does concede that some ill feelings could have come from the store's extensive advertising of \$699 Mac Classics in 1990, when unbeknownst to Computer Era, none were to be had for months. He also bemoans the failure of Computer Era's voice-mail system to efficiently connect

customers to salespeople and managers. (The store has upgraded the system, and is in the process of installing a more powerful phone system.) He insists, however, that the business's intentions were always to do right by its customers. Computer Era, he contends, takes a lot of heat simply because it is the biggest.

The Apple Line

ONE VOICE WAS MISSING IN THIS *Rasbomon*-esque tale: that of Apple. So I

spoke to Godfrey Sullivan, a ten-year Apple veteran who recently ascended to the position of vice president of U.S. reseller operations. He detailed what Apple expected of its dealers: they should display its products, answer customer questions, and provide face-to-face sales, service, and support. I asked if Apple had adequately looked after the interest of consumers patronizing these dealers. "I'm not sure," he said, "that we've done a good job of that in the past." When asked what he thought of a dealership where admittance to the sales floor was restricted by a receptionist, and where free access to product demonstrations was not encouraged, he said, "I might find that a little unusual," adding that though Apple did not require its dealers to accept credit cards on all sales, he'd consider a cash-only policy odd.

I asked whether it was Apple's policy to monitor dealerships for unsavory tactics. Sullivan was emphatic that Apple did not tolerate certain practices, like bait-and-switch, yet he was vague on Apple's enforcement measures. He said that matters might be helped by a toll-free phone line for customer feedback Apple set up last year. Sullivan confirmed that Apple hopes to expand its retail channels to include so-called superstores. These will presumably deliver Macintosh products at low prices.

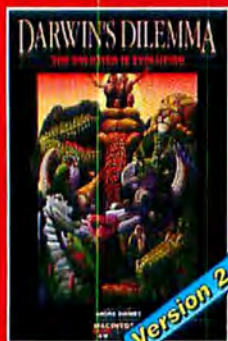
But I wonder if the concept has its perils. Stores designed to sell in high volumes have a tremendous built-in pressure to maintain those volumes. Inevitably, whether through negligence or simply routine mix-ups, some people will have problems. The question is what happens when they seek redress. Will Apple maintain dealer guidelines that keep these poor suckers out of consumer hell? Or will they be dismissed as a small minority who slipped through the cracks?

Robert Haas thinks it would be unfair to consider his store in a discussion of malefactors in the Macintosh world. Computer Era doesn't mistreat its customers, he says—its success comes in part because of considerable attention to customer satisfaction. As proof, his assistant shoves two file folders at me, bulging with unsolicited letters from satisfied customers. I browse through them and indeed they contain accolades from satisfied buyers. Yet one missive seems out of place. It is a complaint letter from an unhappy customer—another horror story.

How it got in the folder, I don't know. Some things just slip through the cracks, I guess. **m**

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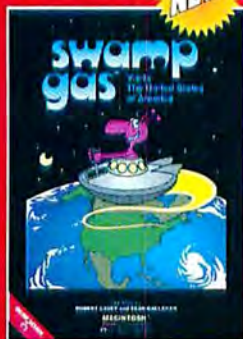
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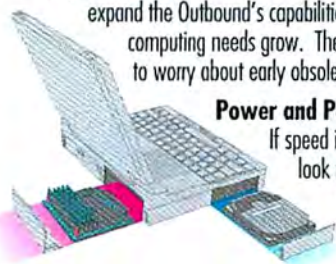
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Satisfied Customers Real Key to Determining Effective Macintosh Training Options

by Randall D. Smith
President MacAcademy

Is reading a computer manual really the best way to learn a computer program? Isn't it easier to use videos, audio training or live training workshops?

Our phones haven't stopped ringing since David Pogue's article appeared in December's issue of *MacWorld Magazine*. "Is this guy for real?" "Does he really think the best way to learn programs is by reading the manuals?" "Did he really view your training videos?" "Has Mr. Pogue ever taught anybody anything?"

To update the fortunate ones who missed the article, Mr. Pogue, under the heading of *The Desktop Critic*, wrote an article in December's issue basically condemning most third party training programs available for the Macintosh computer. His final comment was, "Frankly, there are better ways to learn software—like reading the manuals."

MacAcademy Videos

MacAcademy videos were one of those "reviewed" by Mr. Pogue. Two things were very obvious from the outset of the article. One, that the author takes his title of *critic* very seriously, and two, that he hasn't spent much time in the real world of Macintosh training.

Weakness or Strength?

Mr. Pogue's critique of the MacAcademy videos were as follows: 1) They were filmed with instructors speaking in real voices instead of reading from a prepared script; 2) Real instructors were used instead of paid professional actors; 3) MacAcademy tapes did not use enhancements such as musical backgrounds and breakaways using outdoor scenery; 4) Occasionally an instructor would slip and use the wrong word on the video such as calling a



Over 2,000 people signed up for the seven MacAcademy training sessions at *MacWorld Asia* in Hong Kong. Randall Smith, President of MacAcademy teaches Aldus PageMaker user techniques, tips, and short-cuts.

document a program; 5) That nothing was actually *created* in the program but rather a *tour* of program features was all that was shown. The article did point out that the videos were extremely reasonably priced at only \$49 each and carried a full 30 day money-back guarantee.

5 Years Training Experience

Unlike Mr. Pogue's limited view, MacAcademy's experience has shown that next to live workshops, video training is the most effective method of training available. People don't like computer manuals. They don't understand them and they won't take the time to read and study them. Computer manuals are written by computer techies. The average Mac user doesn't understand computer language and usually gets lost in the manuals.

A recent article in *MacWeek Magazine* (9/10/91 Pg.63) contradicts Mr. Pogue when it comes to training. The article states, "Videotape training has become the most popular alternative

to classroom instruction. Video and audio training makes sense for employees who can't be away from their desks for more than a day." And also stated, "But when you carefully consider your company's particular needs, you may find that self-paced tutorials can supplement or replace the classroom in a cost-effective manner."

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MacAcademy videos capture the spirit of a live classroom with the instructor on videotape. Our customers don't want people reading scripts blandly into the camera. They don't want to listen to an actor who doesn't know the program. And they certainly don't want to pay \$479 for a 2-hr. video just to have music and nice outdoor footage. Our customers want straight forward, no-nonsense, effective training at a price they can afford.

MacAcademy videos, unlike whatever Mr. Pogue thought he was watching, do create actual documents and take you step-by-step through each

Effective Low-Cost Training

feature of the program. Each step is explained in detail along with excellent short-cuts and user techniques.

The Proof

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MacAcademy videos are successful for two reasons: they are effective and they are affordable. Each video comes with a complete 30 day guarantee. As of today, after tens of thousands of videos being sold, less than 1% have been returned. In other words, 99% of all MacAcademy video buyers are satisfied with the valuable training offered in MacAcademy training tapes.

So who is right? Mr. Pogue in his infinite wisdom and extensive training background (it says David's favorite activity is helping fellow New Yorkers take their first step into the Macintosh world. I guess this means throwing those Mac users a manual and telling them to go for it.) or tens of thousands of satisfied MacAcademy customers?

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The Storage Spiral

BY DEBORAH BRANSCUM

NATHAN SCHULHOF WANTS you to know it is not his fault Jasmine folded. The former vice president for sales and marketing at Jasmine Technologies was hired a few months before the storage company emerged from Chapter 11 bankruptcy in July 1990. His job was to help bring Jasmine back to health. But it didn't quite happen that way. Like many Macintosh storage companies last year, Jasmine found itself in a shrinking market, with lower profit margins and more competition than ever. The defeated company closed its doors last fall in the face of a creditor's lawsuit that Schulhof said the company couldn't afford to fight.

The same forces that Schulhof says killed Jasmine generally make hard drives a bargain for consumers. Overproduction of 3.5-inch hard drives by manufacturers has brought the price down on the most popular models, according to Phil Devin, director of computer storage research for Dataquest of San Jose, California. That translated, at press time, into prices under \$300 in advertisements for the least-expensive 50MB drives. (It wasn't always thus. The January 1986 issue of *Macworld* lauded Apple's "new" Hard Disk 20 for its "competitive price of \$1499" and its "relatively high storage capacity of 20.77 megabytes.")

Good News, Bad News

THE SAME PROCESS THAT LOWERS prices for consumers sometimes wreaks havoc in the storage industry. As Ron Wolf put it in a *San Jose Mercury News* article last summer, "Even in the best of times, disk-drive companies must struggle to keep up with exceptionally rapid improvement in recording technology and its relentless effect upon prices. Each year or two, manufacturers find a way to squeeze twice as much data onto a magnetic disk. The process, which has the effect of driving down prices for data-storage products, has continued for three decades and shows no signs of slowing."

The resulting low prices aren't unmitigated good news for consumers. Sure, resellers buy drive mechanisms at lower cost. But they are also pressured to

sell their drives at lower cost, in the face of fierce competition that keeps profit margins ever smaller. Too small, say some executives, to adequately support and service their customers. As a result, some companies close their doors, leaving users with worthless warranties. Others diversify their offerings or move out of hard drives altogether.

Everex Systems is one such company. By the end of January, its EMac subsidiary will no longer sell hard drives for the Macintosh, although it will continue to service and support existing customers.

"The main reason is just plain and simple economics," says David Le, Everex group manager for peripherals. "There are too many vendors of subsystems." The problem, says Le, is that consumers can't tell the difference between EMac's drive and those of its competitors. "When users look at the package, they look at price," says Le. "We get caught in that kind of game and we've never been able to win it."

Storage prices have dropped across the computer industry as a whole, but Macintosh drive companies have faced particularly tough times recently. "The aftermarket for Apple products has diminished very, very dramatically," says Dataquest analyst Devin. An Apple Computer spokesperson said a simple majority of Macs have shipped with internal hard drives for some time; currently, the "vast majority" include hard drives. Devin estimates that more than 80 percent of Macintoshes are shipped with hard drives from the factory. Despite increasing Mac sales, that leaves considerably less business for storage companies.

Dead Again

I SPOKE TO SCHULHOF SEVERAL times last fall as his company collapsed. He doesn't feel responsible for the company's failure.

"Looking back, I think Chess S.A. [Jasmine's European owner] and myself did an excellent job," Schulhof says. "When Jasmine came

out of bankruptcy, on July 18, we took \$100,000 in monthly sales and brought them to \$1 million in monthly sales. And we repaired more than 2500 prebankruptcy drives. . . . In looking back, there's really not too much we could have done differently."

The reason, claims Schulhof, is that Jasmine had an installed base of more than 150,000 to support in a declining market and a faltering economy. Jasmine's profit margin dropped from 30 percent to 20 percent. Hard drive companies that sell 40MB drives at \$299 are making a 20 percent margin, says Schulhof. That's \$60 per drive. A company needs salespeople, tech-support staff, and other employees to track product sales, diagnose returned drives, and ship new and repaired products. "Here we've just made \$60," says Schulhof. "You get one service call, you've wiped out your profit. Without profit, you can't continue." The key to survival, says Schulhof, is high margins and a diversified product line.

Jasmine's death is the end of an era, Schulhof says, in part because consumers have changed. "Three years ago, most users had no idea what kind of mechanism they had in their drives and they didn't care. Now they know." According to Schulhof, most Mac owners look for the best price on a mechanism built by a particular company, not for a brand name on the drive itself. "Unless Mirror makes some changes, it's headed down the same road as Jasmine," he says. "And so are all the other drive makers."



*Prices go down,
capacity
goes up, and
some
companies are
caught
in the middle*

Mirror Responds

MIRROR TECHNOLOGIES BEGS to differ. Company president Ron Eibensteiner takes exception to the notion that his company is on the way out, or that Jasmine was an innocent victim of hard times. "The reason Jasmine went out of business was not because Apple started bundling hard drives," says Eibensteiner. "Jasmine went out of business because operationally Jasmine was mismanaged. I looked at

continues

buying some inventory and product groupings from Jasmine [last summer]. I walked through the facility, and it was very apparent to me... that the company wasn't going to be around for much longer... The thing that will keep storage companies in business [is] operations. When I walked through Jasmine, I saw operations that were very sloppy." (Schulhof denies this was the case.)

Like Jasmine, Mirror has faced tough times; it nearly went out of business in 1987. The peripherals company was drowning in red ink—it owed \$1.1 million to lenders and \$1.2 million to vendors. Ron Eibensteiner stepped in as CEO and president in 1988. The public company is still posting losses, but last fall Mirror's sales were up 72 percent compared to nine months before and Eibensteiner predicts Mirror will show a profit next year. Still, why should consumers believe that Mirror will thrive?

"At skinny margins, we can do a better job than anyone else. That's not to imply we will be the lowest price. We won't be," he says.

The Ehman Example

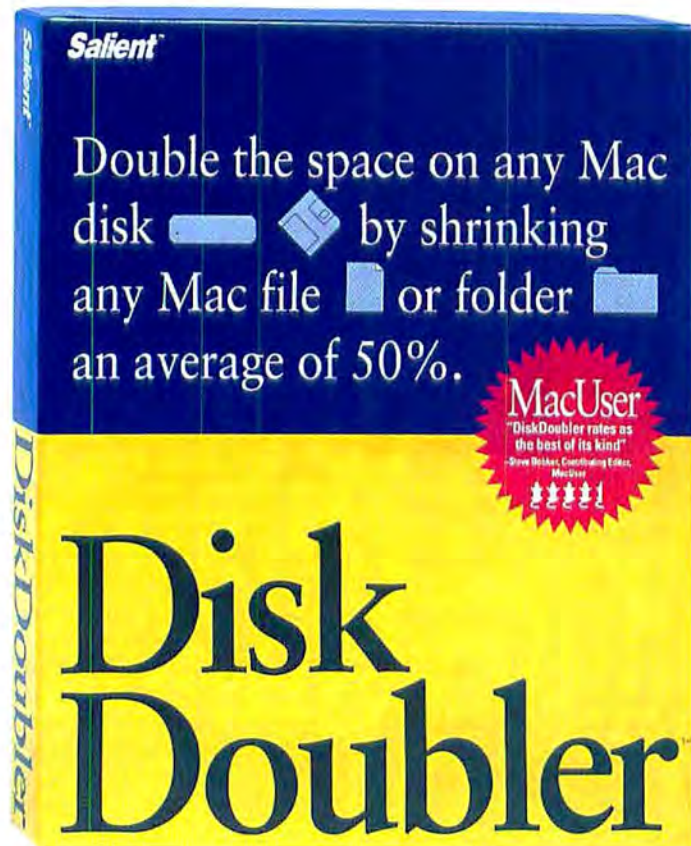
EHMAN, FOR ONE, DISCOVERED THAT rock-bottom prices could help build a

business but not necessarily sustain it. Like Mirror, the company was founded in 1985 to sell memory upgrades; it then branched into storage and other peripherals. At first the company simply stressed price and value. But in mid-1989, Ehman's advertising began directly comparing its prices against those of competitors. It was an effective strategy. According to several sources, Ehman's sales grew some 1000 percent between December 1989 and December 1990.

In the summer of 1990, competitors pointed to Ehman as a candidate for problems because of its low prices and low margins. At the time, company president Michael Ehman denied his company couldn't live on low margins. Today, he seems to have a somewhat different perspective, fashioning himself as the rugged Macintosh individualist who tried to face down a bunch of ornery outsiders. "We came in and offered good value," says Ehman. "Then a bunch of IBM guys like Hard Drives International came in and undercut us. And we tried to match them for a while, defend the Mac world against them, but then we decided [a year and a half ago] to take care of ourselves. That's when we stopped selling on price."

The company did run into a crisis last year, but not directly as the result of low margins. Ehman was tripped up by management problems that were exacerbated by intense growth and too little capital to fund that growth, according to company officials and consultants. Like some others in the industry, Ehman set up a credit line with a financial service company. According to industry sources, such services offer manufacturers a cash-flow buffer by promptly paying suppliers for components. After the manufacturer assembles and sells its inventory, it pays the financial service for the loan, plus an interest charge. About a year ago Ehman lost the credit line used for paying suppliers, in part because of sloppy accounting practices. The resulting cash-flow squeeze was compounded by a kind of management do-si-do, in which Michael Ehman ran the company, then hired a replacement, then fired the replacement and returned to the helm. In the meantime, drive repairs mounted and so did back orders for products, company officials say. At one point, sales dropped by half, according to Ehman consultant Kin Seto. Sources say the company lost money in 1990 and 1991.

continues



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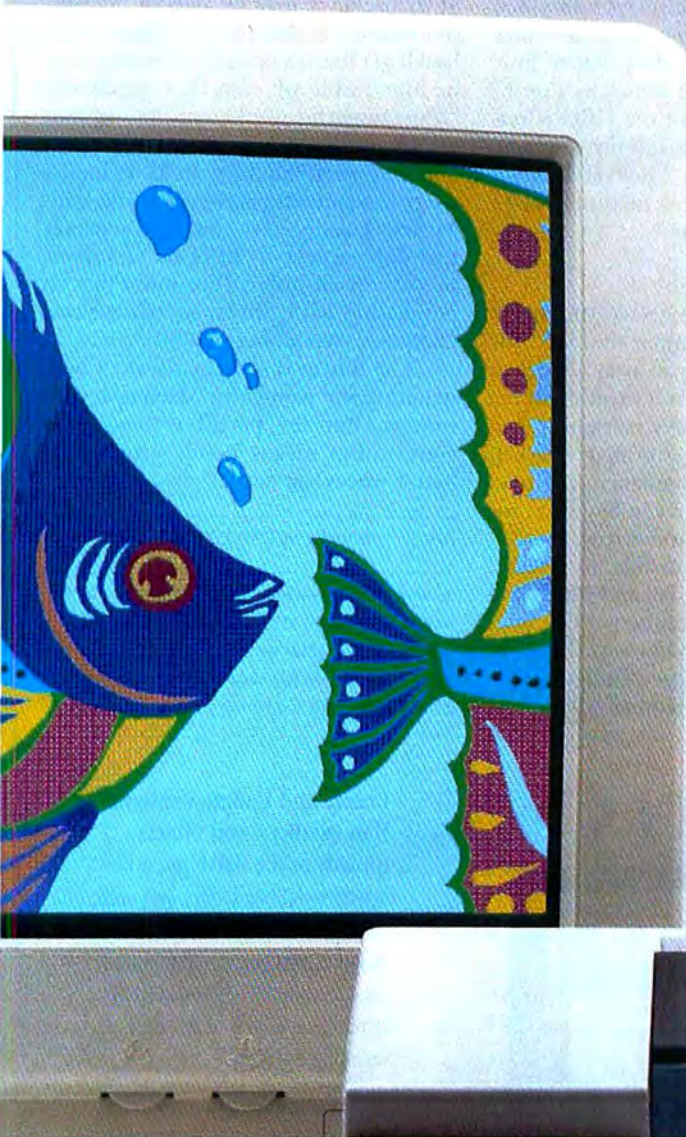
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Service Hero

James Turner of Roanoke, Virginia, writes in praise of Qume. Until recently, Turner was quite happy with his Qume Crystal-Print laser printer. "But with the advent of System 7, I was disappointed to receive errors when I tried to print TrueType fonts. I called Qume's technical support to try and purchase an upgrade. I was amazed when Qume told me they were aware of the incompatibility and then shipped me an upgrade via UPS second-day air at no charge. My printer was six months out of warranty and they happily sent me an upgrade that rectifies the only qualm I had with my printer."

By the time I visited Ehman in Evanston, Wyoming, last fall, the company's problems of the spring and summer seemed resolved. Virtually all defective drives had been repaired and returned, according to officials, and the product-order backlog was nearly filled.

Michael Ehman is a classic entrepreneur. Though he is reportedly brilliant, no one claims he's a good manager, least

of all the man himself. But that may change. A team of consultants is helping him face the growth and management issues that threatened the company's existence a year ago. More than half of Ehman's sales are now displays and video products, and the company plans other offerings to diversify its product line. That doesn't mean the company's problems are all solved. But the CEO is optimistic. "We're not financially troubled, we're set now," says Michael Ehman. "Our debt has been restructured, we're increasing profitability."

Buyer Beware

WHETHER SLOPPY MANAGEMENT OR slow sales killed Jasmine, the need for storage is not going to go away. As prices drop, marginal companies will continue to be squeezed by lower margins, a bad economy, and a smaller primary market, thanks to Apple's dominance. It's possible that the company you buy from today may not be here tomorrow.

Because it's impossible to predict which companies will fail and which will thrive, take some precautions when buying a drive. Do your homework by researching products (see "Budget Storage," *Macworld*, September 1991, and

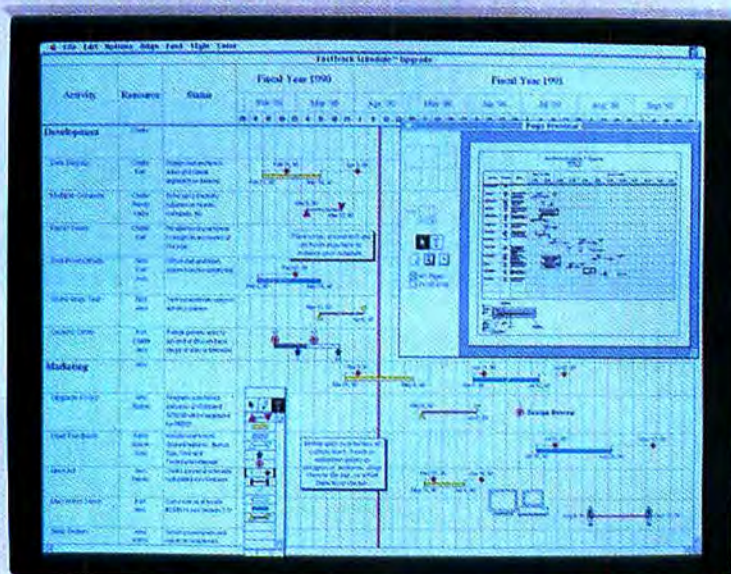
"Seeking Midrange Hard Drives," in this issue, for recommendations) and company reputations through dealers, user groups, and bulletin board services. Be wary of long delays in product deliveries. Such backlogs may be due to demand (remember the Macintosh Classic order backlog?) But it's possible a backlog may be the result of cash-flow problems. "Most underfinanced companies cannot afford sufficient inventory for prompt delivery," says Ralph Fascitelli, an industry consultant who currently works with Mirror. Finally, steer clear of companies that don't accept credit cards, and never prepay for an order. (For more tips on purchasing hard drives, see *Conspicuous Consumer*, September 1990.)

The flux in the market is often both irritating and painful for Macintosh consumers. But the payoff is big—more competition means better products at better prices. **m**

Research assistance by CAROLYN BICKFORD.

Send nominees for sainthood to *Service Heroes*, *Macworld*, 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

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Updates

FEBRUARY 1992

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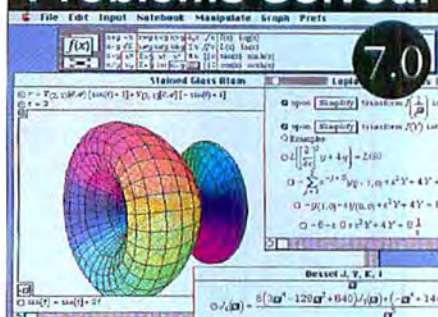
PRODUCT	V.	REQ.	★	\$
4TH DIMENSION	2.2	1MB/6.0		\$99
A4	3.0	2MB/6.0.5		\$395
AATRIX CHECKWRITER II	3.02	512K/4.1	*	
ACCOUNTANT, INC. PROFESSIONAL	3.0	1MB/6.0.3	*	
ACCUTEXT	3.0	4MB/6.0		\$150
ACTA 7	7.0	512KE/6.0.5	2/92	\$33.50
ADDNOTION	2.0	2MB/6.0.5	*	
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ADOBE ILLUSTRATOR	3.2	2MB/6.0.3	*	
ADOBE PHOTOSHOP	2.0	2MB/6.0.2	9/91	\$199
ADOBE TYPE MANAGER	2.0	1MB/6.0.2		FREE
AFTER DARK	2.0	512KE/4.1	5/91	*
AGENT DA	2.0	1MB/6.0.5		\$30
AGFATYPE	3.0	2MB/6.0.2		FREE
ALARMING EVENTS	1.0.3	1MB/6.0.2	11/91	\$15
ALDUS DIGITAL DARKROOM	2.0	1MB/6.0	9/91	*
ALDUS FREEHAND	3.1	1MB/6.0.5	8/91	*
ALDUS PAGEMAKER	4.01	4MB/6.0.3	*	
ALDUS PERSUASION	2.0	1MB/6.0.5	*	
ALDUS SUPER 3D	2.5	2MB/6.0.5	*	
ALDUS SUPERPAINT	3.0	1MB/6.0.5		\$65
ALLIANCE POWER TOOLS	2	1MB/6.0.4	*	
AMAZING PAINT	1.0.1	512KE/6.0.4		\$15
ANTITOXIN	1.4	512K/3.2		\$15
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ARCHICAD	4.0	5MB/6.0	10% of list	
ASHLAR VELLUM	2.10	4MB/6.0.2	*	
ASHLAR VELLUM 3D	2.10	4MB/6.0.2	*	
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A/UX	2.0	4MB/6.0.5	*	
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BILL-IT	2.6	1MB/6.0.3	*	

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CA CRICKET PRESENTS	2.0.1	1MB/6.0	*	
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— MacWorld magazine, May 1990.

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LAPLINK MAC PLUS III	3.0	512K/2.0	*	
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MASTERFINDER	1.1	1MB/6.0.5	6/91	*

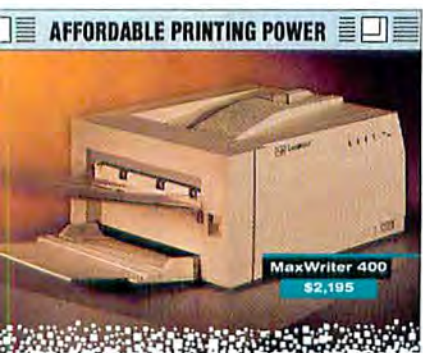
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MYDISKLABELER III	3.0.4	1MB/6.0	*	
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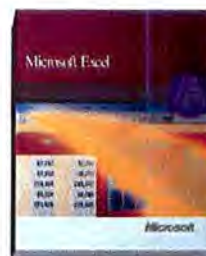
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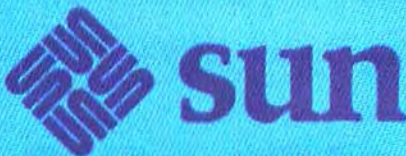
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Lab Notes

Of E-Mail Testing and Macros

BY TIM WARNER

E-MAIL WORKS WELL MUCH OF THE time, but there are also common problems, from lost mail to dialog boxes that say "unable to read message" or "the server is busy; try again later." Somehow, in the real world, these problems seem to happen only when you need to get something done. Put an E-mail package up on a laboratory bench, isolated from the complexities of the company network, and the package behaves like a prince.

For "Opening Up E-Mail," in this issue, Macworld Lab set out to duplicate how electronic-mail packages work on a real-world network with varying volumes of network and server use. We knew that any real-world scenario would be something of an abstraction—every office has a different pattern of network and E-mail use depending on many factors, including the size of the network, the number of people working at the time, how hard they are working, what kind of work they do, and so on. How can the real world be duplicated meaningfully in a test setting? Complicated networks frequently have traffic generated by network modems, workgroup software, and diagnostic software, for example. With so many sources of traffic, we had to make sure we were testing E-mail and not the rest of the network. Armed with that knowledge, we designed two test procedures to measure electronic-mail performance.

Measuring Performance

FIRST, WE WANTED TO FIND OUT HOW E-mail packages perform when accessed by a single user, a common E-mail scenario. And because network traffic is sporadic, it was important to see how one person would be affected when there were

varying amounts of server use—from absolutely none to very heavy use. We used three Macintoshes in our single-user setup, which was modeled on Microsoft's comparative test suites. One computer represented a user by sending, receiving, deleting, and saving electronic messages. Another computer acted as the server, storing and routing messages between users. A third computer generated additional E-mail traffic to simulate a volume of messages (also called a load) moving back and forth between other

network users and the server. We tested this setup four ways: with no load, with a normal load of E-mail messages, with a heavy load of E-mail server use, and with heavy AppleShare network use. We timed how long each of the five E-mail packages in the feature took to send, read, delete, and save messages under varying loads.

Second, the Lab wanted to uncover the speed and reliability of the E-mail server. This required a multiuser test, which was inspired by, although not modeled after, tests done at CE Software. We used six computers for this setup, with each sending the same complicated string of messages and enclosures to and from the mail server. This test was also designed to show if the E-mail packages could handle up to six users concurrently. We hoped to see if any messages got lost or damaged in the process.

Once the testing procedures were established, the problem remained of how to generate consistent network and mail-server loads to fairly measure each electronic-mail program. We briefly considered using a network utility to transfer random packets over the network, but

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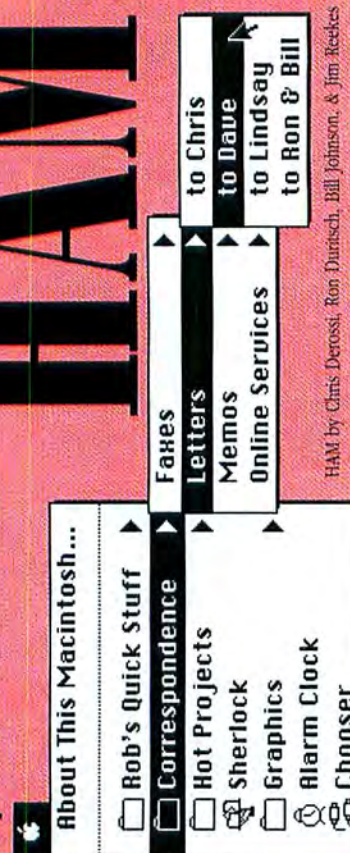
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HAM by Chris Derossi, Ron Durtisch, Bill Johnson, & Jim Reekes

LAB NOTES

quickly realized such an approach would not have tested the E-mail server at all because such utilities do not interact with the server. Also, network utilities are primarily diagnostic tools that do not lend themselves to simulating the sporadic nature of a real network, where people randomly print, send E-mail, use AppleShare servers, and play network games.

Macro Hell

FOR CONSISTENCY AND EASE, WE DECIDED to create macros that would simulate real-world E-mail use over the network by, among other things, composing messages and sending, reading, deleting, and saving them. Because we needed to have our macros pause between some steps—to let the computers catch up with E-mail operations—we at first looked for a program that would let us simply edit the macros to add the pauses. But what seemed simple was much more difficult than we imagined.

Macros that worked flawlessly on a single system in the network buckled repeatedly under the stress of background traffic created by the computer generating the loads. In some cases, when an E-mail program waited for the server and displayed a dialog box saying the server was busy, the arrow cursor scuttled across the user's screen as macros continued to execute at full speed. When the message transfer was complete, the macros were several steps ahead and no longer in sync with the E-mail program; the result was complete havoc.

Early in our testing, these problems forced us to switch from AutoMac III, which lacks a flexible wait command, to QuickKeys², which has an extension that waits for a window or dialog box to open or close before executing the next macro step. (Although we gained some flexibility, we lost AutoMac's ability to call other macros, the way some programs call subroutines, a technique that simplifies software design and debugging.) Then we timed the pauses needed for transferring messages and added that lag time to our macros. In other cases we added macro steps that waited for dialog boxes to disappear. Writing the macros, which we expected to take about 5 hours per program, ballooned to 16 hours per program as we rewrote them over and over again.

When we attempted to really challenge each E-mail server by sending and retrieving multiple messages with enclosures from the six users to the server at the same time, the macros proved impractical. The time a message took to transfer varied by as much as 30 seconds under different loads; at times, unexpected dialog boxes demanded user feed-

back. This inconsistency made it impossible to use identical macros on all workstations; the macros got out of sync, and made the test results invalid. In the end, to our disappointment, we settled for having each of the six computers send a single message, with an enclosure, to the server. Despite the problems, we believe our test set—based on vendor tests, Macworld Lab experience, and a little common sense—is a good representation of how most of our readers work.

If any of the macro programs had been more like a programming language, we could have written subroutines to handle the inconsistencies and variable durations of operations. With a program that had conditional operators (such as IF-THEN-ELSE statements), the ability to go to a specific step, short variable strings, and WHILE loops with counters, we could have solved our problems easily and saved a lot of time.

Instead, we spent three full days tweaking the QuickKeys² macros for QuickMail, meticulously accounting for one problem set of dialog boxes only to have the macro break again later when another problem cropped up. Had we been able to use a few IF-THEN statements, in combination with the Wait-Dialog extension, we could have made our macro check to see if additional dialog boxes were displayed and then wait for them to disappear, or we could have written a couple of lines to deal with random dialog boxes.

Future Tools

AS OUR DIFFICULTIES HAVE SHOWN, the tools don't exist yet to create a real but controlled and consistent mail network—but they are coming. Although limited, QuickKeys² extensions are a step in the right direction. The interapplication communication (IAC) capabilities of System 7 are promising, too. With IAC you can send commands to many programs and get results. For testing electronic mail, this could mean creating a script that commands an E-mail program to send a message, then asks the program to say when the message has been sent. Test scripts could be written very quickly by using scripting programs that require System 7, such as Frontier or Control Tower. Of course, using IAC scripts to instruct a package to send or read mail will require that all these E-mail programs be System 7-savvy, which hasn't happened yet. (So far, only QuickMail supports IAC capabilities.) Once they are, the IAC capabilities of System 7 should simplify testing considerably. And as better tools emerge, we'll be ready to implement them here at Macworld Lab. **m**

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- Your credit card is not charged until your order is shipped. For domestic orders, if we must ship a partial order, freight is not charged on backorder.
- Most personal and company checks received by mail will clear immediately. All checks or purchase orders must have a phone number and contact person listed in order to be processed.
- C.O.D. orders are accepted: Limit \$1,000 per order. Cashier's check or money order only. Add \$5.00 per C.O.D. order.
- Educational, government and corporate purchase orders accepted.
- All U.S. shipments insured at no extra charge.
- No sales tax, except for Washington State residents (add 8.2%).
- Prices and product availability subject to change without notice. All specials and promotions are limited to available stock. Call for current prices.
- All products covered by a 120 day limited warranty.
- Shipping is \$3 per order. We ship via Airborne Express Overnight service. (Some rural areas require an extra day for delivery.)
- Monitors are assessed at an additional shipping charge. \$25.00 for Full Page, \$50.00 for Two Page. UPS Rates are also available upon request.
- Orders placed by 9 pm ET (6pm PT) weekdays for "in stock" items will ship that day for overnight delivery (barring system failure, etc.)
- APO/FPO/PO box orders are shipped first class U.S. Mail.
- Defective software will be replaced immediately, and hardware will be repaired or replaced at our discretion.
- For Customer Service call 1-800-248-9948. A Return Authorization Number is required for any product returned. Please call weekdays from 6 am to 8 pm PT, 9 am to 11 pm ET.

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- Logitech
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- Memory Utilities
- Screen Utilities
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- Hard Drive Utilities
- Modems/Fax
- Communications
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- Special Values

Mac Zone 18005 NE 68th Street, Suite A110, Redmond, WA 98052
International: 206-883-3088 • FAX: 206-881-3421

MAJOR CREDIT CARDS ACCEPTED

The Mac
Zone
Established 1984


**ABBOTT
SYSTEMS
CALC+**

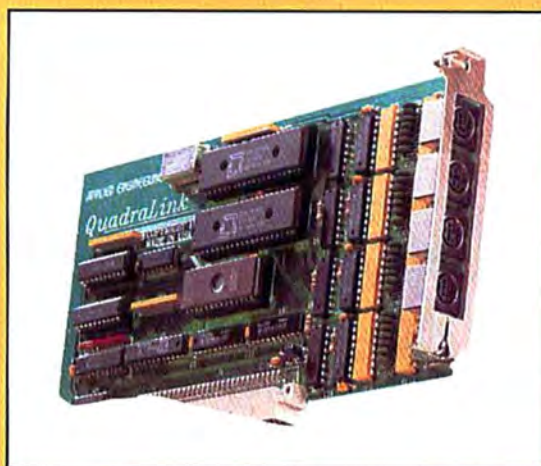
Calc+ is a major upgrade to the standard Macintosh calculator. It's perfect for users of spreadsheet and desktop publishing software. Because Calc+ gives you all the real features, plus some very productive ones: Desktop Publishing mode - for calculations in inches, centimeters, picas and e-ros...plus instant conversions. Paper - print a complete hard copy audit trail. "minimize" button - reduces Calc+ to a small icon, so you can keep it "parked" on your desktop for instant use.

\$33

**WACOM INC.
Wacom 510 C
ix9 Tablet & Pixel
Paint Pro 2.0**

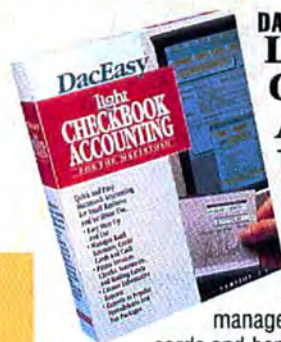
The Wacom Tablet has added a new dimension to the world of Macintosh graphics. Its cordless, pressure-sensitive stylus translates manual pressure into line width, spray density, color changes, or even "wetness" and dryout speed, depending on software. Use this feather-light stylus to paint, draw, trace, point, open, and close.

PixelPaint Professional is the first application specifically written to take advantage of Apple's new 32-bit QuickDraw software. It includes all the features of PixelPaint 2.0 like the PMS color selection, dithering and the ability to make color separations.

\$899

**APPLIED ENGINEERING
QuadraLink**

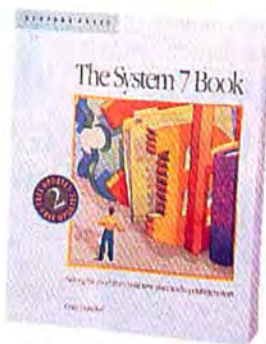
QuadraLink is the answer to clogged serial ports. With the proliferation of popular serial devices, printers, scanners, digitizers, plotters, modems, graphics tablets and the like, comes the need to control several serial ports simultaneously. QuadraLink is fully compatible with the Mac's Communication Toolbox and System 7.0 (when released). For software, the QuadraLink package includes software to create a "Shadow Driver" so

its serial ports will be recognized by the software. Like the Mac II's existing serial ports, QuadraLink's four serial ports are standard Mini-8 DIN connectors. QuadraLink carries a full five-year warranty. #03673

\$208

**DACEASY CO.
Light
Checkbook
Accounting**

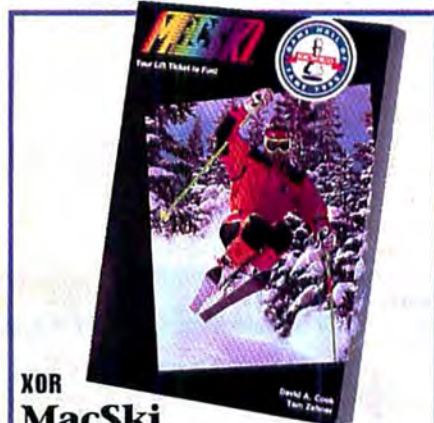
The leader in accounting software brings you the perfect personal and small business accounting system. At home -

manage your checks, credit cards and bank accounts. At work - track customers, vendors, manage AP and AR, track cash flow and more! #04312

\$19

**VENTANA
PUBLISHING**
System 7 Book

It's sleek, it's sophisticated, it's System 7 - the incredible new operating system Mac fanatics have been waiting for. Craig Danuloff, noted Mac author, spent almost two years discovering the ins and outs of System 7. And you can have all his expertise at your fingertips in THE SYSTEM 7 BOOK. You'll breeze through the basics, learn to use all the new features, and uncover the tricks and shortcuts that aren't documented anywhere.

#04238

\$19

**XOR
MacSki**

MacSki brings the slopes to you. Select a course from a number of challenging runs or design your own using the Course Editor. MacSki is your lift ticket to FUN. #03625

\$37

FUJI
Floppy Disks

High quality, 100% error free disks with lifetime warranty in 50 disk bulk packs. Up to \$2 per box manufacturer rebate - see box for details.

**DS/DD
\$14**

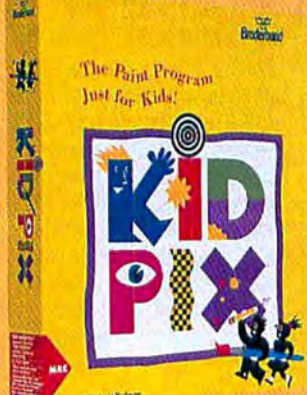
#02657

**DS/HD
\$19**

#02658


OPEN 24 HOURS • CALL: 1-800-248-0800

BRÖDERBUND
Kid Pix
 Kid Pix is an amazing paint program created just for kids. It combines special effect art tools, picture stamps, sounds and magic screen, transformations turn the computer into a magical art studio. With Kid Pix, you don't just paint a masterpiece, you hear it too! Every brush and tool has its unique sound effect. You can even record greetings, poems, or music to enhance your creations.
 #03994



\$31

INTERPLAY
Battle Chess
 The chessboard comes to life with Battle Chess, the first animated chess game. Watch pieces move and battle over the squares in full VGA graphics with digitized sound effects. Ten levels of difficulty, play versus the computer, face to face, or watch the computer play against itself.
 #04134



\$29

INTERPLAY
Checkmate
 The most powerful and versatile chess program on the market, with state-of-the-art graphics, a highly intuitive user interface, and the widest range of features found on any micro-computer chess program.
 #04135



\$34

ELECTRONIC ARTS FOR YOUR ENTERTAINMENT

World Atlas
 World atlas, almanac and world fact book, with instant access to over 240 EGA/VGA color maps and database of information.
 #03589



\$49

Starflight II
 The Spemin, once the "whipping blobs" of the cosmos, have become the galaxy's most feared race. Your mission is to find out why.
 #04346



\$39

SimEarth: The Official Strategy Guide
 The special scenarios developed for this book will enhance the SimEarth owner's enjoyment and understanding of this popular and topical game.
 #04303



\$18

PGA Tour Golf
 Tee off against 60 top PGA Tour pros in real tournaments on actual courses. Stunning color or B&W graphics with TV-style coverage. Fast and accurate ball play.
 #00473



\$38

AD & D: Secrets of the Silver Blades
 The frigid valleys of the Dragonspine mountains echo with the desperate plea of terrified miners. Unwittingly digging in unhallowed ground, they have disturbed an ancient vault and released its terrible content. Scores of horrific creatures now infest the mine shaft — and threaten to escape into the world above!
 #04304



\$39

GAMES BY TOYOGO

GO JUNIOR
 An ideal introduction to a lifetime of education and enjoyment.
 #04495

GO MASTER
 Go combines Japanese philosophy and business strategy into this national game.
 #04493 Go Junior \$20




\$41

Deluxe Toolkit
 NEMESIS Deluxe Toolkit enhances Go study with our two improved tutorials: NEMESIS Joseki Genius™ - a corner openings tutor, and NEMESIS Tactical Wizard™ - a tactical life and death analyzer as well as our newest addition NEMESIS Scribbler™ - a powerful game recording and annotation system. Used as a stand alone product, it also supports human-human play, modem play, and board editing. Installed into Go Master you have the most complete Go playing & tutorial system in the world.
 #04494




\$84

CENTRON SOFTWARE
Casino Master
 Feel the suspense-filled action of casino gambling with Casino Master. Learn and practice at your own pace without risk. Includes Craps, Roulette, Blackjack Ace, Poker, and Baccarat with complete manuals including rules and betting strategies. Not copy protected.
 #02471 B&W \$44
 #02470 Color \$44



\$40

Puzzle Master
 Now you can use your Mac to solve crossword puzzles, or create your own puzzles for fun or profit.
 #04554



\$26

INTERPRISE SOFTWARE

Cyberblast

More to shoot, dodge, and grab than any arcade Hit on the Mac! Excellent sound effects as you wind your way through 60 action packed levels - the clock is ticking and each level is more difficult to solve than the last. #04189



\$24



POSTCRAFT INTERNATIONAL

Citadel with Secrets

Your quest is to free the Lady Synd imprisoned by the Wizard. You'll experience knockout sound and graphics as you create your own foes, encounter might and magic, and engage in realistic combat. Enjoy Citadel secrets - more than just a book - a fascinating journey of one explorer's wanderings through depths of the Citadel. #03129

\$28



SOFTWARE TOOLWORKS

The Hunt for Red October

The Kranzy Oktyobr has defected. As Captain First Rank Marko Ramius, you must carefully navigate the Red October, a fearful Soviet Typhoon class ballistic missile submarine in the fjords of the North Sea to a safe harbor in the United States. #2288

\$20



XOR CORPORATION

TaskMaker

The world has plunged into depression and devastation...the once mighty Kingdom is no longer. You must restore order and prosperity to the Kingdom, but you have no experience. To get help, find the TaskMaker, and with his guidance and your courage, the Kingdom might be saved! #2909

\$26

FTL

Oids

Rescue the OIDS from the fiendish Biocretes who are turning them into vending machines and household appliances! Create your own games with the OIDS Construction set.

Design your own planetoids and puzzles in minutes with simple cut-and-paste operations. Make new games for yourself or trade with friends. #00240



\$29



BRØDERBUND SOFTWARE

RoboSport

RoboSport combines the tactical challenge of chess with the intensity of guerilla warfare to provide total strategic mayhem. Armed with bombs, bullets, missiles, grenades and more, you control teams of Robots that compete in 5 different sports: Survival, Treasure Hunt, Capture the Flag, Hostage and Baseball. Plan your tactics, instruct your troops and kick Robutt! #00145

\$34

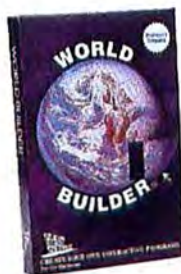
QUALITY GAMES FROM SILICON BEACH

SILICON BEACH SOFTWARE

Beyond Dark Castle

Beyond Dark Castle is an exciting arcade-style game designed for those who like their action fast and furious. The game features stunning graphics, full-screen scrolling in the Castle's complex mazes, a flying jetpack used to get over the swamps and forests, and Silicon Beach's unique RealSound™ effects, creating an eerie feeling of realism throughout the game. #01376

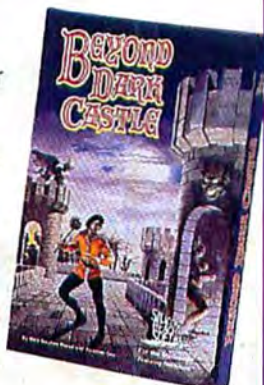
#00689 Dark Castle \$35



World Builder™

Have you ever felt the urge to create your own adventure game? Do you need to produce training materials that are scene oriented? And yet you're not a programmer. Here is the solution! World Builder gives you all the tools you need to make your own professional-quality, stand-alone games, training programs, etc. #04600

\$32



\$54



SOFTSTREAM

The Classic Trilogy - Gift Edition

Improve your skills or teach others these traditional card games: Cribbage, Whist, and Hearts. Includes everything you need to play with friends, including a card deck, a cribbage board, and an informative history. #04601

The Family Card Games

Three more card games from the makers of The Solitaire DA. This new product contains War, Solo and Canfield. #04602

\$59

\$49



SPECTRUM HOLOBYTE

Falcon v2.2

When you climb into the cockpit of the F-16 Fighting Falcon, get set for the "flight of your life" as the powerful FALCON takes you streaking across the sky at Mach 2. Pit your skills against those of your friends. Find out who is the real "top gun"! #01808

\$34

Vette!

Vette! puts you behind the wheel of America's premier production sports car in the streets of San Francisco! Pit your racing skills against top European sports cars. Comes equipped with all those driving nuisances (like pedestrians, trucks, police, taxis and traffic jams!) #03808



\$32

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ACCOLADE

Grand Prix Circuit

The ultimate fusion of car and driver. Experience the power. The Passion. The Performance. Grand Prix Circuit whisks you to the exclusive world of Formula One racing. Slither and slide through the curves of glamorous Monaco. Blast down the straightaways of Germany. You'll compete against international rivals for the title of World Driving Champion. #02757



\$34



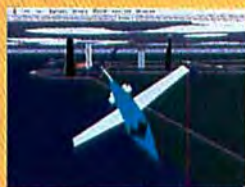
MICROSOFT

Flight Simulator V 4.0

The new Flight Simulator boasts state-of-the-art, three-dimensional graphics on both color and black-and-white Macintosh computers. Users can choose from a fleet of aircraft, including Cessna 182, Lear Jet, Sopwith Camel and Schweizer

2-32 sailplane. Or, they can design and fly their own planes with the exclusive experime

tal aircraft designer. Users can tinker with both the appearance and aerodynamics of the aircraft and test them against the physical laws of flight. The Flight Simulator world encompasses 100 million square miles, spanning most of North America. Desktop pilots can take off from or land at 125 different airports and explore detailed scenery and landmarks in Los Angeles, San Francisco, Seattle, Chicago, and the Boston-New York corridor. #04293



\$39



KRAFT SYSTEMS KM30 Joystick

Whether handheld or positioned on your desktop, the KM 30 makes computer input and productivity better than ever. Macintosh ADB compatible, a precision analog joystick to meet all your needs. Great for graphics, business, education, and entertainment software. #01990

\$44



MICROLEAGUE Baseball II

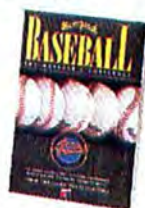
Baseball II features real-life players and accurate stats. You coach actual major leaguers by setting up lineups, picking your spots for pinch

hitters and relievers, deciding when the players will steal, bunt or do a pitchout - in short, make every managerial maneuver in every game. #02923

\$37

The Manager's Challenge

It's the bottom of the ninth, one out, and your pitcher has the tying run on second, the winning run at the plate. The opposing team has put in their best right-handed pinch hitter and he looks confident. Your managerial skills are the key to winning this game. #04259



\$28

THREE SIXTY SOFTWARE Armor Alley

Armor Alley is hot, and it gets hotter with every battle. Through the rattle of machine guns and a searing flood of napalm, your job is to lead convoys of equipment and men through the enemy's lines and destroy his base. To succeed, you must keep your wits about you despite the constant explosions and gunfire. #03597



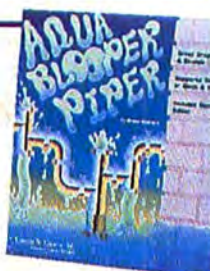
\$33

CASADY & GREENE

Aqua Blooper Piper

You must either select pipe pieces from a conveyor belt and fit them together properly, with no errors (bloopers), to connect two open pipes on the opposite ends of a basement - or have the same basement fill with water (aqua). The game's editor allows you to choose favorite sounds and graphics. #04581

\$29



CASADY & GREENE

Glider 4.0

The game's theme revolves around an eerie mansion and a paper airplane. A player tries to fly a glider from room to room and get past numerous and varied obstacles, including toasters, paper shredders, electric wall sockets, and fish jumping out of their bowls. The idea is to fly through all 60 different rooms and the out of the house. If you master the game, the Room Editor allows you to create your own version of obstacle-filled rooms. #04580

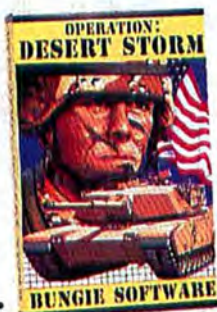
\$29



BUNGIE SOFTWARE

Operation: Desert Storm 1.5

Join the Forces in the Gulf in this realistic full color battle simulation! Experience full screen action on any monitor as you command your M1A1 Abrams tank on a series of missions against a hostile, well-equipped enemy. #04106



\$27

BADY & GREENE
Game Fun
undle™
 stal Quest with
 terEditor received a
 \$9 Eddy Award from
 cUser and a 5 Mice
 ing from MacUser.
 Shadow was entered
 MACWORLD's 1990
 ne Hall of Fame for



59 Best Arcade Game. Mission
 Starlight received a 4 mice
 rating from MacUser.
 #04582



ADVANCED GRAVIS MouseStick

For entertainment it's the high-scoring MouseStick. Its advanced optical technology and dedicated processing unit are ideal for flight simulators or mouse-intensive entertainment software. Includes custom settings for popular games — or you can create your own.
 #02740

\$58

#02741 Joystick \$58



DELTA TAO Strategic Conquest 3.0

One of the best
 military strategy
 games for any personal computer.
 You control the production and movement
 of your armed forces in a struggle against
 an enemy bent on world domination. The
 fate of the world
 depends on your
 strategic and
 tactical decisions.
 #04083

\$37



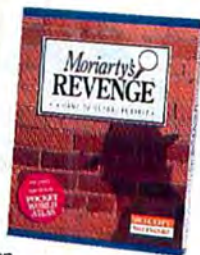
DELTA TAO Spaceward Ho!

Spaceward Ho! is a
 strategic game of
 awesome scope.
 You control the entire
 military and economy of a spacefaring race.
 Your goal: Explore and colonize the galaxy.
 Unfortunately, you are not alone. Alien
 enemies bent on galactic conquest oppose
 your expansion. You maneuver your
 spaceship fleets, both in
 defense of your own
 systems and in offensive
 strikes. #04116

\$37

MYSTERIUM TREMENDUM Moriarty's Revenge

The infamous
 Dr. Moriarty is now
 leader of a world-wide
 crime organization and
 you must track him down.
 You'll travel the world, taking notes, puzzling
 over clues and trying to stay alive. Over
 1,000 clues and a computerized
 notebook to keep them in.
 With varying levels of difficulty,
 it's never the same game twice.
 #03290



\$31

GREAT GAMES FROM INLINE DESIGN



Swamp Gas

Swamp Gas is an
 animated color game
 that teaches United
 States geography. An
 extraterrestrial lands in
 America and must visit
 a number of states,
 cities, and landmarks. After he completes
 his mission, the player may visit the Alien
 Arcade and play one of
 three uniquely humorous
 and quirky arcade-style
 games. #04251

\$32



Mutant Beach

Mutant Beach is a
 fully-animated, full-
 color interactive action
 adventure game,
 starring Native Nick, a
 laid-back islander.
 Nick must overcome
 amusingly mutated creatures, along with
 traps, false paths, and locked gates, to
 return the stolen nose to
 his island's idol. Detailed
 flicker-free 8-bit animation.
 #04252

\$44



Tesseract

Tesseract is a color
 puzzle game in which
 the player eliminates
 tiles from a "board"
 according to color and
 texture. When only
 one tile remains on the
 board, a different,
 more difficult
 arrangement appears.
 #03934

\$31



3 in Three

3 in Three is an
 animated color puzzle
 game. A number 3 has
 become lost inside the
 CPU of a computer, and
 she wants to find her
 way back to her
 spreadsheet. To help
 her on her way, the
 player must solve a
 score of original brain-
 teasing puzzles.
 #03599

\$32

SOFTWARE TOOLWORKS Chess Master 2100

"The 2100" offers
 stronger and more
 varied play with an
 unlimited number of levels (from
 an "easier" easy to a "tougher" tough),
 triple the number of features, more and
 different classic games
 and even greater in-depth
 analysis.
 #02651



\$32



XOR MacGolf Classic

MacGolf Classic offers
 vivid full-screen color
 graphics with
 unmatched screen
 image detail. Five
 enlargement
 options for close-up viewing. Nine
 practice greens and a driving range. Control
 your stance, ball
 placement, shot
 direction, swing,
 choice of 14 clubs.
 #01984

\$49

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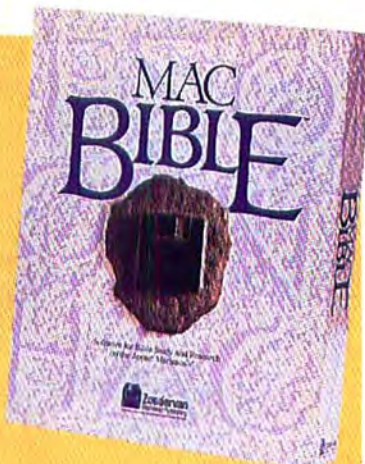
ZONDERVAN MacBible New International Version

Zondervan MacBible presents several different versions of the Bible to help you understand its meaning more clearly. It quickly finds the passage you want.
#00016

\$78



#00017 King James\$78 #00021 Greek\$109
#00018 RSV\$78 #00023 Hebrew\$109



BRØDERBUND Where In Time Is Carmen Sandiego?

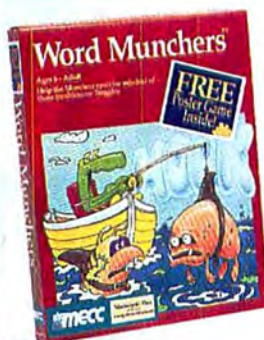
Chase Carmen and her gang through 1500 years of world

\$28

history picking up clues on historical events, scientific inventions and famous people.
#03513



MECC "MUNCHERS" MAKE LEARNING FUN!



MECC Word Munchers

Learn vowel sounds the fun and easy way - with Word Munchers! Chase your Muncher around the gameboard, gobbling up words with the same vowel sounds.
#00073

YOUR CHOICE

\$28



MECC Super Munchers

Learn fascinating facts in a variety of subjects - animals, famous Americans, food and health, geography, music, odds 'n' ends, and

sports - in this challenging, fast-paced game! #00500



MECC Number Munchers

Munch your way to math mastery! With the Muncher's help, you'll learn basic math skills the fun and exciting way. It mixes amusing

graphics and sounds with practical math skills. #00072

KNOWLEDGE REVOLUTION

Interactive Physics 1.2.2

The easy to use, yet surprisingly powerful physics laboratory on a computer. Measurement devices include numerical readout, analog display and graphing capabilities for 16 different physical properties.
#00260

\$188



INTERPLAY Dvorak On Typing

Dvorak on Typing is the first major typing program to feature a human voice that sounds out the letters as you type, helping you to become confident with touch typing.
#04256

\$31



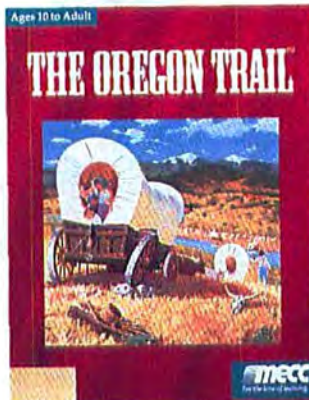
EARTHQUEST, INC.

Ecology

Explore the major ecosystems on Earth. Learn about the vital relationships and cycles that sustain all life. Enjoy many engaging and educational games as you journey through ecology. #04578



\$41



MECC

The Oregon Trail

Players load up their gear and hit the trail with other pioneers in this realistic award-winning learning simulation. While they experience the life of the American frontier along the 2,000 mile route, players talk with colorful characters, navigate rushing rivers, and meet friendly Native Americans. And their families depend on them to make crucial decisions at every turn.
#00074

\$28

The Mac
Zone
Established 1980



LEARN
SEARCH

Mathematica Enhanced V2.0

Numbers are your business, Mathematica does numerical, symbolic and graphical computation. It can be used as an interactive calculation tool and programming language. Numerical capabilities include arbitrary precision, arithmetic and matrix manipulation. Mathematica 2.0 can manipulate formulas directly in algebraic form, perform such operations as symbolic equation solving, integration, differentiation and power series expansion. Produces two- and three-dimensional PostScript graphics.

\$789

HYPERGLOT Survival Manual

An electronic phrase book. Program is divided into topics of interest to travellers: Greetings, Hotels, Food, Clothing, Communications, Transportation, Health, etc. Each topic contains about 25 recorded phrases. User clicks on phrase, hears native speaker pronounce it, and sees a translation. Extensive notes available about the topic being studied. Many other phrases besides the recorded ones available for each topic. A Phrase Finder allows user to find the phrase he/she wants to hear. **STANDOUT FEATURES:** If user has MacRecorder, he/she can record your own voice right into stack and then compare his/her pronunciation of the phrase with that of the native speaker. Sounds thus recorded can be renamed and erased.

#04234 French #04235 Spanish #04236 German



YOUR CHOICE

\$39

GREAT GIFTS FOR KIDS!



Math Rabbit

Here's another delightful way to teach early-learning skills. Math Rabbit's animated graphics and lively music

encourage young children (ages 4 to 7) to explore the world of numbers. In four enticing games, children can learn counting, number, and pattern recognition, addition, and subtraction.

\$35

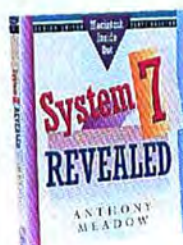


Talking Reader Rabbit 3.0

Reader Rabbit builds early reading skills for kids from age four to seven. It uses lively graphics, plus delightful sound effects, music and speech to capture

kids' interests. Reader Rabbits has four carefully-sequenced games to teach children how to recognize, remember, and spell over 200 three-letter words. #01856

\$35



ADDISON-WESLEY System 7.0 Revealed

Written by Macintosh authority, Anthony Meadow, System 7.0 Revealed offers programmers a first look at System 7's many

new features and shows how to take full advantage of these features in developing Macintosh software. Other books in the acclaimed Macintosh Inside Out Series and the Apple Technical Library, including Inside Macintosh Volume VI, can be found in the index. #00250

\$18



TRUE BASIC Algebra, Pre-Calculus & Calculus

When pencil and paper aren't enough, reach for the Kemeny/Kurtz Math Series. These best-selling math packages help you organize your thoughts, understand key concepts, step through examples, and solve real problems.

\$39

527 Algebra
529 Pre-Calculus
530 Calculus

YOUR
CHOICE

ABACUS StatView II

StatView II is a comprehensive statistical analysis and presentation graphing program for the Macintosh. StatView II places analyses in a fully interactive presentation-quality graphing environment where results may be easily customized using drawing and text tools. StatView II will output to any Macintosh-compatible black-and-white or color printer, plotter, or slidemaker. #00032

\$278



SuperANOVA

SuperANOVA is a complete general linear modeling program for the Macintosh. SuperANOVA analyzes virtually any model, including ANOVA, ANCOVA, MANOVA, MANCOVA, repeated measures, and more. With SuperANOVA you can create, modify and save model designs, as well as annotate them in a complete, interactive drawing environment.

\$308



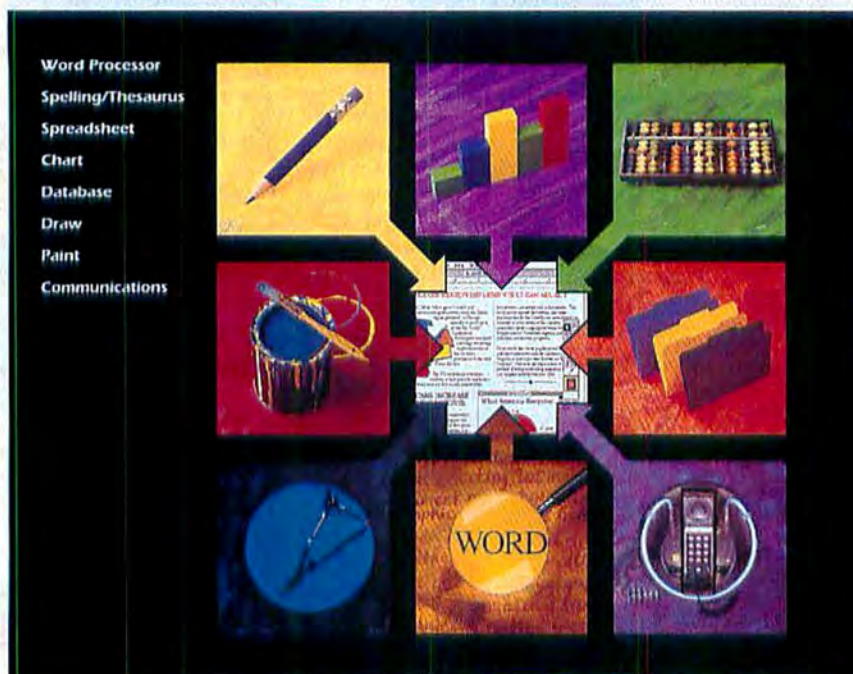
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For the Macintosh

BeagleWorks™

The true meaning of integration.



Word Processor
Spelling/Thesaurus
Spreadsheet
Chart
Database
Draw
Paint
Communications

BEAGLE BROTHERS

BeagleWORKS

This new, integrated program offers a full-working word processor with spelling checker and thesaurus, spreadsheet with charting, database, paint, draw and communications modules all in one package. Its true integration, lets you combine data from all other modules into a single document and make changes (edit in context) without leaving that document.

#04327

\$184

BeagleWORKS Competitive Upgrade

\$99 Upgrade - if you have AppleWorks 3.0, AppleWorks GS, Microsoft Works, Desk, Ragtime, GreatWorks, or ClarisWorks. Send in a copy of the front cover of your manual with the Beagle Brothers registration card in order to become a registered owner and be eligible for updates and tech support. Nothing needs to be sent to Mac Zone. #04555

\$99

WORD PROCESSOR

- ▲ Automatically wrap text around objects
- ▲ Format in multiple columns
- ▲ Graphic ruler with tool bar for quick formatting
- ▲ Multiple headers and footers, custom styles and more
- ▲ Micolitics® spelling checker and thesaurus

SPREADSHEET

- ▲ Apply a different type style to any cell
- ▲ Create up to 256 columns and 16,385 rows
- ▲ Tool bar allows easy access to formatting, alignment, borders, shading and charting
- ▲ Incorporates powerful and time-saving natural order minimum recalc

CHART

- ▲ Chart types include Line, Bar, Column, Area, Scatter, Exploded Pie and more
- ▲ 256 custom colors



DATABASE

- ▲ Manage databases with more than 16,000 records per file and 256 fields pre record
- ▲ Mail merge with word processor
- ▲ 64 built-in functions
- ▲ Up to 32 report formats for your data
- ▲ Tool bar provides easy access to formatting and alignment, borders, shading, sorting, and summation

DRAW

- ▲ Tear-off menus for tools, colors, patterns and line widths
- ▲ Drawing tools include line, arc, rectangles, freehand, polygon, oval and more
- ▲ 256 custom colors and 128 patterns

PAINT

- ▲ Paint tools include paintbrush, spraycan, paint bucket, pencil, line, arc, freehand shape and more
- ▲ Tear-off menus for tools, colors, patterns and line widths
- ▲ Special effects
- ▲ Paint color images using 256 custom colors and 128 patterns

COMMUNICATIONS

- ▲ Stores commonly used phone numbers with settings
- ▲ Auto dial and auto answer
- ▲ Uses Apple's Communications tool box

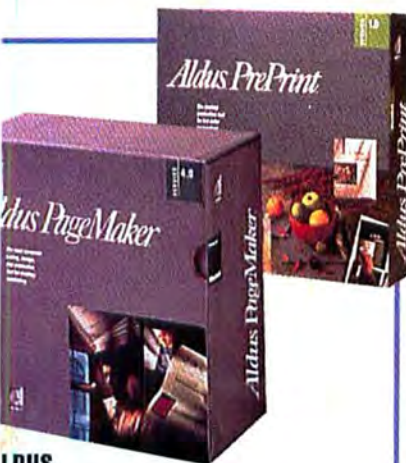


T/MAKER

SmartBundle

total solution for first-time Macintosh users. A collection of four easy-to-use applications in one bundle at an incredible price - the best value in Macintosh software today! Each application has won MacUser Magazine Eddy Award recognizing it as the 'best' in its field, so you know each part of the SmartBundle is extraordinarily capable. The SmartBundle contains WriteNow 2.2, T/Maker's award winning word processor. Full Impact 2.05, for spreadsheets and charts. Recorder Plus for database management and SuperPaint 2.0, for painting and drawing.

\$149



ALDUS PageMaker & PrePrint Bundle

The PageMaker 4.2 package will include PrePrint 1.5, a color-production tool that enables users to enhance and color-correct TIFF images, as well as generate color separations of multipage documents, including text, illustrations, and color photographs. PrePrint can separate and print PageMaker files and any Postscript file that conforms to Adobe systems' color-separation and document-structuring conventions. It also creates, recognizes, and prints DCS (Desktop Color Separations) files.

#00042

\$498



RAGTIME

RagTime 3.1

RagTime is the ideal tool for all private or office documents on Apple® Macintosh™ computers. RagTime represents a completely new way to work in an integrated environment that offers all the tools that you need for your daily work:

Do you need a Desktop Publishing program? Here's a little secret: Even though RagTime is not a dedicated DTP program, it does most DTP tasks with such elegance and ease that it quickly became a DTP standard in Europe after its introduction.

#04055



\$369



MICROSOFT Office V1.5

Four essential business-productivity applications in one special edition. Each is an industry standard in its category: word processing, spreadsheet, desktop presentations, and electronic mail. Use Microsoft Word to write memos and reports; Microsoft Excel to crunch numbers and create annual-report-quality graphics; Microsoft PowerPoint program to create impressive presentations; and Microsoft Mail to instantly share information.

#02678

\$519



SYMANTEC GreatWorks Upgrade

Any owner of MS Works or AppleWorks can now step up to New GreatWorks' eight feature-rich applications in a single, easy-to-use integrated program. Get full word processing database, spreadsheet, charting, drawing, painting, outlining and communications modules. Includes a 100,000 word spell checker and 660,000 word thesaurus. It runs in less than 1 MB of RAM, perfect for Macintosh classic on up. #04040

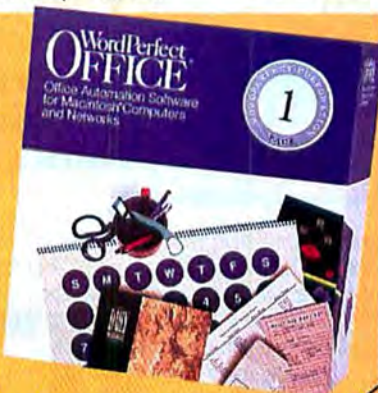
\$99

WORDPERFECT

WordPerfect Office

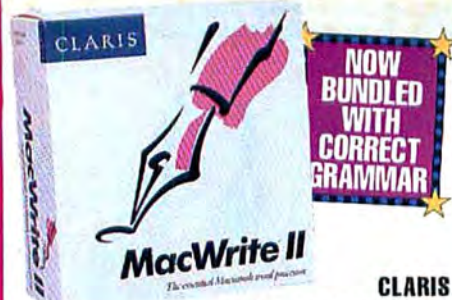
WordPerfect Office™ for the Macintosh® is a collection of office automation programs for Macintosh networks. The programs in Office include Mail, Calendar, Notebook, File Manager, and Forms Maker. The desk accessories allow you to send electronic mail, schedule events and resources for people on the network, create databases, and organize your desktop. The Forms Maker application lets you create forms for use in Mail, Calendar, and Notebook. In addition, Office includes gateway services to communicate with other WordPerfect Office platforms and third-party electronic mail systems. #04170

\$92



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CLARIS MacWrite II

Create a variety of documents. MacWrite II® software gives you all the tools you need for a wide range of writing tasks, from simple memos and reports to sophisticated business proposals, multi-column newsletters, and 1,000 page manuscripts. Check your spelling with the built-in 100,000-word dictionary. Or find just the right word with the 220,000-word desk-accessory thesaurus. Read, edit or insert files created in other word processors like MS Word or WriteNow. #04703

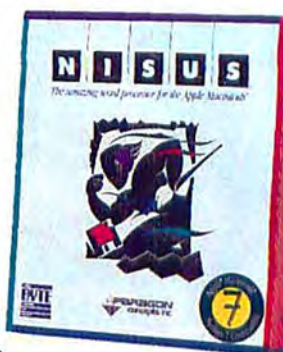
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WORDPERFECT WordPerfect 2.02

If you've been waiting for a word processor for your Mac that combines power and elegance, the wait is over. We've designed a brand new interface with an eye toward simplicity. Compact, easy-to-understand menus and streamlined dialog boxes give you access to all the WordPerfect features you're used to and many exciting new additions.

#03972

\$278



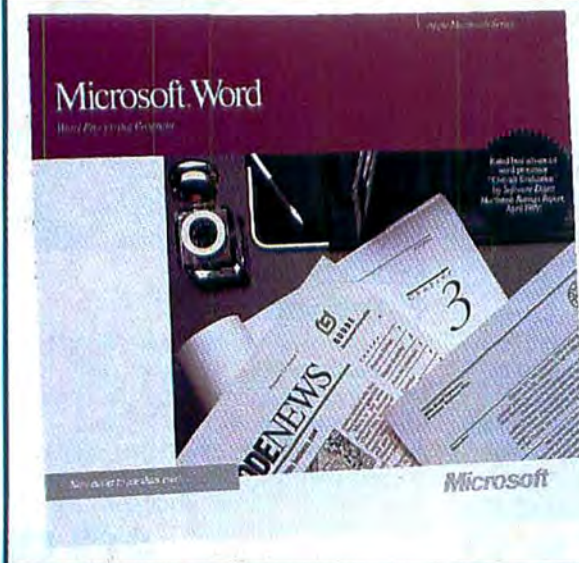
PARAGON Nisus

The breakthrough is here. There is no other word processor on the market as powerful, fast or easy to use as NISUS. Which one, the click of the mouse: Lets you draw a picture right over the text? Makes it transparent or opaque? Lets text flow through or instantly wrap around it? Allows you to undo more than 32,000 text or graphic actions? None but NISUS.

#03479

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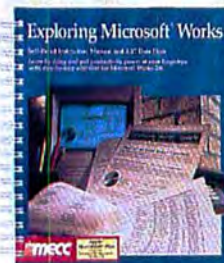


MICROSOFT Word 4.0

Design pages with different number of columns on the same page. Place sidebars exactly where you want them. Automatically wrap text around graphics. Tables are a breeze. Just enter the number of rows and columns you need and Word generates your table with automatic text wrap within cells. Word 4.0 even has facilities for creating mathematical formulas. It has a spelling checker, hyphenation, style sheets, a glossary, automatic indexing, mailmerge and an integrated outline. Coupled with a connectivity program such as MacLink, Word 4.0 on the Mac is compatible with the MS-DOS version of Word and with PageMaker (both Mac and PC versions) so you can exchange files among all these formats.

#02238

\$244



MECC Exploring Microsoft® Works

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These training

materials will help you learn to use Microsoft Works 2.0, one of the most popular software packages ever published for the Macintosh.

Easy-to-follow
activities and sample
document files
on disk.
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T/MAKER Holiday Bundle: WriteNow 2.2, Grammatik Mac, & Mac Tools

Never has so much
value been delivered at
such a low price.

WriteNow, two-time winner of the prestigious MacUser Eddy award for word processing, now comes with Grammatik Mac 2.0, the best selling Grammar/style checker (a \$99 value) and MacTools Deluxe, the data protection and file management utility, (a \$129 value) FREE WriteNow, containing a 1.4 million word thesaurus and 135,000 word dictionary is still the fastest and easiest word processor for the Mac.

#04465

\$99

INTERNATIONAL ORDERS ACCEPTED

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EFFICIENCY
SOFTWAREReport
Ideas DA

Report Ideas gives you the power to create massive, hard hitting reports. Yet it's as intuitive as the Mac itself. Selecting a topic in the Ideas menu brings down the available phrase window. Each phrase listed in the window is made up of several word groups. Each word group has its own pop-up menu of alternatives. In this way, the user can quickly skim through the different connotations of the phrase and choose the most appropriate. #04176

\$78

Correct Grammar

For the Macintosh

If you love your spelling checker, you'll love this software checker.



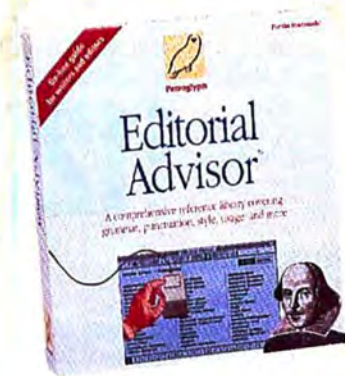
WRITING TOOLS GROUP

Correct Grammar

Correct Grammar is an easy way to avoid embarrassing mistakes in letters, reports and proposals. It makes your writing clearer and more precise. It identifies inconsistencies in grammar, style, punctuation, usage and spelling (with its own 135,000-word dictionary), and then suggests how you might correct any errors. #03813

\$49

04607 American Heritage \$89



PROGLYPH

Editorial Advisor

It's not a grammar checker. Editorial Advisor is a computerized style manual that covers grammar, punctuation, style, usage and more. Learn the conventions of editing. Give your writing that professional edge.

With System 7.0 you can install Editorial Advisor on your DA menu. It's like having a reference library on your hard disk. #03944

74

PERSONAL BIBLIOGRAPHIC SOFTWARE



Pro-Cite 2.0

A powerful database program that saves you hours of time by enabling you to manage and format bibliographic and text information automatically. New features include instant searching, expanded word processing support, and increased record capacity. #01892

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Biblio-Links

Companion programs to Pro-Cite, each program transfers records down-loaded from online services, CD-ROM and disk-based data products directly into Pro-Cite. #04310

\$98

Pro-Search

A specialized front-end software program that simplifies searching of DIALOG databases. Pro-Search's unique, menu-driven interface helps you select the most useful database to search by providing bluesheet data on disk. Save time and money by constructing and storing search strategies offline. A built-in accounting feature tracks online charges automatically. #04266

\$149

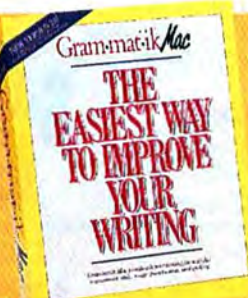


WORKING SOFTWARE

Last Resort

Last Resort is an all new utility to help you retrieve typing lost by system crashes, failures to save, deletions or other unfortunate circumstances. Last Resort saves every keystroke to a file on your hard disk without slowing your typing. Lost text can be retrieved using any word processor. #04061

\$28



REFERENCE

Grammatik Mac 2.0

Grammatik Mac improves the quality and clarity of your writing. It checks for common grammatical and stylistic errors, clichés and jargon, commonly misused words, and long-winded sentences. It also looks for incorrect capitalization, subject/verb disagreement, double negatives, excessive use of passive voice, split infinitives and many other typical writing problems. #03143

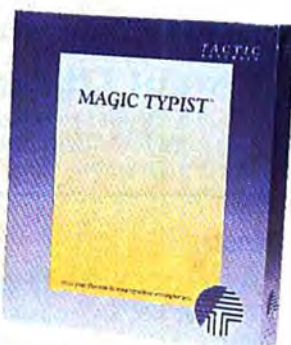
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TACTIC

Magic Typist

Magic Typist™ is a utility which works with any application to relieve you of the chore of typing long words, phrases, and paragraphs over and over again. Type it only once and you'll never have to type the whole word or phrase again. Thanks to Magic Typist. #03405



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QUE RightWriter

RightWriter makes your writing clearer, more concise, and powerful. RightWriter proofreads documents for thousands of errors in grammar, style, word usage, and punctuation. RightWriter works with major Macintosh word processors and all standard text files. RightWriter uses more than 4,500 rules to proofread documents, inserting comments and suggestions where errors occur and analyzing documents for strength, readability, and jargon. #04597

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INDIVIDUAL ResumeMaker

Individual's ResumeMaker helps you quickly get on the right track for the job you want. It's easy to use; simply fill in on-screen information forms with your experience, education and skills. It then automatically transforms this into a winning, professional-looking resume. Includes varied resume formats, Guided Letters, a full word processor, target company database and much more. #00432

\$29



FRANKLIN ELECTRONICS Language Master

Language Master combines an electronic dictionary of definitions with an electronic thesaurus, giving you access to words, definitions and synonyms which will help effectiveness of your communications. If your query word is misspelled, Language Master will suggest a list of alternative words. With the help of the computer, a single unified reference work is possible and is available in Language Master. #00010

\$44

WRITING TOOLS FROM NOVA DEVELOPMENT



American English Writing Guide

It's the complete reference to style, punctuation, and better writing for the Macintosh. You'll find rules and examples for a variety of writing topics, from capitalization to punctuation, spelling to bibliographies. #04263

\$38

American Handbook of Business Letters

Save time and money with nearly 300 instant letters for every business occasion from congratulating a business associate to collecting on past-due accounts. Just add a date, name, address, and you're ready to print! #04261

Instant Library of Quotations

This program gives you fast access to more than 5,000 contemporary, literary, and historical quotations, right from your Macintosh keyboard. Each one can provide a solid foundation for making any point. #04262

YOUR CHOICE

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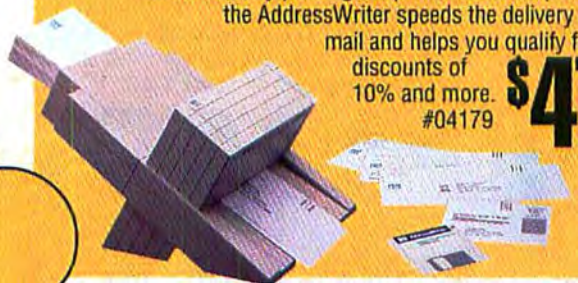
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AddressWriter™

Finally, an easy way to print envelopes and postcards! The AddressWriter is the first printer designed specifically to print envelopes and postcards, either one at a time, or by the hundreds.

In addition, by printing the postal bar code (POSTNET), the AddressWriter speeds the delivery of your mail and helps you qualify for postal discounts of 10% and more. #04179

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BASELINE PUBLISHING Thunder 7

Thunder 7™ is total word mastery for your Mac, providing both true interactive spell checking as well as a completely integrated thesaurus. Using the glossary feature, misspelled words, personal abbreviations and terms automatically correct themselves as you type. Using Thunder 7's utility program, your existing users' dictionary can be quickly included into the program library of words. #03941

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FOR
PageMaker®

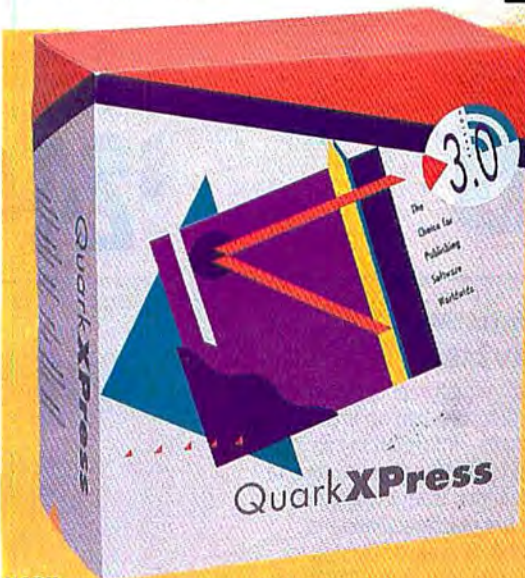
INDIVIDUAL

Training for
PageMaker 4.0

Takes you through a series of step-by-step on-screen lessons which teach you to take full advantage of PageMaker 4.0. Users will learn document and file concepts, use of fonts, sizes and formats, page set-up and printing, utilizing section options, and creating style sheets. Includes

checking and hyphenation, creating an index, tables and footnotes, using print merge, creating custom menus, preferences and learning the ins and outs of the trade. #03758

\$29

QUARK
XPress 3.0

XPress 3.0 boasts a more intuitive user interface, many new features, plus redesigned and reorganized documentation. New measurement and page palettes provide the user with interactive on-screen access. A library stores frequently-used items and a pasteboard provides a work area next to each page. You can group text and graphics as single elements and rotate them a full 360 degrees in .001 degree increments. Color trapping ensures precise color printing. #03488

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RASSET

Ready, Set, Go! 4.5

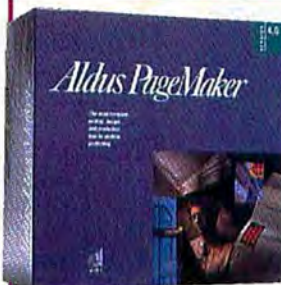
Ready, Set, Go! has all the desktop processing functionality you need including multiple document windows, powerful typographic tools (such as control of leading, font size, and baseline shift to .01 point), as well as drawing tools and color capabilities including PANTONE color specification)

Ready, Set, Go! also features interactive facing pages, a true WYSIWYG display, and five levels of page magnification. It's a great combination of value and performance. #01370

164



DTP POWER FROM ALDUS



ALDUS

PageMaker V4.01

PageMaker 4.0 goes beyond the paste-board metaphor that made the original PageMaker a smash hit. New features include a blindingly fast Story Editor, extended support for color, the ability to rotate text, a built-in dictionary and a spell checker. Files can have up to 9999

pages in length and multiple files can share a common index. You also get much more sophisticated type control, including the ability to adjust the look with point-sized dependent kerning on any text in increments of .01 point and a condense/expand range of 5% to 250%. #03223

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Personal Press

Personal Press is for people who want the power of publishing with a minimum investment of time and money. A page layout program with a full-featured word processor and powerful graphics capabilities, Personal Press includes all the

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features you need for nearly any desktop publishing task. Helpful visual previews and on-line help. #03880



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Effects Specialist

Transforms bit-mapped, PostScript or True Type fonts into sparkling headlines or eye-catching

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logos. Type in a word or two, and select the desired effects and options. Features like WYSIWYG display, color support, skew, rotate, kern and a complete background generator are included. Imports/exports PICT or EPS Files. System 7 compatible. #04049



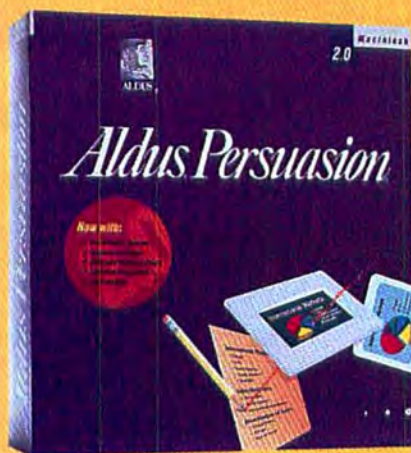
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Output camera-ready, professionally designed documents instantly! Layouts contain a variety of templates for all your business needs, including: 33 brochures (2,3 & 4 panel), 14 newsletters (1,2 & 3 columns), 82 business cards (horizontal, vertical bookfold, gatefold, shortfold horizontal and vertical, tent evenfold and tent viewfold styles), 35 letterheads, 48 envelopes, 2 business reply cards and 5 flyers. Also available are additional flyer & stationery packs. #04086

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ALDUS Persuasion 2.0

Let Aldus Persuasion 2.0 do all the work of developing presentation graphics. Select one of the predefined templates (or create your own), and type your ideas into the outliner. Persuasion automatically prepares your slides from the outline. Version 2.0 has a larger template library, and its AutoTemplate function enables you to preview, combine, or change template designs at will. Persuasion provides a variety of predefined charts and graphs (or you can create your own). It automatically generates

speakers' notes and handouts. You can use the slide show mode (with 15 different wipe and dissolve effects) for your presentation, or for a self-tuning demo. Persuasion includes drivers for the most popular printer and film recorders. #02424

\$328



MICROSOFT PowerPoint 2.01

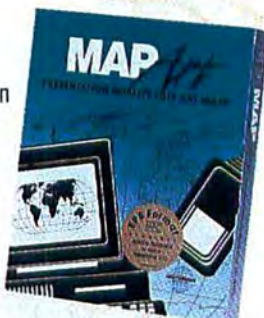
Presenting Microsoft PowerPoint for the Macintosh. PowerPoint comes with WYSIWYG technology - create slides or overheads directly on screen. Use the built-in graphing tool to create business charts. A new breed of desktop presentations software that lets you create the most unforgettable presentations you - or they - will ever see. #01220

\$244

MICROMAP SOFTWARE

MapArt

MapArt is the most comprehensive collection of clip art maps available for the Macintosh. Created by professional cartographers, MapArt includes detailed maps of every region in the world. MapArt lets you create customized maps quickly and easily. You simply open a MapArt file with your graphics program. Then use the tools in the program to customize the map. Add fill patterns, graphic objects, drop shadows, text and numbers. Then bring the map into a desktop publishing or presentation program. #04356
#04355 MapArt: MacPaint \$39
#04357 MapArt: PICT \$89



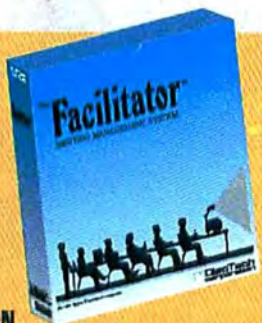
\$89

NEWTON TECHNOLOGY GEOvista

GEOvista™, a geographic presentation system, displays data on presentation-quality maps. Information can be imported from other applications or entered directly from the keyboard. Areas of the map are shaded to represent data ranges selected by the user. Included with GEOvista are 52 template maps, one for each of the 50 states subdivided by county, maps of the U.S. subdivided by state and much, much more. #00226



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The Facilitator™ means instant meeting efficiency and effectiveness. All aspects of meeting management are provided: Logistics, Purpose, Desired Outcomes, Attendees, Electronic Agenda with timekeeper, Action Items, Notes and more. Problem solving tools include Brainstorming, Bucketing, Fishboning, and Pareto Analysis. Attendees will be able to depart with meeting minutes in hand! #04550

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SYMANTEC More 3.1

Use More 3.1 to organize and prepare your next presentation. It will even run your slide show for you. You can start by typing your thoughts into the Outliner, and then More help you organize them when your ideas start to gel. With More, it's easy to import clip art to illustrate your point, or you can create your own with More's drawing tools. Add some of More's dazzling charts and graphs to bring your data to life. When you're finished, More will print out overhead transparencies, 35mm slides (overnight through Autographix Service Center), and professional looking audience handouts. #04464



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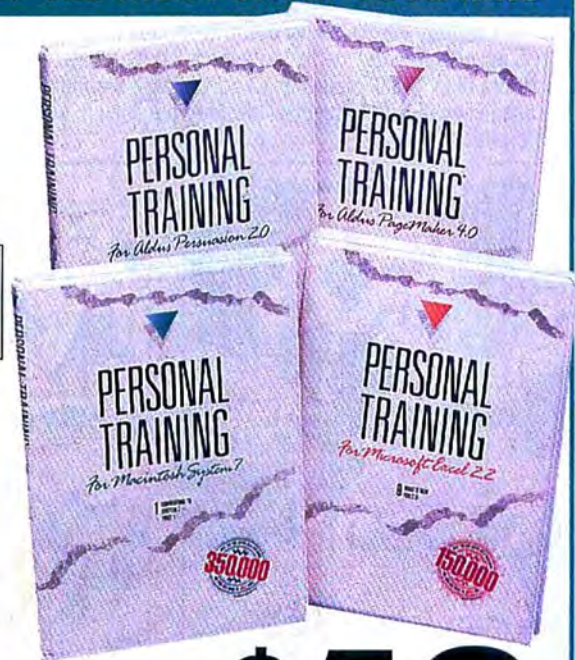
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Tutorials

These award-winning tutorials are just like having your own private tutor. You use the real software as instructors talk you through step by step. They're audio-based, self-paced and modular. Choose the most suitable level: beginning, intermediate or advanced. Each module takes 90 minutes, includes an audio cassette, example files on disk, and a quick reference card. Products include tutorials for PageMaker, Persuasion, Excel, QuarkXpress & System7.

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| #3044 B2 The Basics (Mac Plus Or SE) | #3055 P1 Beginning Aldus Pagemaker 4.0 |
| #3045 B3 The Basics (Mac II) | #3056 P2 Intermediate Aldus Pagemaker 4.0 |
| #3046 B4 Beyond The Basics | #3057 P3 Tips For Aldus Pagemaker 4.0 |
| #4294 C1 Converting to System 7-Part 1 | #3058 P4 Advanced Aldus Pagemaker 4.0 |
| #4725 C2 Converting to System 7-Part 2 | #3383 P5 New Part I Aldus Pagemaker 4.0 |
| #3059 Fh1 Beginning Aldus Freehand | #3384 P6 New Part II Aldus Pagemaker 4.0 |
| #3060 Fh2 Intermediate Aldus Freehand | #3783 Q1 Beginning Quark Xpress 3.0 |
| #3061 Fh3 Special Fx Aldus Freehand | #3784 Q2 Master Pages Quark Xpress 3.0 |
| #3062 Fh4 Precision Aldus Freehand | #3785 Q3 Text Formats Quark Xpress 3.0 |
| #3075 Fm1 Filemaker Creating Datab | #3786 Q4 Color & Type Quark Xpress 3.0 |
| #3076 Fm2 Filemaker Beg. Layouts | #3787 Q5 Tips & Techniques Quark Xpress 3.0 |
| #3077 Fm3 Filemaker Adv. Layouts | #3051 W1 Beginning Level Word 4.0 |
| #3078 Fm4 Filemaker Tips And Techniq | #3052 W2 Intermediate Level Word 4.0 |
| #3923 Fm5 Advanced Features Filemaker Pro | #3053 W3 Advanced Level Word 4.0 |
| #3067 Lp1 Beginning Aldus Persuasion | #3054 W4 Additional Features Of Word 4.0 |
| #3068 Lp2 Intermdat Aldus Persuasion | #3034 X11 Beginning Spreadsheets For Excel V3.0 |
| #3069 Lp3 Templates Aldus Persuasion | #3035 X12 Intermediate Spreadsheets Excel V3.0 |
| #3070 Lp4 Artwork Aldus Persuasion | #3036 X13 Advanced Spreadsheets Excel V3.0 |
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| #3072 M2 Advanced Database For Works | #3038 X15 Building Databases Excel V3.0 |
| #3073 M3 Spreadsheets For Works | #3039 X16 Beginning Macros Excel V3.0 |
| #3074 M4 Word Processing For Works | #4729 XLP Powerful Spreadsheets |
| #4726 N1 Getting Started | |
| #4727 N2 Using the Mac Interface | |
| #4728 N3 Advanced System Features | |



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ONLINE ARTS ClipArt Business Images

Business Images includes over 160 high quality, ready to use PostScript clip art graphics. You can have professional quality artwork to enhance your business publications, newsletters, brochures, advertisements, memos or any printed piece. This package includes images most requested from professional artists including: people, computers, equipment, symbols, words, phrases, backgrounds and much more.

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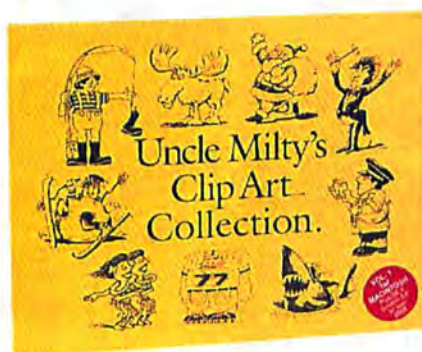
Puts Fun in your work!

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You'll enjoy using this light-hearted collection of well over 400 hand drawn images. Use MacGallery with any PAINT program or with HyperCard. Excellent clip art for ImageWriter users!



UNCLE MILTY'S ClipArt Collection

Use Uncle Milty's Clip Art and your newsletters, ads, flyers, invitations, brochures, memos, etc. will be more inviting, pleasant and fun to read! One hundred, HI-RES 300DPI, illustrations on three disks, hand-drawn by Uncle Milty & Friends! Use with Pagemaker®, Quark Express®, and other popular page layout programs that import TIFF! #04273

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REAM MAKER SOFTWARE

Cliptures

outstanding artwork at only pennies per drawing! Each Cliptures volume gives you a wealth of: Dynamic illustrations perfect for all kinds of projects. Versatile, ready-to-use artwork that's faster and easier than creating your own graphics from scratch. High resolution EPS images that look great even when they're enlarged, reduced, or stretched. Cliptures works with any software program that accepts EPS (Encapsulated PostScript) files. A PostScript compatible printer or interpreter program is recommended for best results.



Volume 1: Business Images

Gives you 148 terrific business illustrations including a wide selection of male and female executives and a variety of tantalizing business cartoons, graphics and symbols. #03998



Volume 3: Sports

Puts 228 fantastic sports images at your fingertips. Includes lots of men and women athletes and a rich collection of other outstanding sports graphics, symbols and icons and more. #04000



Volume 4: World Flags

Contains exquisitely detailed national and civil flag illustrations from all the independent and dependent countries of the world, plus various international organization and code flags. #04282

YOUR CHOICE

\$67



Bitstream Font Pack 3

The Bitstream Font Pack 3 includes four styles each of Zapf Humanist and Gaskerville. Use these to make text enticing and easy to read. Use these for signs, flyers and invitations. #04010

Font Pack 4

The Bitstream Font Pack 4 includes four styles each of incised 901 and Goudy Old style. Use these to make text enticing and easy to read. You also get five decorative fonts that add flair and flash to your words. #04011

\$98

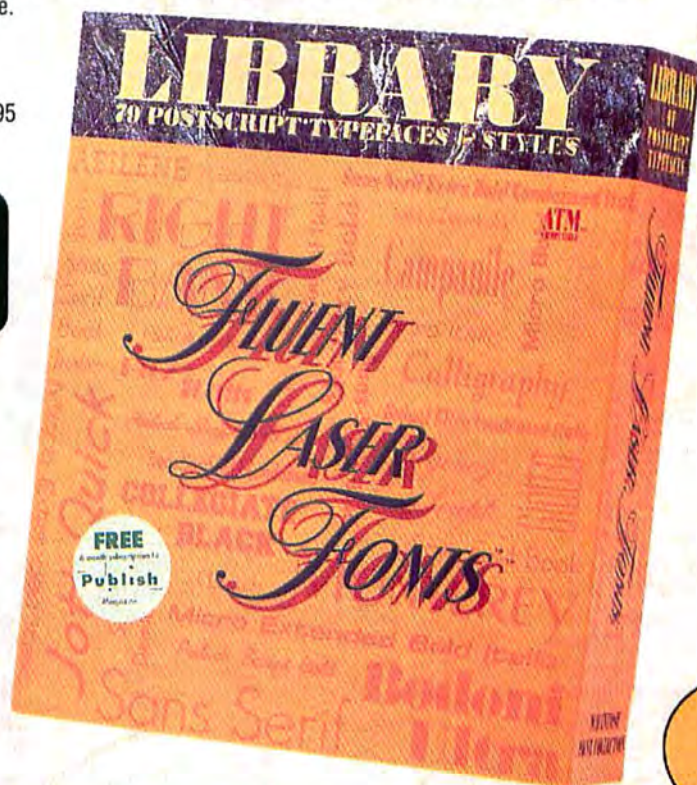
YOUR CHOICE

CASADY & GREENE

Fluent Laser Font Library 4.0

The library includes 79 PostScript typefaces and 79 truetype faces. John Dvorak once recommended these fonts for an Eddy award! The purchaser is entitled to a 6-month free subscription to Publish Magazine. No one else has this kind of variety and style at such an affordable price. (This collection previously sold separately in 21 volumes for \$89.95 per volume.) #00315

\$99



OPEN 24 HOURS • CALL: 1-800-248-0800

CAERE

Typist Plus Graphics 2.0

The first low-cost, hand-held scanner designed for Optical Character Recognition (OCR) that scans text directly into an open word-processing or spreadsheet application, now features a Graphic Editor that comes with a complete set of graphic tools for editing your scanned images and the ability to create full tone images in 256 levels of gray.



\$478
#04459

**\$1300
VALUE**

THUNDERWARE

LightningScan Pro 256

with Read-It! OCR and Enhance - Free!

New! Scan graphics with true 8-bit hardware gray scale and text for one unbeatable price. Includes \$800 in software: our top-rated ThunderWorks scanning software, Read-It! Personal OCR 3.0, and Enhance 2.0 for gray scale editing. Includes the SnapGuide straight scanning system. Requires two Megs of RAM, four Megs recommended.

#00519 LightningScan Compact \$289 #01242 Thunderscan Plus \$199
#02212 LightningScan 400 \$384 #01353 Mac II Power Accessory \$49

\$499

DEST

Personal Scanner with Recognize OCR Software

The first scanner to combine full-page (8.5" wide), handheld scanning and a 10 page automatic document feeder into one desktop unit. Read almost any document into your computer for word processing or desktop publishing applications.

Personal Scan comes as a kit that includes: 300 dpi resolution, cables and Recognize! #03929

#03930 Recognize Software \$515

\$685

**16
MILLION
COLOR
SCANNER**



NISCAN

Spectra For The Mac

Give your pre-press and multi-media projects 24-bit color polish with NISCAN Spectra for the Mac. NISCAN Spectra scans 16 million colors in one 4-inch by 6-inch scan pass, at resolutions of 50 to 400 dpi. This small-format scanner with an upside down flatbed scanning mechanism allows you to place the scanner over your image to scan. For users who want a scanner that does it all, NISCAN offers not only 16 million colors, but 256 8-bit gray-scale, line art, and transparency scanning. NISCAN Spectra is also ideal for image capturing and image database archiving. ScanDo/DA software lets you run NISCAN Spectra under Finder and MultiFinder. Using NISCAN Spectra is easy: it simply connects through your modern interface. NISCAN Spectra is compatible with the Macintosh SE and SE/30 and all Mac IIs and higher.

#04260

\$624

**MAJOR CREDIT CARDS
ACCEPTED**



OCR SYSTEMS

ReadRight

With ReadRight and a full-page scanner you can easily and efficiently convert paper documents into editable computer text files. Recognizing with an accuracy of 99.9%, ReadRight automatically separates text from graphics and outputs text directly into your word processor, spreadsheet or database. Advanced features include a built-in dictionary, error checker and deferred processing.

#00461

\$329

**The Mac
Zone**
Established 1988

C.O.D. ORDERS ACCEPTED

Marstek

800 DPI Hand Scanner

ENHANCE

Enhance



M-800 MAC 64

MARSTEK**M-800 MAC 64 Hand Scanner**

The M-800 Mac 64 is the first hand scanner to deliver a resolution up to 800 DPI. Providing 64 gray levels, the M-800 MAC 64 captures images with exceptional quality. For editing your image, the M-800 MAC 64 comes bundled with "Enhance" V.2.0, an 8-bit, True Gray-Scale, image processing software by MicroFrontier. Now, a complete solution to your desktop publishing needs! #04592

\$279**MARSTEK'S****"Langelo" Color Hand Scanner (8-bit Color)**

Marstek announces the first 18-bit color, true Gray-Scale, hand scanner for Macintosh. Imagine, Color Scanning with a single pass, capturing up to 262,144 colors in lighting speed. The Langelo offers resolution up to 200 DPI in Color mode and 400 DPI in True Gray-Scale mode. Scanned, edit your images with the powerful Enhance, a 32-bit, advanced image processing package by MicroFrontier. With Marstek's Langelo, anyone can be an artist. #04593

\$499**MICROTEK MAKES SCANNING EASIER****MICROTEK****ScanMaker 600ZS**

Introducing the ScanMaker 600ZS, the newest addition to Microtek's award-winning series of color/grayscale scanners. Capable of scanning 24-bit color, 256 shades of gray and black and white, the ScanMaker 600ZS captures images with up to 600 dpi resolution. It boasts outstanding color image quality and features a new compact flatbed design. A built-in SCSI interface makes installation a snap! More amazing is the price... hundreds less than you would expect to pay for a scanner with this many unbeatable features. Included with every ScanMaker 600ZS is a full version of Adobe Photoshop. Adobe Photoshop, winner of MacUsers' 1990 Eddy Award for Software Product of the Year, is a sophisticated image editing and retouch program designed for artists and desktop publishers. #00369

\$1598**MICROTEK****ScanMaker 1850S**

Microtek's ScanMaker 1850S is a revolutionary new 35mm slide scanner that's perfect for desktop publishing, presentation graphics and multi-media applications. You can scan 24-bit color and 256 shades of gray at up to 1850 dpi resolution. With a scanning area of 35mm x 35mm, ScanMaker 1850S is versatile enough to scan slides in portrait and landscape modes. Included is a full version of Adobe Photoshop (winner of MacUser's 1990 Eddy Award for Software Product of the Year), a sophisticated image-editing and retouching program designed for artists and desktop publishers. #00370

\$2298**OPEN 24 HOURS • CALL: 1-800-248-0800**

MONITORS



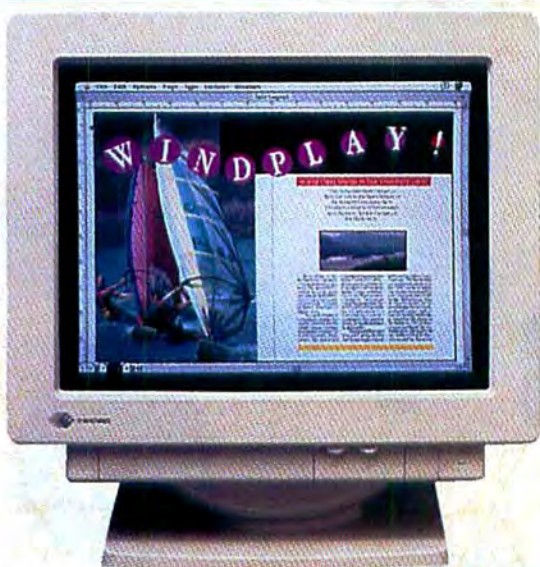
MASS MICRO QuickImage 24 Video Frame Grabber

The QuickImage 24 Video Frame Grabber captures 24 bit color or 8 bit gray scale images from full motion video. It fits in a single NuBus slot and does auto switching between NTSC and PAL signals. It accepts standard Composite and S-VHS input signals. A live preview window lets the user select the exact image desired. A Photoshop plug-in allows users to capture images directly into Adobe PhotoShop. It saves images as Pict2, Tiff or Tiff Compressed for desktop publishing, presentation or video projects. #00180



\$249

E MACHINES MONITORS

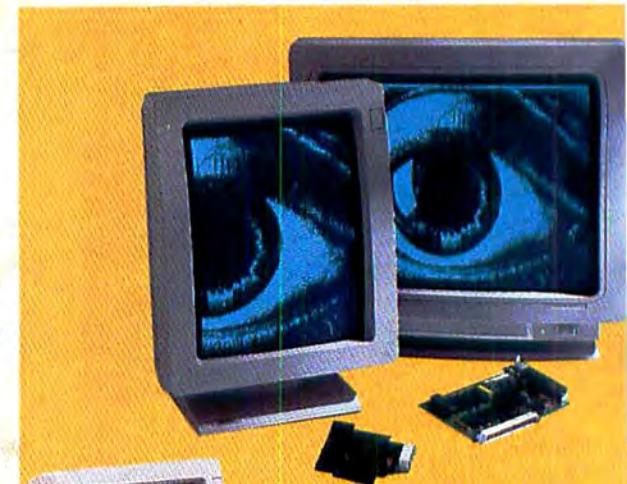


ColorPage T16

This sharp, clear, 16-inch Trinitron gives you 70% more workspace than a 13-inch display. 72 dpi, 832x624, 75 kHz, five mice winner. Uses the built-in video of the new Mac Quadra/040. #04105

#04151
DoubleColor LC Card

\$1148
\$399



GENERATION SYSTEMS

The Publisher Series

The Publisher Series features full-page and dual-page monochrome display solutions for all Macintosh models. In addition to the Portable Benefits, you receive additional workspace, flicker-free refresh rates, anti-glare coating, and a tilt and swivel base that adjusts to any viewing angle.

The Designer Series offers high-resolution 8 and 24 bit color display systems built to energize your passion to produce beyond your own perceived visual capabilities. The Designer 8 is a high-performance Trinitron® system offering 8-bit color/gray scale for the Mac II, SE/30 and LC. The Designer 24 features our patented R.A.C.E. technology and outperforms all other non-accelerated 24-bit boards. Low power consumption permits use in all Mac IIs, including the IIsi.

#04145 Full Page Display SE/30	\$599
#04146 Full Page Display II	\$599
#04147 Full Page Display LC	\$599
#04148 Full Page Display Classic	\$599
#04149 Full Page SE	\$599
#04588 14" Display	\$499
#00551 Mac II 20" 8-bit Color Display & Card	\$289
#00552 Mac II 20" 24-bit Color Display & Card	\$329



14" Display

#04588

\$499

**The Mac
Zone**
Established 1988

FREE SHIPPING ON ORDERS PLACED BETWEEN 9PM & 7AM E.T.

NEW 21" COLOR SYSTEM FROM RASTEROPS

MONITORS



21" Color Monitor System

RasterOps' new two-page 21" graphics systems offer the precision, speed, and high performance you've come to expect for the leader in color technology. From photorealistic imagery to video capture and graphics acceleration, our five new systems offer everything you need for winning graphic design. The RasterOps 24XLi brings graphic design to new heights with two full pages of text and graphics and on-board acceleration. The RasterOps 24XLTV offers the same 24-bit True Color brilliance and on-board acceleration on the 24XLi, plus video capture so you can get all the best shots. With these advancements in the art and science of color, it's no wonder RasterOps aces the competition. #04567

\$3299

24XLTV

The RasterOps 24XLTV display board delivers 24-bit color at lightening speed by having QuickDraw acceleration built on the board. With the added support of live video in a window, 24-bit images can be captured from any NTSC, PAL or SECAM source and be included in any application. the 24XLTV supports the RasterOps 21", two-page display at a resolution of 1152x870. #00521

\$2999

\$3299

24XLi

The RasterOps 24XLi display board has QuickDraw and GWorld acceleration built in. You can add up to 16MB of video DRAM which can be used to enhance the GWorld support or be used as a Ram disk. The RasterOps 24XLi supports the RasterOps 21" two-page display at a resolution of 1152x870. #04118

RASTEROPS PRODUCTS

620 Colorcad Trinitron	3299
379 Colorboard 208 24Bit Upgrade	280
627 Colorboard 264/30 24Bit 351	638
427 Colorboard 364 (Video)	699
503 Imagepak Still Compression Bd	369
483 RasterOps TV Tuner	375
482 RasterOps Video Expander	499
618 19" Color Trinitron	3199
619 19" Color Trinitron	3199
624 19" Hitachi Color	1999
223 19" Mono/GS Monitor	999
625 19" Mono/GS Monitor	999
567 21" Color Monitor	3299
035 24S	449
064 24Si	699
005 24STV 2536	1248
118 24Xli (2544)	3299
521 24XLTV (#2548)	2999
910 8Xi Video Board	749
617 8Xli Vram Expan Kit	1499
623 Accel 16Mb Dram Exp	3399
115 Clearvue/GSxl Card	749
621 Correctcolor Calibrator	2199
637 Espresso Slide Scanner	699
622 Tilt & Swivel Base	229

RASTEROPS

Expresso Personal Slide Scanner

The Espresso™ Personal Slide Scanner is the first affordable product which can scan negative or positive film and output the video signal to any NTSC or PAL compatible display. It is compatible with all RasterOps video products on the Macintosh and is also compatible with any VCR, video camera or can be connected directly to a television. With the Espresso, delicate color saturation, hue and balance control as well as zoom can be achieved through manual adjustments. #04598

\$609



RASTEROPS

ColorBoard 264/SE30

Add COLOR to your Macintosh SE/30 with the ColorBoard 264/SE30 and support 13" monitor (640 x 480 pixels) with 24 bit color and 8 bit Grayscale. 1.5 MB Video increase your speed and productivity. #02627

\$638

OPEN 24 HOURS • CALL: 1-800-248-0800



ARTICULATE SYSTEM

Voice Navigator II

Voice Navigator II speeds up your work & reduces key strokes by allowing you to control your Mac applications by voice. Format documents, control Multimedia presentations, select tools and much more without every hitting a key! Works with anyone's voice, accent, language and Mac application. #03932

\$588

Voice Impact Pro

Voice Impact Pro is a higher quality digitizer with more features: Real time MACE compression and an asynchronous externally clocked serial interface for high speed data transfer, Unidirectional Mic and more! #04749

\$199

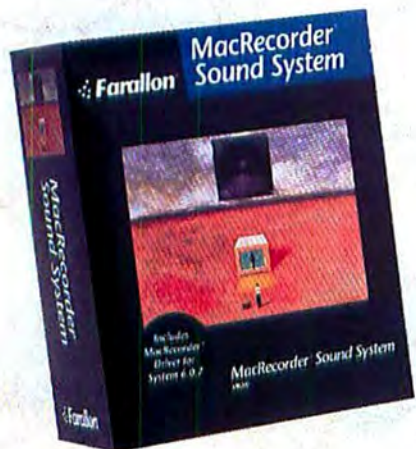


SIGMA DESIGNS

PageView

A full-page display system offering the ultimate in viewing flexibility and comfort. Its 15" portrait screen, with up to 704x940 resolution (72, 80, 88 dpi) graphics resolution, and industry-leading 97 Hz refresh rate, let you view your entire page as you compose, flick free. Includes Low Emission technology standard. PageView is ideal for word processing and entry-level desktop processing. Models to support Macintosh SE, SE30, or IIfx. #03857

\$850



FARALLON

MacRecorder

The MacRecorder Sound System is an audio workshop that lets you record, edit, and play back live or prerecorded sound on your Macintosh. Use the MacRecorder Sound System to enhance your desktop presentations and training materials with voice music. Features a built-in microphone, mike jack, line-in jack, and input level control. #02584

\$158

PROFESSIONAL QUALITY ANIMATION FOR YOUR MAC

MACROMIND

Three-D 1.0

A professional tool for creating high quality 3D animations and photorealistic images for use in video and multimedia production. Three-D gives you a hierarchical time-line to easily and precisely animate unlimited shapes, lights and cameras. #00838

\$1149



Director 3.0

MacroMind Director 3.0 is the multimedia presentation and animation tool that helps communicate with greater impact. It's fast and easier for users to get professional results. Movies and presentations sound, look and play better. #00839

\$689

#02982 Accelerator \$124

C.O.D. ORDERS ACCEPTED

The Mac Zone
Established 1984

DESIGN YOUR OWN HOME
Interiors



DESIGN YOUR OWN HOME
Landscape



DESIGN YOUR OWN HOME
Architecture



ABRACADATA Design Your Own Home

Whether you're a novice or professional, you can now design your own home with these three programs: Architecture, Interiors and Landscape. Architectural Design enables you to draw

floor plans, side view building plans and structural details in a fraction of the time it takes to draw by hand. With Interior Design you can arrange furnishings in your floor plan, explore color schemes and make changes often and easily. Use Landscape Design to create full-color plans for your property by experimenting with flowers, shrubs, trees, walkways, steps, fences and more. All include dozens of sample plans.

#03609 Design Architecture
#03610 Design Landscape
#03611 Design Interiors

YOUR CHOICE

\$64

CLARIS



CLARIS CAD 2.0

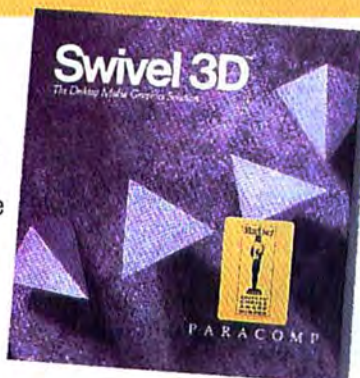
Claris CAD is the professional design and drafting tool for engineers and architects. It integrates a wealth of two-dimensional design and drafting features, including mouse/keyboard entry, construction of fillets, tangents and perpendiculars and automatic dimensioning, while fully utilizing the Macintosh interface. Version 2.0 includes a new interface Graphic guide, which intelligently guides you, anticipating the next steps and locating and indicating key geometric points on screen.

#03693

\$644

PARACOMP Swivel 3D

Swivel 3D is a three-dimensional drawing/modeling program. Intended for graphic artists, engineers, and designers to create complex models for use in presentations, desktop publishing and schematic designs. Features include: a linked database with constraints that allow a user to move the objects' relative movement and orientation, Z buffering, which solves object intersections and a full range of rendering commands, such as shadowing, projecting images and setting light sources. #03619



\$434



INNOVATIVE DATA DESIGN MacDraft 2.1

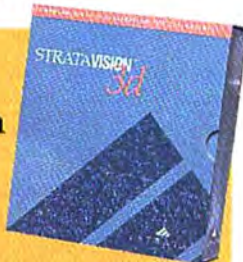
A classic precision drawing program for engineering design and drafting and technical illustration. MacDraft now features a moveable geometric drawing tool palette, support for PostScript output, layers (limited only by memory), on-line symbol libraries, 44 different scales, dimension lines, B-spline and spline curves, automatic area calculation, full Macintosh color support and more!

Reads TIFF (scanned images) and MacDraw II files. MacDraft is the most powerful, low-cost solution to your drawing and drafting needs. #00429

\$278

STRATA, INC. StrataVision D 2.0

Create scenes complete with objects, lights, shadows, textures and reflections. Includes powerful, yet easy-to-use modeling tools. Import 2D and 2D objects from other programs. Create 3D text and logos easily. New animation capabilities include linked objects, hierarchical paths, and geometric and surface metamorphosis. Use StrataVision 3D's powerful raytracer to create the most photorealistic images possible.



\$515

StrataVision 3D is compatible with System 7.0 and System 6.0.3+. #04088



SPECULAR INTERNATIONAL Infini-D 3D Modeler

Introducing Infini-D, an integrated 3D modeling, rendering and animation package for the Macintosh. Now you can generate photo-realistic images and animations with the easy-to-use interface you've come to expect from your Mac. #00815

\$647

infini-D



3D MODELER



32-BIT RENDERER



3D ANIMATOR

SPECULAR

OPEN 24 HOURS • CALL: 1-800-248-0800

PANTONE, INC.

Process Color Imaging Guide

The perfect companion to all Pantone-licensed software Programs. It provides a visual comparison of solid PANTONE Color and process simulations as they would appear on the final printed piece. As many PANTONE Colors cannot be satisfactorily

\$44

reproduced in four-color process, this publication provides the user with the information to best decide whether to specify spot or process color while working on the desktop. #03435

**DENEBA Canvas 3.0**

This new version delivers more than one hundred new features including

significantly enhanced text handling, object blending, Bezier font outlines, and full support for Deneba's revolutionary Open Architecture technology. #00803

\$297**FGM PICTURE This**

PICTure This is an application and desk accessory that converts a wide range of graphics file

\$64

formats to Macintosh PICT and PICT2 formats. #00809

**STORM TECHNOLOGY****Picture Press V2.0**

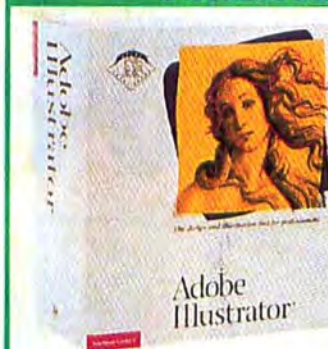
The fastest image compression solution available that meets the latest international JPEG committee specifications. PicturePress 2.0 compresses/decompresses gray-scales and 24 bit color images, reducing files from 1/2 to 1/100th of their original size. Save file transmission time and storage space. The optional Nubus accelerator card improves performance of PicturePress 10-30 time. #04335

\$120

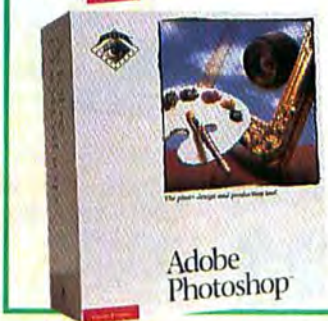
With accelerator
#04336

\$653**Process Color System Guide**

When you need a much broader selection of process colors, turn to the PANTONE Process Color System Guide. This fan-out process color selector provides users with a visual color standard and screen percentage values for over 3,000 new CMYK combinations which are easily created. Specified and reproduced with your favorite graphics, program. #04056

\$44**POWERFUL PRODUCTS FROM ADOBE****Adobe Illustrator 3.0**

You can create PostScript technical illustrations, free form sketches, or even trace scanned images automatically. Improvements in the user interface make using Illustrator easier than ever. The most significant new function allows you to enter and manipulate text directly on the page without working through a dialog box. #03558

\$369**Adobe PhotoShop 2.0**

The affordable Macintosh image-processing program with enough power and versatility to be used as a paint, preprocess, color correction and darkroom system. And it does it all in living 24-bit color. Adobe PhotoShop's full range of filters, painting, drawing and selection tools give you the control and precision you've been missing. #04042

\$549**ADVANCED VISION RESEARCH
AVR 8000/CLX
Image Scanner**

Introducing the new true 400 dpi scanners from AVR. These new models join the AVR 3000 Series of 300 dpi grayscale and color scanners. The AVR 8000 Series offers models capable of scanning 16.8 million colors and 256 shades of gray at true 400 dpi. And, through a custom interpolation process, the AVR 8000 Series can scan up to 1600 dpi! Included with both the AVR 3000 and 8000 scanners is AVR's ScanPack, a set of scanning and image enhancement tools; Adobe Photoshop, and a 2-year warranty. Other features include JPEG-compression/decompression, Apple Scanner emulation, an optional 100-sheet Automatic Document Feeder, and an upgrade path from grayscale to color.

#04551 AVR 3000/CL Plus

#04552 AVR 8000/CLX

\$1349**\$1549**

The Mac
Zone
Established 1984

ALL U.S. ORDERS INSURED - NO EXTRA CHARGE

Easy
Color
Paint

te colorful artwork!
Color Paint is really easy to use.
Whether you're a beginner or painting pro,
easily select the complexity level desired,
from ECP Junior to ECP Artist, and in no time
you'll be creating colorful sketches and
drawings. This critically acclaimed color
painting program features such tools as
horizontal and vertical flipping, rotation,
stretching and shrinking,
color blending - and more.
Mark your creativity
and add flair to your
art. #03862



\$44

CLARIS



Powerful graphics standard for the Macintosh.
MacDraw Pro
Powerful graphics standard for the
Macintosh! Tear-off palettes allow access to
a variety of innovative and time-saving
features. Features include a flexible style bar,
powerful gradient fills, new precision zoom
and more. Now you can
design at over
300 dpi.
#0373

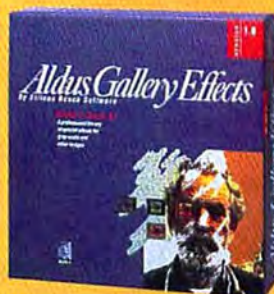
\$279

DATA TECHNOLOGY
MacVision

MacVision is an easy-to-use video
digitizer for your Mac which
captures images of 3-D
objects. You can then edit,
print, and save these
images as files in a variety
of formats. MacVision
produces images with
16 shades of gray for use
in most popular publishing and
graphic arts programs.
#3705



\$258



ALDUS

Gallery Effects

Aldus Gallery Effects is a graphics program that gives
designers the power to transform color, grayscale or even
bitmapped images into sophisticated art. With the Gallery
Effects library, artists can produce vivid, dramatic art
easily, reliably and with consistent results. Use while
working in leading applications that support plug-in filters,
as a stand-alone application,
DTP, or for applying effects to
PICS animations.

#04121

\$134

ALDUS

SuperPaint V3.0

Aldus SuperPaint is the complete painting, drawing and
image-enhancement tool - whether you're creating fine
art, business illustrations, full color or black and white.
We've combined these elements into one unified graphics
environment that works exactly the way you expect - no
surprises, nothing to come
between your visual concepts and
the images you produce on your
Macintosh®.
#04190

\$134



DELTA TAO

Monet/Color MacCheese Bundle

Monet - A totally new type of graphics
application. Monet lets you create
stunning impressionist paintings. Color
MacCheese - Color paint that's powerful
enough for artists, yet simple enough for
anyone. Does anti-aliasing,
transparency,
full color patterns,
transmogrification
and more. #04587

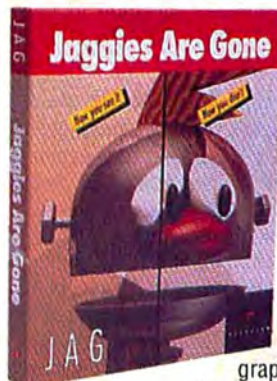
\$249

FRactal Design Painter

Fractal Design
Painter™ lets your
Macintosh create
original art or
embellish scanned
images with realistic
natural media effects by duplicating tradi-
tional tools and textures in 24-bit color.
Painter includes brushes, pens, chalks, and
even paper grains (22 included). Painter
interacts with virtually all Macintosh
illustration and imaging software, supporting
PICT, TIFF, ColorStudio
and PhotoShop
formats.
#04460



\$199



RAYDREAM
JAG™

JAG is for anyone concerned with
the look and visual impact of the
images and animations they create.
It is appropriate for use with all color
paint packages, 24 bit photo
retouching software, 2D animation
and multimedia toolkits, and 3D
modeling and rendering environ-
ments. JAG is perfectly suited to the
needs of advertisers, animators,

graphic designers,
illustrators, multimedia
producers, and 3D enthusiasts alike.
#04150

\$69

OPEN 24 HOURS • CALL: 1-800-248-0800

CODA

Finale

Finale is designed to be the last music composing and publishing software you'll ever need. Finale understands music and music notation. Compose, edit, transcribe, orchestrate and publish without using a pencil. Improvise a score on a MIDI keyboard and see it displayed on screen in standard music notation in seconds. All you need is the inspiration to write music. Finale does the rest.

#03127

\$548



OPCODE SYSTEMS, INC.

EZ Vision

EZ Vision is an intuitive M sequencer for recording, editing and playing back n with MIDI synthesizers.

Equipped with familiar tap deck style controls and 16 tracks, it acts as a complete

recording studio, allowing graph

editing, arrangement and mixing

EZ Vision is compatible with m

notation programs, allowing pri

scores. #03937

\$99

The Book of MIDI

The Book of MIDI is an award winning hypercard stack that teaches beginners all about MIDI. It incorporates animation, digital sound, a dictionary of MIDI terms, and even has an interactive MIDI Game! #04069

\$29



GREAT WAVE SOFTWARE

ConcertWare + MIDI 5.0

ConcertWare®+MIDI is a complete music package for the amateur, professional, or hobbyist. The Music Writer allows you to record in real time (or step time) as you enter music with a MIDI compatible keyboard (or by using the Macintosh keyboard or the mouse.). Two other programs are also included. The Music Player plays songs through your synthesizer. The InstrumentMaker® application allows design of synthesized sounds for playback directly on the Macintosh.

#03187

\$97



MARK OF THE UNICORN

Performer

Performer Version 3.6 is a creative and flexible environment for composing, recording and performing music. From its comprehensive array of features to its intuitive user interface, Performer is the sequencer of choice for professional musicians and recording engineers.

#02500

#04429 Midi Time Piece \$375

#04591 Video Time Piece \$375

\$375



\$169

★ NEW PRODUCT ★

MONSTER GROUP, INC.

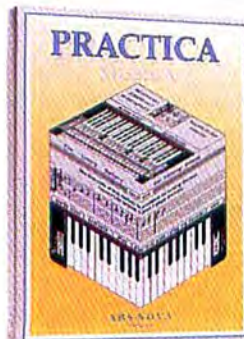
MacSpeaker

MacSpeaker opens the door to h fidelity sound on your Macintosh.

MacSpeaker is a compact, high power speaker with a unique Sonic Imaging

Control that gives a rich, full stereo sound in an up. (Optional carrying bag available) MacSpeaker compatible with any Macintosh.

#00201



ARS NOVA

Practica Musica 2.2

One of MacUser's "Best 200 products of 1989" Practica Musica is a music tutor that covers ear training and music theory - for both beginners and advanced students. Using either the Mac speaker or a MIDI instrument, it teaches you how to recognize and notate intervals, chords, melody and rhythm, identifies chords that you play, gives you practice in writing tunes by ear and much more. It will even invest a short melody in your choice of key, scale and meter! Includes coordinated textbook Windows on Music.

#01479

\$68

PASSPORT DESIGNS

MIDI Interface

Make music with your computer! Passport's MIDI Interface provides the industry standard connection between your computer and MIDI synthesizers. Compose, record, edit, learn to play, notate and print music more easily than ever before. With a Passport MIDI Interface you're well connected to the award winning library of Passport Music Software.

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MEDIA LAB
ScriptExpert v2.0
 ScriptExpert is push-button programming for HyperCard by Dan Schafer, the author of the best-selling book, HyperTalk Programming. ScriptExpert requires little or no programming experience. You can write grammatically correct scripts by pushing buttons and answering questions. ScriptExpert knows the rules for every command, functions, property and message in HyperTalk. It lets you focus on your project because it remembers the syntax and structure of your scripts. ScriptExpert is the ideal companion for HyperCard training classes. #03776

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CLARIS
HyperCard Development Kit
 Create and customize your own software. HyperCard software works like a pack of index cards. Store information on cards that appear on the Macintosh screen. Easily create and program buttons that access other cards or stacks with a single click. In addition to text, you can create and store graphics, scanned images—even sounds.

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3 GREAT PROGRAMMING TOOLS FROM SYMANTEC

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 The Fast, Intelligent Guide for Macintosh Programmers

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THINK Reference
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 Think Pascal 3.0 is a full Pascal implementation with all the features needed to write applications on modern Macs. The multi-pass compiler generates tight, optimized code that's 32-bit clean. It supports Object Pascal, SANE, the 68881 math coprocessor and the 8020. It's also compatible with MPW and can use MPW object files without conversion. The development environment makes programming clean and easy.

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THINK Pascal
 The Fastest Way to Finished Software

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Think C
 Think C integrates the editor, linker, and compiler to form a complete C language development environment. Many major Mac applications have been developed in Think C, including Quark Xpress. Version 4.0 now supports Object Oriented Programming (OOP) with a number of compiler enhancements and a full class library. It provides full source level debugging and the compiler produces tight, highly-optimized codes.

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NEW ERA nuBASE

nuBASE is a full-featured relational database for the

Macintosh. It provides Graphical User Interface (GUI) that allows both the novice user and experienced developer to feel right at home. nuBASE provides information management solutions to all levels of business, regardless of database size. And best of all, it's fast and well documented. Users can create presentation quality entry screens and reports without programming, or may choose to custom design sophisticated applications using the advanced procedural language. #04185

\$179



GOLDSTEIN & BLAI Mac Bible Guide to FileMaker Pro

FileMaker has been the far the most popular Mac database for years.

But very few guides to the program exist, and none of them covers the new Pro version in a systematic and understandable way. Our Guide to FileMaker Pro does exactly that. Moreover, it's the only book written for the 400,000 people who use FileMaker every day, not just for database experts. The book begins with fundamental database concepts, details FileMaker's capabilities (and limitations — something always left out of the manual) and includes practical solutions to scores of the most common problems user confront. #04093

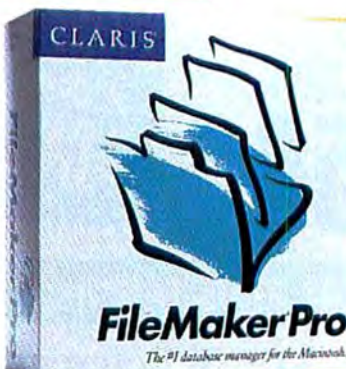
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FOUNDATION SOLUTIONS EPlanner 2.0

EPlanner is a mid-range project planning and tracking application for corporate and private, hands-on project managers needing a simple yet robust tool for planning and tracking projects. EPlanner makes full use of the Mac interface for manipulation of Gantt charts, calendars, resource pools and chart symbols. EPlanner is intuitive to use and has complete on-line hyper-text help. #04196

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CLARIS FileMaker Pro

FileMaker Pro is an extended flat file manager. Its look-up function extracts information from other files. The new graphics tools streamlines the generation of reports and layouts.

User-definable buttons automate repetitive tasks or activate scripts. #03478

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Slash 4D development times! Produce feature-rich applications in record time. 4thRIGHT! and 4thRIGHT! Professional are the most complete solutions available to speed you through your 4th Dimension projects. #04566

#04560 4thRIGHT! Pro \$449

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PORTFOLIO SYSTEMS Dynodex 2.0

Dynodex stores names, addresses, and phone numbers, and finds information fast. Print double-sided directly onto standard organizer-size paper. #00119

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DynoPage

DynoPage lets you print any Mac file on double-sided pages of any size. It prints spreadsheets, project lists, sales plans, etc. on personal-organizer pages. #03977

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AFTERHOURS SOFTWARE TouchBASE

TouchBASE is a database to keep track of personal and business contacts. It's handy all the time because it is a desktop accessory.

TouchBASE can print envelopes, labels, address books, fax cover sheets, and reports. It's even a multi-user product so you can share your database on a network or use it all by yourself. #03908

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Ultimate Payroll

Ultimate Payroll handles it all, including pensions, DI, vacation/sick time, tips, piecework, and even minds you to make your tax payments! Payroll 1 will print W-2's, 941's, and provide information for all other reports. #01875

\$198



CHIPSOFT

MacInTax

MacInTax is easy to use! Guides you to the forms you need' on-line help menus explain IRS rules; IRS Audit feature points out possible audit-triggering situations. On-screen displays look like official IRS forms. Free support for registered users by phone, mail, BBS, or toll-free fax (7 days a week during tax season.)

Transfers data to

the proper forms -

automatically! Once you've entered

the data, MacInTax calculates even the most complex return in less than 10 seconds! #04603

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Write your own valid will without ever calling a lawyer. Just answer the questions that WillMaker asks and

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program constructs a personalized will with full legal standing. #00481

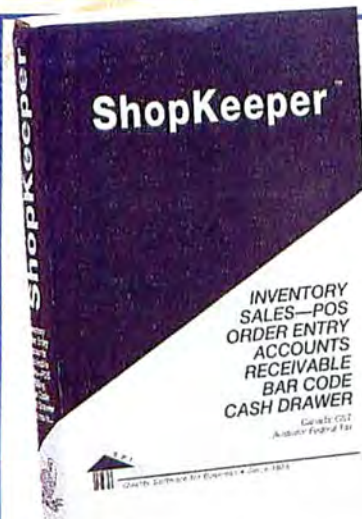


For the Record 2.0

For the Record helps you keep track of all the important information in your life: credit card numbers, safe deposit boxes,

\$31

emergency information, insurance policies, as well as household inventory. #3781



SHOPKEEPER

ShopKeeper 5.0

Inventory and point-of-sale (POS) software. Order entry, accounts receivable, Bar Code & Cash Drawer control, auto billing, customer records, price schedules, custom forms, 5 inventory modes, reports, mail labels, custom forms, promos, auto vendor orders, General Ledger links, and dozens of other features. Used by over 300 different types of businesses -

retailers, wholesalers, mfg's, schools and local government. #04111

\$249

Bill-IT

Bill-IT consolidates your invoicing, sales, billing, accounts receivable functions; handles up to 32,000 inventory and customer records, supports drawers, discounts, packing slips, layaways, mailings, and reports. Primarily for service businesses, professionals, clubs and associations with simple, unstructured inventory needs. #04599

\$114



TELEWARE

M.Y.O.B. 2.0

M.Y.O.B. combines a powerful, fully integrated accounting program with management tools you can't find anywhere else! With just a few clicks, you can control every facet of your business... print your financial reports, reconcile your checkbook, do invoicing, even call your customers. M.Y.O.B. is easy to learn and is simple to use, so it makes "doing the books" a breeze. Its unique graphic navigation moves you instantly through every part of the program. #03535

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JIAN

BizPlan Builder

BizPlan Builder 4.0 gives you a structured framework for developing your own business or marketing plan. All you need is a word processor and a

spreadsheet to edit the preformatted files

and adapt them to your needs. It has 90 pages of outlines, headlines, partial sentences and paragraphs, tables with built-in tabs, lists, and financial statements. Helpful prompts ask questions and make suggestions. It's useful for making presentations to investors, senior executives, or clients. #04257

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4154	QuickSilver II SI W/Fpu	308
0833	QuickSilver IISI Cache Card	269
4325	Transwarp SA Accel 25MHz W/Fpu	815
Connectix Corporation		
2654	Virtual - Ser30, Iix, Iicx	114
2652	Virtual W/Pmmu Mac II 2.0.4	187
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4162	Dual Port IISI W/Fpu	169
2877	Fast Cache IISI 64K Ram	278
4181	Fast Cache IISI	308
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3729	SCSI Powercard W/O Simms	1124
4323	Universal Powercache 33 Mhz	749
4634	Universal Powercache 33 Mhz w/FPU	979
4319	Universal Powercache 40Mhz	948
4320	Universal Powercache 40Mhz w/Fpu	1189
4321	Universal Powercache 50 Mhz	1459
4322	Universal Powercache 50Mhz w/Fpu	1999
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3499	030 Upgrade Iix	249
3226	030 Upgrade Mac II	329
3229	030 Upgrade Se	435
3818	Macsnap 596Kx 512Kx-4Mb W/SCSI	455
3230	Marathon 030 Upgrade Plus	528
1260	SCSI Port Adapter Macsnap	99
3222	Upgrade 030 Iix W/Virtual	528
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4646	Classic Performer Accelerator	249
4647	66881 Math Coprocessor Upgrade	74
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4109	SCSI II Card Plus	201
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4336	Picture Press 2.0 W/Accelerator	649
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4064	Galileo 62P-Nubus	419
0531	Geminii Classic 33 Mhz No Fpu	1449
0545	Enterprise 030 Lc 16Mhz	609
4006	Galileo II Video Card Plus	510
4292	Galileo II Video Card Plus	510
3633	Geminii 030 20Mhz W/Fpu	949
2902	Geminii 030 20Mhz W/O Fpu	798
2903	Geminii 030 25Mhz W/O Fpu	1199
0527	Geminii Classic 20 Mhz No Fpu	949
0528	Geminii Classic 20 Mhz W/Fpu	1049
0529	Geminii Classic 25Mhz No Fpu	1179
0530	Geminii Classic 25Mhz With Fpu	1349
0537	Geminii Ultra 33 Mhz With Fpu	1749
0538	Geminii Classic 40 Mhz No Fpu	1549
0540	Geminii Classic 40 Mhz With Fpu	1749
0546	Geminii Classic 50 Mhz No Fpu	1699
3752	Geminii II 030 40Mhz W/Fpu	1850
0532	Geminii Ultra 33 Mhz No Fpu	1379
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3632	Gemkit (Intl. Version)	125
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0034	Mercury 030 16Mhz W/Fpu (Plus)	675
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0043	Mercury 030 16Mhz W/O Fpu (SE)	358
0036	Mercury 030 16Mhz W/O Fpu Plus	518
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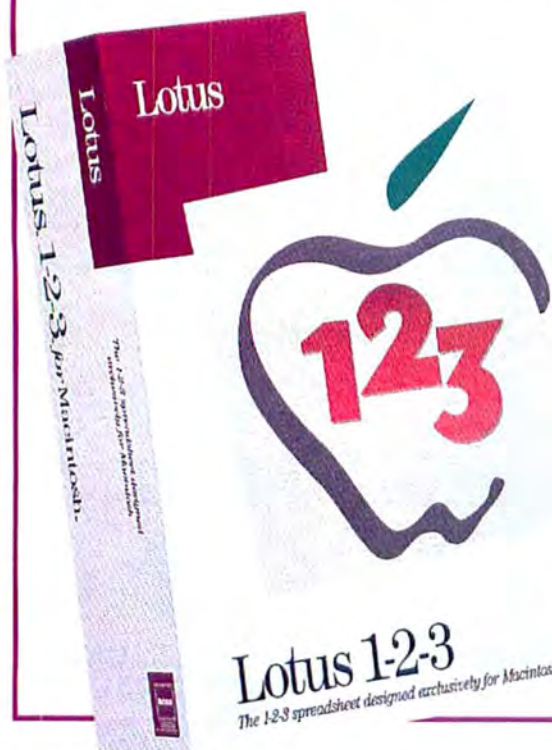
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ic	39	0669	Dark Castle	35	3451	Font 136 Shelley Allegro Scr	93	2410	Font 85 Cechin	119	2410	4208 Core Hc Mac 330 Hd Ext.	2195
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ic	39	0669	Dark Castle	35	3459	Font 144 Minion Xprt Coll.	239	2418	Font 93 Folio	119	2418	Quantum Mechanisms	
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ic	39	0669	Dark Castle	35	3465	Font 150 ITC Garamond 2	119	2424	Font 99 New Aster	239	2424	4693 Datscal 52Mb Q Lps Int Hc/Cx	329
ic	39	0669	Dark Castle	35	3466	Font 151 Rockwell	177	2425	Font 100 New Aster	239	2425	4693 Datscal 52Mb Q Lps Int Hc/Cx	329
ic	39	0669	Dark Castle	35	3467	Font 152 Gili Sans	177	2426	Font 101 New Aster	239	2426	0019 Datscal Int 105 Q Hc/Cx	499
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ic	39	0669	Dark Castle	35	3469	Font 154 Lucida Math	93	2428	Font 103 Font Family Group	255	2428	Generation Systems	
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ic	39	0669	Dark Castle	35	3471	Font 156 Bundesbah. Pl.	119	2430	Font 105 Font Family Group	255	2430	4569 Gen. Sys. 45 Mb Removable	589
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ic	39	0669	Dark Castle	35	3475	Font 160 Wood Type 2	119	2434	Font 109 Font Family Group	255	2434	PLI	
ic	39	0669	Dark Castle	35	3476	Font 161 Bembo	119	2435	Font 110 Font Family Group	255	2435	0446 PLI Q 200 Mb Ext Hd	1199
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ic	39	0669	Dark Castle	35	3492	Font 177 Spartan Classified	93	2451	Font 126 Font Family Group	255	2451	Claris	
ic	39	0669	Dark Castle	35	3493	Font 178 Benetton	239	2452	Font 127 Font Family Group	255	2452	0396 Hypercard 2.1 Dev. Kit	139
ic	39	0669	Dark Castle	35	3494	Font 179 Times Symbol	93	2453	Font 128 Font Family Group	255	2453	Individual Software	
ic	39	0669	Dark Castle	35	3495	Font 180 Adobe Caslon	119	2454	Font 129 Font Family Group	255	2454	1970 101 Scripts And Buttons Hyper	34
ic	39	0669	Dark Castle	35	3496	Font 182 Neue Helvetica Ext. 3	119	2455	Font 130 Font Family Group	255	2455	Medialac Tech	
ic	39	0669	Dark Castle	35	3497	Font 184 Neue Helvetica Ext. 3	119	2456	Font 131 Font Family Group	255	2456	3776 Script Expert 2.0	44
ic	39	0669	Dark Castle	35	3498	Font 185 Shannon	119	2457	Font 132 Font Family Group	255	2457	Spinnaker	
ic	39	0669	Dark Castle	35	3499	Font 186 Bembo 2	119	2458	Font 133 Font Family Group	255	2458	2799 Spinnaker Plus 2.0	275
ic	39	0669	Dark Castle	35	3500	Font 187 Gath Graphic	239	2459	Font 134 Font Family Group	255	2459	Symmetry	
ic	39	0669	Dark Castle	35	3501	Font 189 Helvetica Neue Cond 2	177	2460	Font 135 Font Family Group	255	2460	0434 Hyper DA II	39
ic	39	0669	Dark Castle	35	3502	Font 191 ITC Konnia	119	2461	Font 136 Font Family Group	255	2461	ILLUSTRATION	
ic	39	0669	Dark Castle	35	3503	Font 190 Helvetica Neue Cond 3	177	2462	Font 137 Font Family Group	255	2462	Adobe Systems	
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ic	39	0669	Dark Castle	35	3505	Font 195 Type Before Gutenberg	193	2464	Font 139 Font Family Group	255	2464	3971 Streamline 2.0	118
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ic	39	0669	Dark Castle	35	3508	Font 2 ITC Bookman	119	2467	Font 142 Font Family Group	255	2467	4121 Aldus Gallery Effects	134
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ic	39	0669	Dark Castle	35	3512	Font 23 ITC Franklin Gothic	177	2471	Font 146 Font Family Group	255	2471	Computer Associates	
ic	39	0669	Dark Castle	35	3513	Font 24 ITC Cheltenham	119	2472	Font 147 Font Family Group	255	2472	4414 Cricket Draw 1.1	209
ic	39	0669	Dark Castle	35	3514	Font 25 Park Avenue	62	2473	Font 148 Font Family Group	255	2473	Deneba	
ic	39	0669	Dark Castle	35	3515	Font 26 Bodoni	119	2474	Font 149 Font Family Group	255	2474	0803 Canvas 3.0	297
ic	39	0669	Dark Castle	35	3516	Font 27 Letter Gothic	119	2475	Font 150 Font Family Group	255	2475	Dynaware Usa, Inc.	
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ic	39	0669	Dark Castle	35	3521	Font 31 ITC Tiffany	177	2480	Font 155 Font Family Group	255	2480	Pantone Matching Grid	
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ic	39	0669	Dark Castle	35	3523	Font 33 Stencil, Hobo & Brooms	93	2482	Font 157 Font Family Group	255	2482	4056 Pantone Color System Guide	44
ic	39	0669	Dark Castle	35	3524	Font 34 Aachen & Revue & U Rom	119	2483	Font 158 Font Family Group	255	2483	Paracom	
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Managing Your Money 4.0	109	SCANNERS AND OCR SOFTWARE		3345 Power Backer 360	289	3771 Quick Keys 2 Version 2.1	93
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Chicken 3.0 Mac	44	2847 Documap	86	Tripp Lite		4144 Maxima 2.0	44
Dominator		Animas		4605 Isozair 4 Surge Protector	49	4013 MC73 PMMU	148
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Adius Persuasion 2.0	328	4172 The Typist Plus Graphics	478	Mass Microsystems		2586 Retrospect 1.3	146
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Mora 3.1	264	4592 MAC 600 64 Hand Scanner	279	3010 Kurta ADB 12X12 Tab W/Pen&Cur	329	3616 Clickchange 1.04	56
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Imagewriter Ribbon - Blue	4	4064 Microtek 6003S	1198	0607 Wacom 12X12 Static Sur 421 E	935	2067 Postversion 2.5	37
Imagewriter Ribbon - Brown	6	0369 Microtek 6002S Color/Gray	1598	3803 Wacom SD-311E	1325	2194 Pycro 4.0 For Mac	24
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Imagewriter Ribbon - Multicol	6	Nisca Scanners		4193 Wacom SD-320L	720	1020 Superlaserpool 2.0 Single	92
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Dixxon Pin Paperhd Cartg/Bk	11	2187 The Accutest V3.0	518	3802 Wacom Sc-100 4 Button Cursor	120	Insight Development Corp	
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512K Adapter Kit Grappler	26	3231 The Complete Half-Page Scanner	294	TABLET BACKUP		Kent Micro	
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Instruments (MicroLaser)		3232 The Complete Full-Page Scanner	624	2161 Emac 150 Tape Backup Drive	715	1817 Night Watch For Mac 1.03	83
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Legal Cassette (TEX-7012)	55	1095 Lightning Scan Compact	289	After Hours Software		1244 Auto Save II V2.0	26
1MB Memory Upgrade	239	2212 Thunderware Lightning Scan 400	384	3908 Touch Base 2.0	78	3328 Backmatic	49
Toner Kit	110	0520 Lightning Scan Pro Scanner	499	Casio		3329 Power Icons	86
OPC Cartridge	90	Kensington		3336 Casio Boss S18600	139	3406 Empower I Version 4.0.1	24
ERS		3676 Pass Proof (C, L, Left Drive)	70	Co Software		3407 Empower II Version 4.0	149
n Technology Corp		3660 Pass Proof (For SE Type Cases)	70	3624 Alarming Events	83	Mainstay	
LaserScript Lx	1728	4419 Pass Proof Classic 64062	70	1497 Calendar Maker 3.0	30	0174 Capture 4.0 For Mac	67
LaserScript Toner (2Pc)	69	3357 Laserwriter II Security System	32	Chipsoft		4314 Click Paste V2.1	78
		2979 Apple Security Kit System	32	3532 IFX Personal Tax Analyst Mac	14	3395 Marco Polo - Twin Pack	129
BP4040 PostScript Laser Printer	1499	SPREADSHEETS		DiscoTech		3394 Marco Polo Single	129
Address Writer	479	Aclus		4505 Facilitator	129	3399 Mark Up - 5 Pack	399
Costar Labelwriter II	189	Individual Software		Jam Software		3397 Mark Up - Single User	175
Costar Organizer	169	2195 Power Macros For Excel 2.2	33	4506 Smart Alarms 3.1 1-4 Users	129	3398 Mark Up - Twin Pack	219
Label Writer Labels (12 Pack)	48	Informix		4407 Smart Alarms 3.1 5-6 Users	185	Mediac Tech	
Label Writer Labels (2 Pack)	11	2224 Wingz 1.1A	244	Mainstay		3778 Step Ahead 1.0	56
				3931 Mac Schedule Plus	219	Microcom	
						3823 Microcom 911 Utilities	88

Se Habla Español



LOTUS

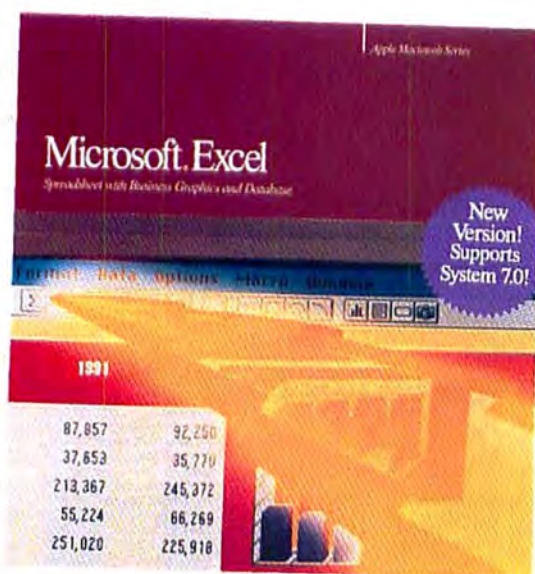
Lotus 1-2-3 Competitive Upgrade

Completely redesigned for use on the Macintosh, this new product makes your work incredibly easy! Lotus 1-2-3 for Macintosh delivers innovative spreadsheet capabilities that provide users simple access to commonly used functions, the ability to customize the desktop to their work styles, and direct manipulation of text, graphs and object for intuitive operations. It also provides full file formatting, macro and keystroke compatibility with all versions of 1-2-3 using the menu invoked by hitting the "F" key. It will also fully support Apple's new System 7 operating system.

#00518

\$89

#00507 Lotus 1-2-3 \$339

MICROSOFT
Excel 3.0

Microsoft Excel is the most advanced spreadsheet for the Mac. It combines a spreadsheet with business graphics and a database. It provides a worksheet area of 16,384 rows by 256 columns. Presentation tools, such as multiple fonts, variable row heights, shading, custom number formats, 68 built-in chart types and more, make Microsoft Excel the ultimate business tool. Excel has support from hundreds of other manufacturers' products and templates. Transfer Excel charts and worksheets into Word. Easy to update. #00227

\$299

ABSOLUTE SOLUTIONS

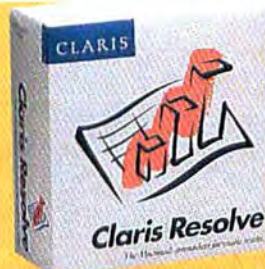
Computerized
Classic
Accounting

Add to Excel 3.0. Computerized Classic Accounting is the only accounting package that does accounting in the form and organization of manual books. Anyone who knows traditional manual accounting will feel at home with CCA. It allows for extremely fast data entry, print checks, invoices, W-2's, etc. and generates reports. Since all CCA's documents may also be opened using Excel, you can customize, analyze, create forecasts and graphs using actual data that CCA summarized, formatted, and organized during the accounting process. #03369

Computerized Classic Accounting

Expenses January

\$229

CLARIS
Resolve

Whether you're simply tracking expenses or creating sophisticated business models, Claris Resolve gives you the analytical tools needed to make informed financial decisions. Get started quickly using the accessible menus and online help. Visualize the results of your

calculations with a full set of charts.

Present your final analysis integrating graphics and text for expressive, persuasive reports. #04306

\$234

The Mac
Zone

Established 1984

CALL 1-800-248-9948 IF NOT 100% SATISFIED

COMPUTER ASSOCIATES

ACCPAC Simply Accounting

ACCPAC Simply Accounting contains everything you need to get up and running in a flash: A primer that walks you through basic accounting principles, understandable documentation and software that includes a real-life tutorial with sample data. #04553

\$134

ACCPAC Bedford V1.1

Included in one fully integrated package ACCPAC Bedford Simply Accounting contains all accounting functions small business need most: General Ledger, Accounts Receivable, Invoicing, Job Costs, Accounts Payable, Payroll, Inventory, and Financial Statements. #04553

\$134



SURVIVOR

MacMoney

MacMoney is a full double-entry personal and small business bookkeeping system and financial planning tool. MacMoney tracks

expenses, bank accounts, credit cards, assets, liabilities, cash and income. You can create up to 250 accounting categories and divide transactions among as many as 8 categories. #01582

\$58



FTSYNC

ccountant, Inc.

ccountant, Inc. is perfect for any type of business - retail manufacturing, service or professional. It provides reports and forms analysis like no other software, so you can do what you do best and stop worrying about the accounting chores. ccountant, Inc. is a fully integrated accounting system. #3986

\$338



PEACHTREE atOnce!

Winner of Macworld's 1990 & 1991 World Class Award and the

MacUser 1989 Editor's Choice Award, atOnce! includes General Ledger, A/R, A/P and Payroll. All four modules are seamlessly integrated, so that information entered into one module is automatically reflected in other modules. atOnce! provides on-line, context-sensitive help and a HyperCard tutorial for hands-on practice. #02594

\$189



TIMESLIPS

TimeSlips III 2.0

TimeSlips III for the Mac is the ultimate time tracking billing software system. With it you'll find that your workday is being spent more productively, and that your billings are much more complete. The features and functions are so simple, they practically run themselves. #02512

\$194

SMART BUSINESS PRODUCTS FROM INMAN

Business Plan Toolkit



Business Plan Toolkit V.4.0

If you are a small business person or are an entrepreneur attempting to raise capital or secure a loan, this package is for you. Business Plan Toolkit is a practical guide for preparing a professional business plan with complete financial analysis, charts, sales forecasts and winning text. A complete sample plan is included on paper and on disk. Received 4.5 mice from MacUser. #03910

\$95

Business Sense 1.4.1

This accounting program has set the standard for small and medium sized businesses who need a program with General Ledger, Accounts Receivable, Accounts Payable, Payroll, Budgeting Job Costing and Invoicing. #00229

\$128

Essentials of Accounting

If you think accounting is tedious, think again! Regardless of your experience, Teach Yourself You will quickly master the essential concepts of accounting at your own pace. #04590

\$34



IN HOUSE SOFTWARE

In-House Accountant

In-House Accountant was developed from scratch to take full advantage of Macintosh's power. Familiar point-and-click operations let you see at a glance all of your financial information, anytime you want. Entries made in the transaction list immediately update all related items in other lists, so there's never a need for "posting." The program handles payables and receivables, by letting you move among various accounts without ever having to change modules, or even close a window. #03782

\$134

OPEN 24 HOURS • CALL: 1-800-248-0800

PassProof

The first complete data security system for the Mac. Heavy duty hardware includes disk drive lock, floppy and SCSI port plates. Special software includes password protection for multiple users, Quick Cover™ screen locking feature and User Log

\$70 to track authorized and unauthorized use. #04419 (Classic)

**Power Backer**

The Power Backer 520 supplies continuous power to protect any system from a momentary dip in power to a complete blackout. When power is restored, unit automatically switches back to AC wall current and filters surges and spikes. Back up power lasts from 5 to 65 minutes depending on unit chosen. (Name indicates VA rating and protection.) #03347



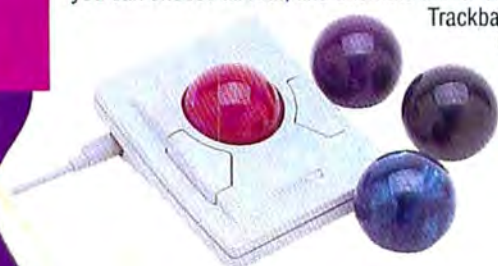
\$39

Custom Color Trackball

With Kensington Custom Trackballs, your Expert Mouse or Turbo Mouse can take on a whole new personality. Choose from any of four vibrant new colors. And of course, if variety is what you want, you can choose all four, and alternate them. Kensington Custom Trackballs will fit any Kensington mouse. #04422

Turbo Mouse ADB

Winner of the '87, '88 and '89 MacWorld World Class Awards for Best Input Device. Turbo Mouse is quicker, more precise and easier to use than any other mouse. You move only the ball, not the whole mouse. #01411

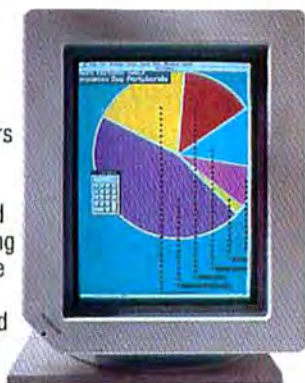


\$10

\$107

**Radius Pivot Anti-glare Filter**

The perfect solution to a big, glaring problem. These high quality Anti-Glare Filters reduce the glare reflected from your large screen contrast and clarity up to 20 times! You'll be able to work more comfortably and efficiently — no more squinting and straining to read what's on your screen; no more sore eyes and blurred vision. Made of optical quality glass with ceramic anti-reflection and scratch-resistant coatings, these Filters slip right onto the front of your monitor for a "light-tight" fit. They allow the light to pass through your filter, never around it. They even increase the resolution of your screen display by eliminating the fuzzy "halo" around text and graphics. #04424



\$139

Space Saving LaserStand

Space saving printer stand stores and organizes two full reams of paper, envelopes, cassette trays and more. Unique cable management system protects and hides power cables and network interface boxes. Designed to match LaserWriter II but accommodates any printer of comparable size up to 75 lbs. Sturdy metal inner structure raises printer 7 1/2". #04427



\$128

THE COMPLETE KENSINGTON PRODUCT LINE**CABLES**

3360	Mac II Monitor Cable Ext. Kit	32
3359	Xtra Long ADB Keyboard Cable	24
COMPUTER EQUIPMENT COVERS		
2978	Dust Cover SE Ext. Keyboard	9
329	Keyboard Shelf Compact Mac	39
330	Keyboard Slideaway	34
3361	Dust Cover SE Std. Keyboard	9
3362	Imagewriter II Dust Cover	9
4688	Basic Briefcase 64071	44
4689	Slip On Case (Powerbook) 64070	14
4690	Deluxe Briefcase 64072	79
SECURITY		
3676	Pass Proof (Cx,Ci,Left Drive)	70
3660	Pass Proof (For Se Type Cases)	70
4419	Pass Proof Classic 64062	70
3357	Laserwriter II Security System	32
2979	Apple Security Kit System	32

STANDS

4427	Laserstand-Mac 62578	128
2539	Mac II Stand (No Cables)	19
3353	Macintosh II Monitor Stand	64
3354	Macintosh IIfx Monitor Stand	49
3350	Printer Muffler 80	43
4425	Printer Muffler 80 Stand	19
4426	Space Saving Printer Stand	19
2975	Super Base	31
2976	Tilt Swivel For SE Or SE/30	21
3355	Universal Copy Stand	22
2977	Universal Printer Stand	15
3495	Kensington Side Clip	6
SURGE PROTECTORS		
3339	Power Tree 10	19
3342	Power Tree 20	27
3343	Power Tree 50	54
3338	Masterpiece Mac II	105

SURGE PROTECTORS (CONT.)

3345	Power Backer 360	26
3346	Power Backer 450	33
3347	Power Backer 520	39
3348	Power Backer 800	74
3349	Power Backer 1200	94
TRACKBALL		
4421	Custom Color Track Ball-Purple 62374	1
4420	Custom Color Track Balls-Black 62371	1
4422	Custom Color Track Balls-Blue 62373	1
4423	Custom Color Track Balls-Red 62372	1
1292	Turbo Mouse (512K & Plus)	10
1411	Turbo Mouse ADB	10

LSOP Disk Files

veniently preserve and organize your 3-1/2" disks with the Allsop Disk File organizers which provide an efficient way of accessing and storing your 3-1/2" computer disks. The innovative design provides a built-in handle for easy transport, adjustable dividers for categorical filing, and specifically built with high-quality materials for maximum disk protection.



\$7

AMERICAN POWER CONVERSION SurgeArrest

By combining capacitors, multiple varistors and toroidal chokes, SurgeArrest units provide the ultimate in AC and phone line protection. In fact, each SurgeArrest has achieved the best UL 1449 TVSS rating of 330 VL-N, 330 V L-G and 330V N-G. The SurgeArrest family incorporates three levels of protection; SurgeArrest, SurgeArrest PLUS EMI/EFI filters, and SurgeArrest PLUS with Tel, which includes phone line suppression and a lifetime Equipment Protection Guarantee.

#04574 SurgeArrest

#04575 SurgeArrest Plus \$34

#04576 SurgeArrest Plus with Telephone \$59

\$17

TRAVEL WITH YOUR MAC SAFELY WITH I/O DESIGN CASES



Ultimate Classic/SE Case

#03905 **\$68**

Ultimate Classic/SE Extended Case

#03794 **\$74**

Ultimate LC Case

#00721 **\$94**

- 1. 9"x9"x3" padded pocket for mouse, cords and accessories. (Not on all models)
- 2. Padded flap separates hard disk from computer.
- 3. Padded handle for comfort; features Velcro enclosure.
- 4. 2" Stiff nylon webbing maintains support.
- 5. Outer Handle assists in shoulder carrying.
- 6. Flush side pocket.

- 7. Shoulder strap with slip-stop pad.
- 8. 9"x12"x1" padded pocket for modem, disks and accessories.
- 9. 5/8" super high density foam padding for the "ultimate" in protection.
- 10. Heavy duty high tech hardware throughout.
- 11. Stress point cross & box stitched for added support.
- 12. Padded compartment fits any keyboard.
- 13. Lifetime Warranty.

Put your compact Macintosh into the Ultimate Classic/SE Extended carrying case and you can take it anywhere. This premium-quality case pampers and protects your Mac with its high density foam padding. The sturdy Du Pont Cordura Plus™ nylon exterior looks great and keeps the weight down. Inside, you will find a padded compartment for your keyboard (any model), mouse, external hard drive and cables. Two exterior pockets hold everything from manuals and floppy disks to sweaters and umbrellas. Now available in black, blue, and two hot new colors, Magenta and Aqua.



TARGUS

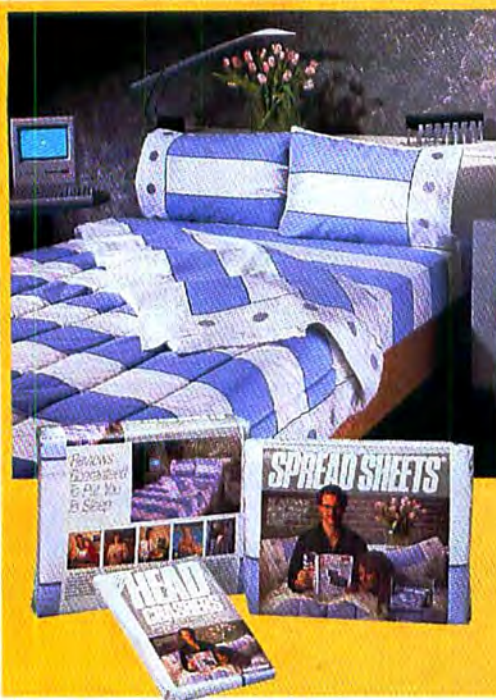
Premier Macintosh Case

Perfect for Mac SE and Classic. Features a padded compartment for your Mac, external hard drive and removable padded case for the extended keyboard. Portfolio section provides Velcro-secured disk pockets, mouse and cable pockets and pen and business card holders. "Zilicone" treated Oxford nylon outer shell is water repellent, scuff resistant and won't wear against clothing. Removable shoulder strap with hand grips. Nonskid shock-absorbing rubber feet. PVC-backed materials throughout provide anti-static qualities.

Lifetime replacement warranty. Available in black, navy, burgundy and gray.



\$74



BEDWARE SpreadSheets & HeadCrashers

The perfect gift for computer lovers! SpreadSheets are complete, fitted bed sheet/pillowcase sets in the popular blue-bar, tractor feed printer paper design. And the package is half the fun. HeadCrashers are the same pillowcases, but sold separately. They're all quality 180-count percale 50/50 cotton/poly. #04558 Twin Set #04557 Queen Set \$35 #04556 Pillowcases \$13

\$26

TWIN SET



COSTAR Stingray

Stingray lets you work faster and with more comfort than any other pointing device. The Stingray combines all the comfort of a low profile mouse with the advanced features of a high precision trackball. The result is unmatched ease of use and comfort. You'll be amazed at how fast you speed across your screen and through your applications with the Stingray. #00524 - Platinum #00523 - Black

\$88

SOPHISTICATED CIRCUITS

PowerKey with Quickeys Lite

PowerKey turns on your Macintosh and peripherals from the keyboard and also shuts down from the special menu. It can be programmed with an on/off schedule, useful for communications and backup applications. Its four outlets provide surge suppression, noise filtration and overload protection. Remote option lets you turn on your system with a single phone call. PowerKey works with any Macintosh ADB equipped Macintosh. Bundled with Quickeys Lite! #04604 #04669 Quickeys Lite \$31

\$63



DATADESK INTERNATIONAL MAC-101E

MAC-101EQ is both the MAC-101E keyboard and Quickeys 2.1 macro software that includes the power of Apple Events. Successor to the best-selling MAC-101 keyboard, the MAC-101E is renowned for tactile-feedback keys that give you the "touch and feel" for faster typing with fewer mistakes. Utilizes the extended 105-key layout with built-in function key template system. #04318

\$149



MICROTOUCH SYSTEMS

UnMouse

The UnMouse is the intuitive touch tablet that lets you work both productively and creatively. To move the cursor, just slide your finger over the glass and press to click. It's the fastest device around - especially in Absolute mode with one million touch points mapping precisely to the screen. Just point to a location on the tablet and instantly the cursor will appear in the same location on the screen. And it's the only device that also works as a Power KeyPad with well-labeled templates which slide under the glass. Simply press down on a key to execute a command, macro or any combination of keystrokes. #03412

\$159



\$49

TRIPPLITE ISOBAR Surge Suppressor

ISOBAR is the world's best-known, best-selling and most advanced surge suppressor. Gold Seal Warranty covers your Gold Seal product and connected equipment for life. Isolated filter banks and "cascade" circuitry provide premium surge, spike, and noise filtering. Command Console fits neatly between computer and monitor. #04605



TRIPPLITE MacDirector

The first power protection console designed exclusively to match the look and feel of the Macintosh SE/Classic. Contains PC Magazine Editor's Choice circuitry. Includes modern protection. One year warranty. #04607

\$89

NO GIMMICKS - NO HIDDEN CHARGES

The Mac Zone
Established 1980

TrackMan

TrackMan is the revolutionary new input device for Macintosh that combines the advantages of both a mouse and a trackball. With three buttons, TrackMan offers Macintosh users a range of flexibility they've never seen before! #00550

- Thumb-operated ball for extra precision
- Hand-fitting design for ease of use and comfort

- Requires very little desk space
- Adjust resolution from 150-300 dpi for extra precision or speed
- Control Panel software makes it easy to program buttons for keystrokes and shortcuts
- Perfect for use with Macintosh, A/UX and X-Windows Operating Systems

\$84



ScanMan Model 32 with Digital Darkroom

ScanMan and Digital Darkroom together provide a lot of functionality without sacrificing affordability. In minutes, you can have a picture (black and white or gray) in your favorite word processor or page layout software, at a price everyone can afford!

Logitech Scan Pad #513 \$12

\$295



Mouse Man

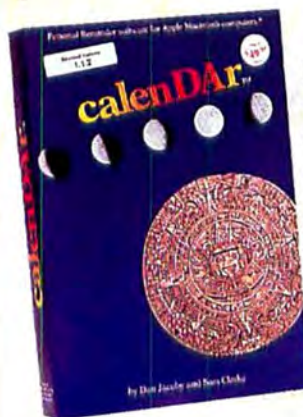
Until now, Macintosh users had few choices in their input devices. If a one-button mouse or large trackball didn't work for you, you were just out of luck. But now, Logitech offers a high resolution ergonomic mouse. MouseMan provides comfort, three buttons and enhanced tracking in a format that moves smoothly around your desktop. MouseMan features include:

- Precise cursor control
 - Efficient use of desk space
 - Plug-in compatibility
 - High resolution
 - Reliability
- #04258

\$76



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PSYBRON calenDAr

calenDAr is a desk accessory calendar. This brilliant full color DA keeps track of all those things you want to be reminded about. Birthdays, anniversaries, schedules, appointments, things to do, important dates, etc. It reminds you as instructed, no matter what applications you are running. In addition to your own personal reminders, calenDAr keeps you posted about civil and religious holidays so that you avoid planning conflicts. #04268

\$24



VISIONARY SOFTWARE First Things First

Time is on your side with First Things First - FTF is the Mac's fastest and easiest time management utility. You'll enjoy the total convenience of FTF's revolutionary floating clock-icon for instant access to priorities, reminders, appointments and multiple to-do lists. Stay on top in the fast lane with First Things First! #04448

\$44

SUITCASE II FROM FIFTH GENERATION



FIFTH GENERATION

Suitcase II v1.2

Suitcase II expands your font and desk accessory menus, giving you access to as many as 255 items in each. Once Suitcase II is running, you can install and use any font, DA or FKEY just by using Suitcase II to bring it in. Its most delightful feature is its ability to autoload font/DA files at startup. When Suitcase starts, it looks for files or folders named Fonts, DAs, and Fonts/DAs. If it finds and it opens them automatically. #02002



\$48



QuickDEX™

Free Form Database Desk Accessory
...with Autodialer™



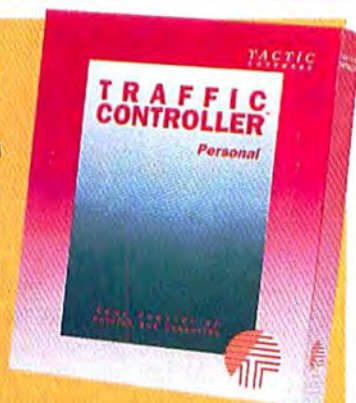
TACTIC SOFTWARE

Traffic Controller Personal

With System 7 you get powerful document linking capabilities with Publish and Subscribe. Once you begin using Publish and Subscribe you will notice how it will become difficult to keep track of all the data moving between applications. Traffic Controller Personal provides a graphical representation of each Publish and Subscribe Edition. It also has the following features:

- Have access to any current or past copy of an Edition.
- Move Editions to the clipboard for further manipulation.
- Date and Time stamp each Edition iteration.
- Give name and location of the Publisher's application.
- Works with Text files, PICT files, and even sounds.
- Indicates if an Edition is orphaned.

#04218



\$84

CASSADY & GREENE

QuickDEX

QuickDEX is the fast and painless way to your data right under the Apple menu. QuickDEX stores data in "card decks." It fits in the QuickDEX menu, but you can have as many as memory allows. Files are compact and searches are speedy. QuickDEX is also smart enough to find and dial the phone number on a card when you click the Dial button. It also prints Rolodex cards and mailing labels. #04700

\$39

The Mac
Zone
Established 1980

ORDER BY 9PM E.T. WEEKDAYS, WE SHIP SAME DAY



14326 MacPalette II AppleTalk \$204

MICROSPOT
MacPalette II
 Turn your ImageWriter II into a FULL COLOR printer—producing over 250,000 colors from just a four-color ribbon. This Chooser-level printer is easy to operate with on-line help dialog boxes. Also available is gray scale output using a black ribbon and scaling from 10 to 1000 percent. Compatible with any of the Macintosh II series, the Mac LC and the SE/30 and most Macintosh software.
 #00818

\$54



GOLDEN RIBBON
Imagewriter Ribbons

MacZone offers only quality printer ribbons made in the USA. Each ribbon is made with the highest quality materials available and is designed to meet or exceed the original manufacturer's specifications. MacZone also offers a complete line of color printer ribbons including brown, blue, green, red, purple, yellow, orange, silver, and gold. Every MacZone printer ribbon will give exceptional print quality and the long life you expect with the largest selection of colors available.

From \$4



\$127



GIZMO TECHNOLOGIES
ShadowWriter
 ShadowWriter is the latest software product that allows low-cost personal printers to be shared by all the Macs on a network. It installs in minutes to transform an inexpensive solo printer into a shared printer that any Mac on an AppleTalk-Compatible network can use. Share your StyleWriter, Personal LaserWriter LS, Personal LaserWriter SC, or LaserWriter IISC on the network!
 #04159



INSIGHT DEVELOPMENT
MacPrint

Print any Macintosh application on many different printers. MacPrint is a chooser-level program, completely transparent in operation. It displays all your printer's resident fonts on screen. If none is found, it creates a printable font based on Macintosh QuickDraw screen font, maintaining spacings, style, and word wrap. What you see on the screen is what prints. Supports all internal fonts and font cartridges for HP and HP compatible printers like Pacific Data Products, Everex, Anacom and Computer Peripherals.
 #02423

\$93

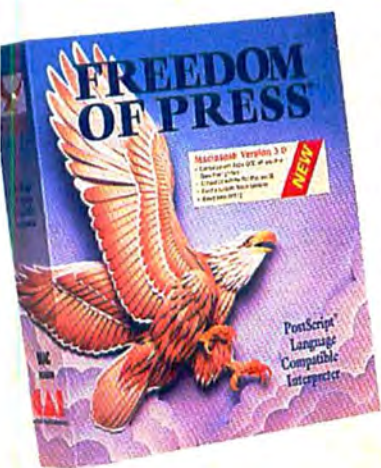
SUPER LASER SPOOL



FIFTH GENERATION SYSTEMS
Super Spool 5.0

Controls your printer in the background as you work in the foreground. Automatically processes your documents, sends them to the printer and even downloads fonts while you continue working. Gets your Mac back in seconds instead of minutes or hours!
 #01122

\$61



CUSTOM APPLICATIONS
Freedom of Press 3.0

With Freedom of Press a PostScript printer is not required to output PostScript files. You can now print them to non-PostScript devices like the Hewlett Packard LaserJet II, IIP and III, DeskWriter, PaintJet and Epson LQ Dot Matrix Printers. It comes with 35 scalable PostScript fonts and supports all additional fonts including Adobe Type I and new Microsoft True Type.
 #03209

Freedom of Press Light
 #03839 \$55

\$254



ALADDIN
ALADDIN SYSTEMS, INC.

SHORTCUT

BY RAYMOND LAU

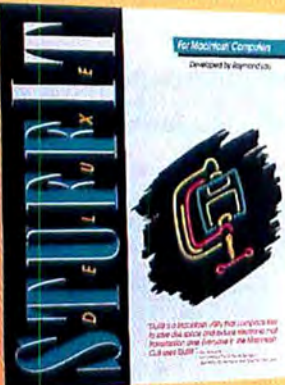
ALADDIN SYSTEMS Shortcut 1.5.2

Shortcut is a disk management utility that appears in every program's Open and Save dialogs. There you can quickly jump between

documents and folders or

find lost files within seconds. When saving any document, Shortcut lets you create folders for your new work. And there's more - anything you need to do within an Open or Save, Shortcut is your utility. A MacUser 5 mice winner. #02986

\$45



Stuffit Deluxe

Stuffit Deluxe is the easy-to-use Macintosh standard for compression, encryption and archiving. Files can be compressed up

to 98%, with 50% the average. Stuffit Deluxe comes with Finder Extension that makes compression as simple as clicking on any file, folder, or disk icon. A MacUser 5 mice winner. FREE upgrade to 3.0 #03458

\$61

ALYSIS

SuperDisk

SuperDisk is a system enhancement that effectively enlarges your hard disk through ultra-high-speed compression. Once it is installed, SuperDisk compresses and decompresses applications and data files automatically - transparently enlarging your hard disk. It offers the highest throughput and the greatest compatibility of any compression option available for the Macintosh. SuperDisk is the ONLY compression product that works with

\$59

programs like Disinfectant Virex™, On-Location™ and with files like control panels, INITs and desk accessories. It creates auto-expanding files and secures compressed files with two levels of password protection. #00512

ALYSIS

SuperDisk!



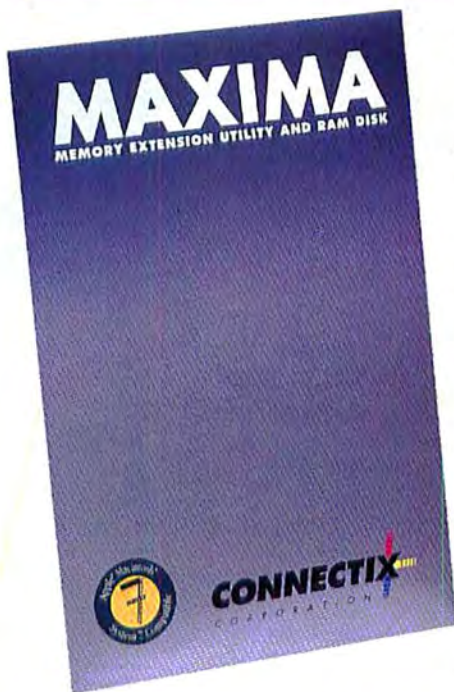
CONNECTIX

Maxima 2.0

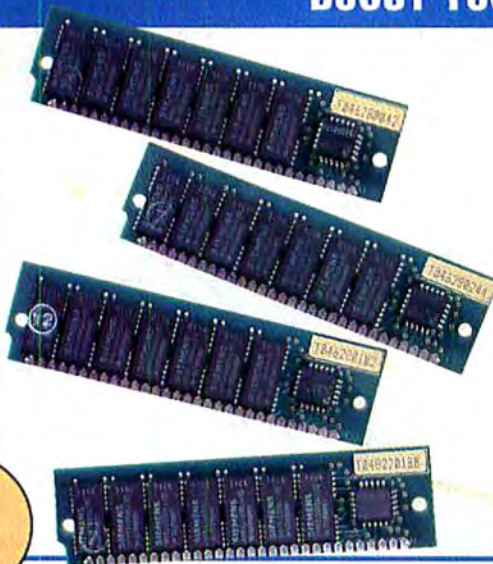
The versatile memory extension utility for Macs with 8 or more MB physical RAM. Creates 14 megabytes of enhanced 24-bit addressing. It also offers independent RAM disks for both 24- and 32-bit mode in either System 6 or System 7. Take full advantage of the power of your 4MB SIMMs with all your applications. #04144

#04013
MC73 \$148

\$44



BOOST YOUR MAC'S RAM WITH SIMMS



**1x8x80ns
SIMMS**

\$49 per Mb

#03586	1Mb NTX.....	\$49
#03579	4x 1Mb Fx.....	\$169
#03585	4x 4Mb Fx.....	\$759
#03583	4x 4Mb.....	\$639

NO GIMMICKS - NO HIDDEN CHARGES

**The Mac
Zone**
Established 1986

SCREEN SAVERS BY BERKLEY SYSTEMS



BERKELEY SYSTEMS

More After Dark (M.A.D.) & After Dark Bundle

It's M.A.D.! It's More After Dark - over 25 incredible new displays for After Dark, the Ultimate Screen Saver. Features contest winner Mowin' Man, Tunnel, GraphStat, and many beautiful new fish! Crazy Kittens, Art Museum, and Lunatic Fringe game module help save your screen from phosphor burn-in. Requires After Dark. Bundle #04046

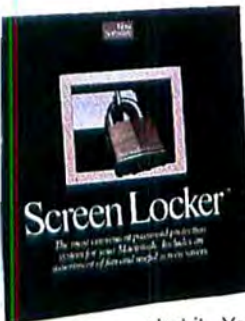
After Dark 2.0

Plus After Dark, the Ultimate Screen Saver Collection. Over 35 displays including classics Flying Toasters and Fish! With sound, password protection, logo and message display. #02785

\$28

More After Dark
#04053 \$24

\$41



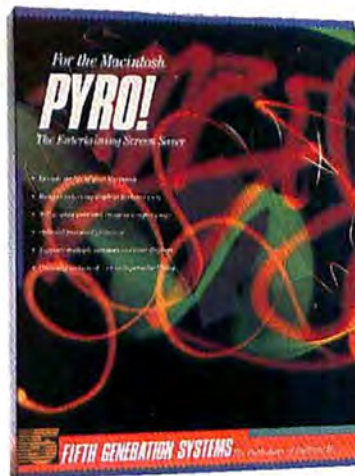
NOW

Screen Locker

Now you don't need to worry when you leave your Macintosh unattended. Screen Locker™ protects it 24 hours a day, seven days a week. Best of all, you don't even have to remember to turn it on. Reliable - Screen Locker won't let anyone see what's on your Macintosh unless they have your password. Period. Even if they re-

start it. Your Password and Backdoor Keys are den and encrypted, so it's virtually impossible for intruder to discover them. Watchful Management - The time, date, and result of every break-in attempt is logged and can be viewed or printed. #522

\$44

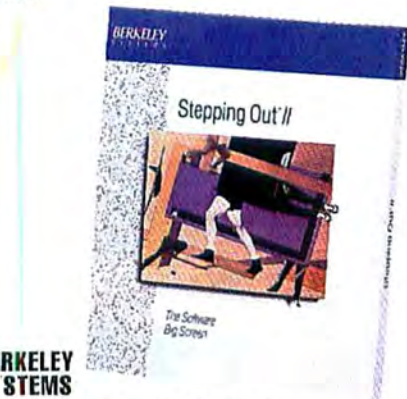


FIFTH GENERATION

Pyro 4.0

Pyro belongs on every Mac to prevent screen damage. Images left on-screen for too long can burn a permanent image into the phosphors. Pyro automatically substitutes a variety of user-selectable graphic routines designed to keep damage from happening. Touch any key or nudge the mouse to bring the original display back. #02194

\$24

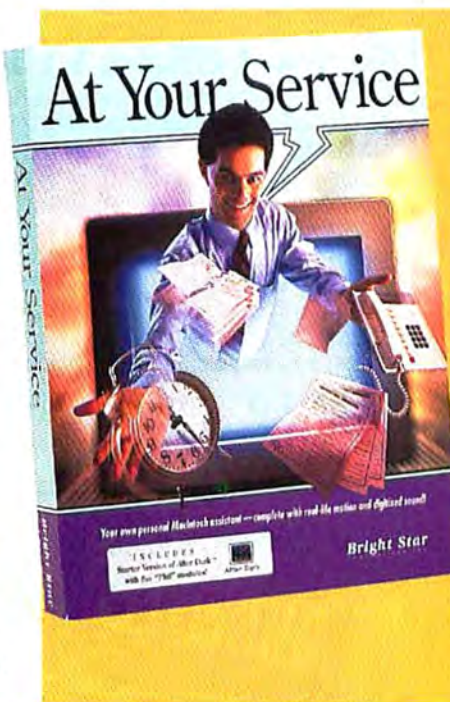


BERKLEY SYSTEMS

Stepping Out II

Stepping Out II is software which extends the capabilities of the standard Macintosh® display give it the same feel and features as a big screen. With Stepping Out II, you choose the screen size that is most comfortable for the task at hand. You can work with a part of the big screen at normal size or with the whole screen reduced. For detail work you can enlarge any portion of the big screen up to sixteen times. #01600

\$54



BRIGHTSTAR

At Your Service

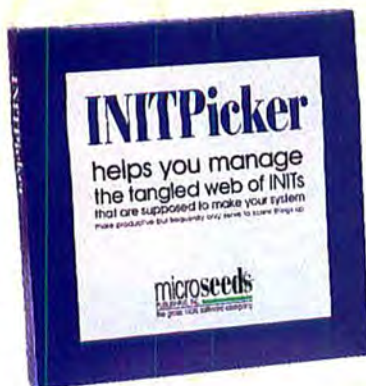
Give your Mac real personality with Phil - your "talking" Personal Assistant. Phil reminds you of appointments, notifies you when E-Mail arrives, monitors keyboard and mouse activity to suggest when to take a break, and gives full system report. Includes a starter version of After Dark, along with five unique modules. And now, add new faces and voices to At Your Service with BrightStar's Catalog of Actors. Choose from Laura, Gabrielle, Mack, Jeeves, Madeline, and The Boss. Six new ways to personalize your Mac like you've never seen - or heard - before! #00415

\$30

#04435
Catalog of Actors \$10

SCREEN UTILITIES

OPEN 24 HOURS • CALL: 1-800-248-0800

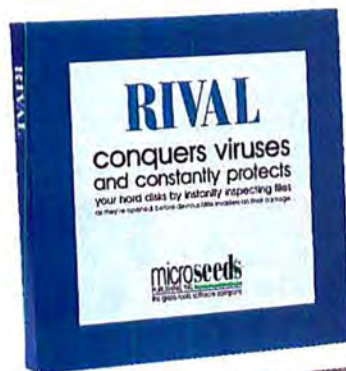


MICROSEEDS INITPicker 2.0

INITPicker 2.0 helps you manage the tangled web of INITs that are supposed to make your system more productive but frequently only serve to screw things up. #02191



\$35



MICROSEEDS Rival

Rival makes virus detection simple, painless, and automatic. Instead of nagging you with endless disk scans, Rival quietly checks each file as it's opened, and only alerts you if it actually finds an infected file. Rival is inconspicuous yet absolutely safe and effective, since viruses are detected and removed before they have a chance to spread. Of course, you can always use Rival to scan files, folders and entire disks whenever you choose. #03327

\$54

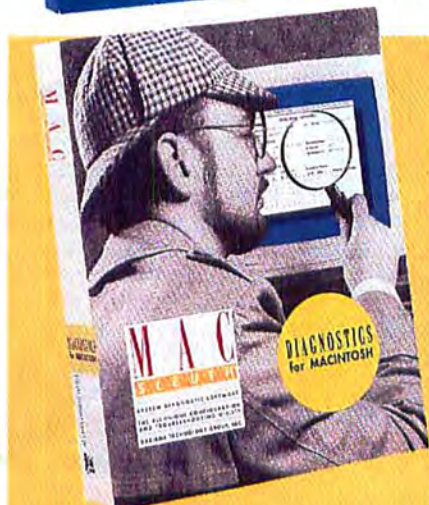


MICROCOM Carbon Copy Mac

Absolutely the best value in remote control, at the best price. You can direct another Mac's screen, keyboard, and mouse, or exchange files from anywhere. Its ideal for working away from your office. Plus, Carbon Copy has powerful password protection and includes the Virex INIT for virus-free file transfer. Two copies are required. Carbon Copy Mac is ideal for training users, collaborating on projects and supporting and troubleshooting your AppleTalk network. #04127

\$62
\$199

#04409 Unlimited Network Version



DARIANA TECHNOLOGY GROUP, INC. MacSleuth

MacSleuth is the first comprehensive systems analysis program for the Apple Macintosh. Supplies the user with a wealth of data about the system under examination. MacSleuth features include hardware information—showing the video interface, details about the sound subsystem, SCSI interface, the Apple Desktop Bus and Nubus slots. Startup information displays the boot volume directory and version number, System, Finder and Debugger names, application file names and System zone sizes. #03799

\$85

PROTECT YOUR WORK WITH A SYMANETC BUNDLE



SAM 3.0

The Symantec Anti-Virus for Macintosh detects viruses by monitoring the suspicious activities that characterize them. The INIT portion acts like a watchdog during startup to detect viral activity. The CDEV portion operates during normal Mac usage and offers a number of options for checking disks and folders as you work. SAM has an Audit Trail to keep track of its activity and your responses.

Norton Utilities V1.1

Norton Utilities for the Mac gives you an unbeatable combination of disk and data recovery software, along with disk optimization utilities. Now you can keep your valuable disks and data safe, secure and operating smoothly. It provides three levels of unerase, designed to give you optimal recovery options. The advanced diagnostic routines dig deep into the Mac operating system tool box to search for and recover lost data in minutes. With the Norton Utilities you can even unformat an accidentally-formatted hard disk. You also get Speed Disk, a powerful disk defragmenter and optimizer to significantly increase system performance by reducing data access time.

SAM 3.0 - Norton Utilities V1.1 Bundle

#04341



\$119



SATURDAY AIRBORNE EXPRESS DELIVERY MOST DESTINATIONS

The Mac Zone
Established 1984

W SOFTWARE

ow Utilities

According to MacUser, "Now Utilities must-have for experienced users & novice users alike." Included in collection are: Super Boomer, rated as the best of the Open & the dialog box enhancers; StartUp Manager, the most powerful extension manager; and WYS/WYG nus, which groups font families together in their own typeface. Plus: NowSave, Screen Locker, AlarmsClock, Profiler, MultiMaster, DiskPicture, and NowMenus! All components are System 7 compatible. #04191



\$84

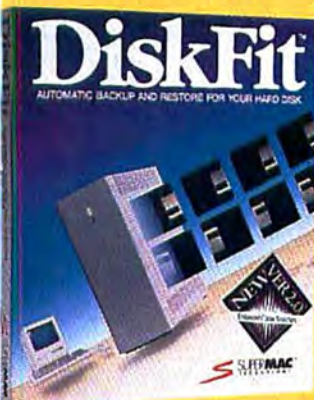


DANTZ Retrospect 1.3

Schedule automatic, unattended backup to any tape, optical or cartridge drive with Retrospect's calendar launch features. Liberate valuable hard disk space by archiving inactive files until needed. For the network manager, Retrospect Remote backs up an entire network of

Macintoshes to a single storage device, without remote user action or interference. Security is maintained by extensive password protection and optional data encryption. Add additional users with Remote 10-packs. #02586

\$146



DANTZ DiskFit Pro

DiskFit Pro is a handy utility for backing up your hard disk on a series of floppies. DiskFit saves time. It backs up only those files which have been changed since the last backup. It can verify each floppy after copying files onto it, so you know your files are safe. DiskFit also discards old versions. #04722

\$69

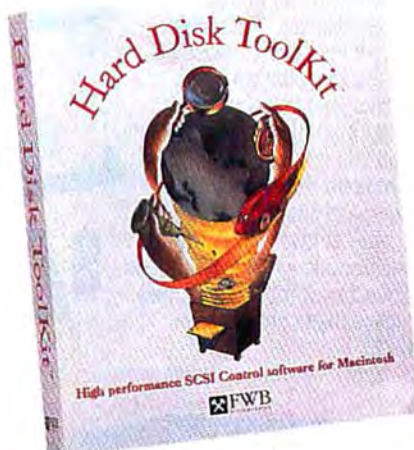


SYMANTEC SUM II

SUM II™ is a completely new version of the award-winning Macintosh utility program. This version offers all of the power and usefulness of SUM Version 1 while incorporating an entirely new interface, three new utility programs, and added features in every other utility. SUM II is the most powerful set of utilities available for ensuring that your data is safe, secure, and efficiently organized. #02754

\$95

TOTAL SCSI CONTROL BY FWB

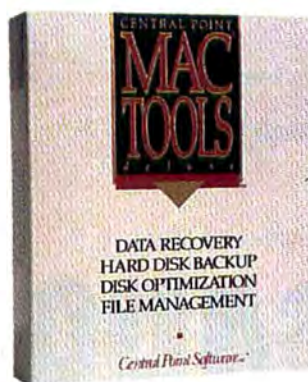


FWB

Hard Disk ToolKit™

Hard Disk ToolKit™ replaces your SCSI hard disk or removable drive's original installer with a sophisticated multi-module SCSI utility package that gives you total control over your SCSI world. It is easy to use, yet offers the performance, power, and flexibility demanded by sophisticated users. #00555

\$139

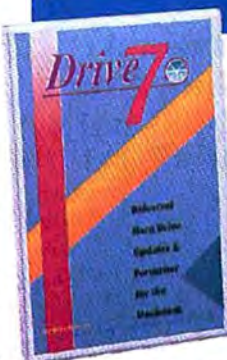


CENTRAL POINT SOFTWARE

Mac Tools Deluxe

Mac Tools provides utilities for data recovery, file protection, and disk management. You can make backups of your hard disk whether on Apple tape drive or a set of floppies. Other utilities in the collection undelete accidentally erased files, recover damaged files, compress files, defragment files, and encrypt them. A DA finds "lost" files fast. #03481

\$78



A MAC ZONE EXCLUSIVE!

CASA BLANCA WORKS, INC.

Universal System 7 Formatter/Updater

Did you know that Apple's hard drive formatter works only on Apple drives? And most third party drivers are incompatible with any other drives? Drive7 formats and updates most third party as well as Apple drives, freeing you from taking chances on 7.0 compatibility. Provides customized partitions, VM on Macs

and Syquest, passwords, locking, and more! If you have multiple hard drives, you need Drive7! The most versatile and affordable formatter available. #04472

\$44

OPEN 24 HOURS • CALL: 1-800-248-0800

HARD DRIVE UTILITIES

COMPUTER PERIPHERALS

Viva 9642e V.32/ V.42 bis Modem

The ViVa™ 9642e is a V.32, 9600 Baud modem that means business. This high speed, full duplex modem has V.42bis and MNP5 data compression, plus V.42 and MNP4 error detection and correction. All this adds up to maximum throughput rate of 38,400bps, saving you time and money! The ViVa 9642e modem has sophisticated features like auto-speed adjustment, auto-speed buffering, auto-software or hardware flow control, synchronous and asynchronous operations. Unique "tower" design occupies 65% less desk space than conventional modems. #04272



\$419



DOVE

DoveFax LAN

Hardware Features: Combines a 9600 baud fax & 2400 baud Hayes compatible data modem. CCITT Group III compatibility provides access to over 95% of fax machines worldwide. G3 Compatible External or Internal models

Software Features:

- Multiple users send faxes via network server
- Does not require a dedicated server
- Full background send and receive capabilities
- Auto receive and retry
- Customizable cover pages
- Automatic report logs fax activity
- On-screen display of faxes with magnification option
- Fax preview option

#04756



\$499



US ROBOTICS Sportster 2400 with MNP 1-5

The 2400 bps modem that gives you industry standard MNP Levels 2-4 error correction.

Under MNP, the data arrives 100% error-free, even if the connection is less than perfect. With MNP Level 5 data compression, you can transmit at up to twice the speed of a regular 2400 bps modem. That can save you up to 50% on phone calls where you're sending files.

#04606

\$159

NETWORKABLE FAX BY CYPRESS RESEARCH



\$999

CYPRESS RESEARCH

FaxPro Networkable Fax

The FaxPro Networkable Fax System allows all Macintoshes on a network to send and receive faxes from a single or multiple shared FaxPro modem. FaxPro comes complete with all required software for connecting an unlimited number of Macintoshes.

E-mail and gateway software are not needed with the FaxPro system to operate on a network. Specifications include: 9600-b send and receive Group III-compatible fax modem, 2400-baud hayes-compatible data modem (data modem is not networkable), automatic fax/data modem switching, auto-queuing of network fax jobs, fax status reported across the network, auto-archiving network incoming/outgoing fax log, address book software, fax viewing and printing. #04585



LEXUS

2400 Turbo Lexus Modem

Intelligent, compact 2400 baud modem. Fully compatible with Hayes AT command set. Easy to install and ready-to-use, all cables included. All the features you need in a modem, including auto answer, auto and Advanced Diagnostics for error checking. Eight front panel LEDs let you know what the modem is doing. Compatible with all major communications software. Comes complete with everything you need to get started, including, MacKnowledge 1.02 MZ communications software, special introductory membership to CompuServe and Genie. #00028

\$89

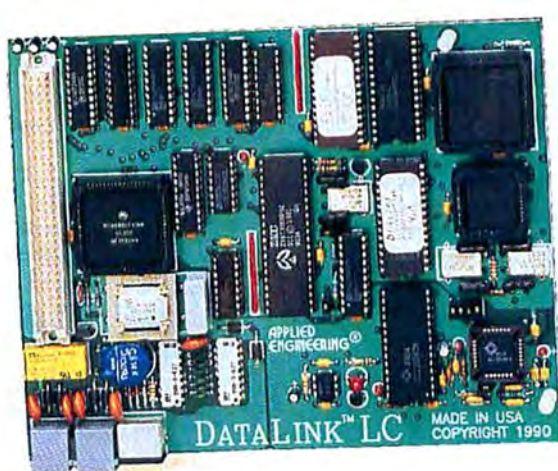
The Mac
Zone
Established 1984



BEST DATA Smart One 2400 XMAC Modem

The Smart One 2400XMAC - Stand Alone Modem for Macintosh Plus and SE is a complete communication package for beginners and experienced modem users alike. Incorporating the latest in CMOS technology, Smart One runs cooler, lasts longer and uses less energy than other modems. Best Data Products has included software, cable, technical support... everything you need for immediate hookup! #04243

\$99



APPLIED ENGINEERING DataLink LC

The DataLink LC is a networkable, Hayes compatible, V.42bis, 2400/9600 data/fax modem. It includes an extra serial port, Send & Receive Fax software and more than \$200 in one-line offers, 68882 math chip optional. 5 year warranty. #04579

**FREE
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PLACED
BETWEEN
6 & 4
PST**

\$299

LISYS eFax

Now you can send or receive faxes directly from your Macintosh and a 16 level half-tone scanner and a 200 dpi printer all in one very convenient and portable package. AutoFAX software includes powerful graphics editing capabilities for scanned or red documents. #0256

\$669



\$148



HAYES Personal Modem 2400 Plus

Personal Modem 2400 Plus and Smartcom for the Mac.

Ready to go on-line? Here's the solution in one package.

Everything you need - 2400 bps modem, communications software, and telephone and computer cables. You'll be on-line in a matter of minutes after opening this value-packed package. Perfect for offices at home, at school, or for remote office site. #00451

POWERFUL PROMODEMS FROM PROMETHEUS

ProModem 2496S/R Minifax

Why pay more for a large sized modem when you can get everything you need in a unit half the size and price? The

ProModem mini line offers features like V.42bis MNP-5 data compression and error correction in data and data/fax modems that save valuable desk space and money! With different versions available, you can select one that meets your particular needs. All include MACKNOWLEDGE™ communications software and cable; fax modems also have the new 3.0 fax software. #04596

#04416 ProModem 2400 Mini Plus (data-only, V.42bis/MNP-5) \$123



\$269

GLOBAL VILLAGE TelePort Fax 24/96

Send faxes with the push of a button. TelePort plugs into your ADB connector (like your mouse and keyboard), eliminating a power adaptor, freeing your serial ports, and enhancing portability. TelePort, 2400 baud Hayes compatible modem, incorporates MNP5 data compression/error corrections. Eddy Award 1990 #00395



\$184



PACER SOFTWARE PacerTerm

PacerTerm combines today's standards - Apple Comm Toolbox and HyperTalk scripting - with the best collection of file transfer (FTP, Kermit, XMODEM, ZMODEM) and connection protocols (TCP/IP, LAT, Modem and Serial). Flexible, easy-to-use features like keyboard remapping, on-screen SoftKeys, and multiple VT320 terminal windows, allow PacerTerm users to create powerful front-ends to host applications and on-line services. Apple calls it "Macintosh networking at its best!" #04163

\$159

PacerForum

PacerForum makes it easier than ever for your workgroup to collaborate and communicate - MacWEEK calls PacerForum "a very useful tool that will greatly facilitate office communication." PacerForum provides easy and efficient distribution of information on any AppleTalk network. Its interactive bulletin board lets you attach files, pictures and sounds to create messages that get results. #04473

\$349

PacerForum

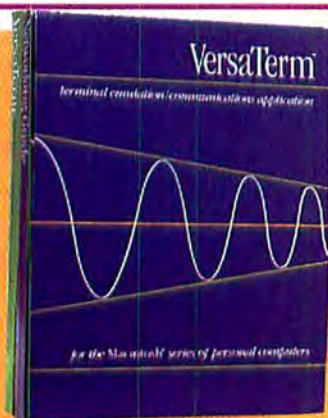


FREESOFT CO.

White Knight II

White Knight is a powerful general-purpose telecommunications program that packs in almost every imaginable feature. It combines technical sophistication, flexibility, user-friendliness. White Knight takes strong advantage of the capabilities of 128K ROM's, which means that it will run on a Mac Plus, SE, II or later machine. #02881

\$84



SYNERGY VersaTerm V.4.5

VersaTerm offers DEC VT100, VT220 and Data General D200 test emulations, and Tektronix 4010/4012/4014 graphics emulations. A system 7.0 "savvy" application which supports Apple Events and the Edition Manager's Publisher. VersaTerm comes with a

complete set of tools and INITs, including MacTCP (TCP/IP), Telnet and FTP tools, LAT (DEC VMS Ethernet), ADSP (Apple Talk Data Stream Protocol, plus serial and modem tools. File transfer capability includes: FTP (Client and Server), XModem, YModem and Kermit. VersaTerm supports LocalTalk, Ethernet, modems or direct connections. #00643

\$87



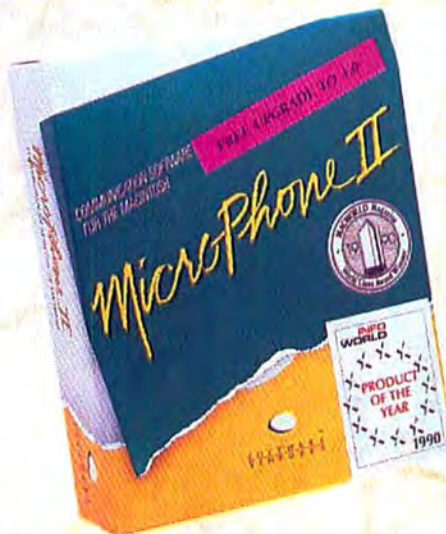
LEXUS

2400 Turbo Lexus Modem

Intelligent, compact 2400 baud modem. Fully compatible with Hayes AT command set. Easy to install and ready-to-use, all cables included. All the features you need in a modem including auto answer, auto Dial and Advance

Diagnostics for error checking. Eight front panel LED lights let you know what the modem is doing. Compatible with all major communications software. Comes complete with everything you need to get started, including, MacKnowledge 1.02 MZ communications software, special introductory membership to CompuServe and Genie. #00028

\$89



SOFTWARE VENTURES MicroPhone II 4.0

MicroPhone II V.4.0 delivers communications without the hassle. Ideal for international telecommunications. Praised for ease of use and advanced scripting language, MicroPhone II 4.0 now contains faster script execution, screen speed, file transfers and new interface design tools. Supports ZMODEM transfer protocol and can operate modem any speed from 50 to 57,600 baud. It includes predesigned front-ends that put you touch with MCI Mail, CompuServe, Dow Jones, and other info services. #01902

\$209



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The Mac
Zone
Established 198



ARCOBY SOFTWARE

Run PC Network

Connect your Mac to an IBM PC compatible and run virtually any DOS program in a Mac window. DOS programs run on the PC, but are viewed and controlled with the Mac. Run programs at full speed, even programs using VGA graphics and extended/expended memory. Includes Software Bridge/Mac for document translation. RunPC/Network connects one of 10 Macs to a PC via modem and the included serial cable.

#241

**\$279****Software Bridge V. 2.01**

Imagine being able to edit DOS documents in your Mac format just by double-clicking them! With SB/Mac you can. Simply double-click on a DOS document and SB/Mac identifies, translates, and launches it into your Mac format, ready to edit. SB/Mac also translates Mac to Mac, Mac to DOS or even DOS to DOS formats (over 30 major word processors are supported).

#03894

\$99**VersionTerritory™**Network
Updating
Software**SOFTWRITER'S
Version
Territory**

With Version Territory you can perform updates easier, faster and more reliable than with any other update method! Version Territory distributes documents, updates address books, installs startup documents, maintains consistent System Folders, distributes FONTS, and performs complicated installations easily.

#04126

\$339**ON TECHNOLOGY PRODUCTS****Meeting Maker**

MeetingMaker™ is a Macintosh network application that helps you plan, schedule and confirm meetings. You can schedule a time and date, select required guests, reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out activities, meetings, private work

\$314 sessions, even recurring weekly or monthly appointments in a single step. #04009

**Instant Update**

With Instant Update, your group works together on virtually anything that needs joint effort. You don't have the headaches of printing, copying, distributing, waiting, chasing down, editing, re-printing, and re-distributing all of your work; or the constant interruption of meetings and e-mail notifications. From proposals to to-do lists and creative brainstorming to



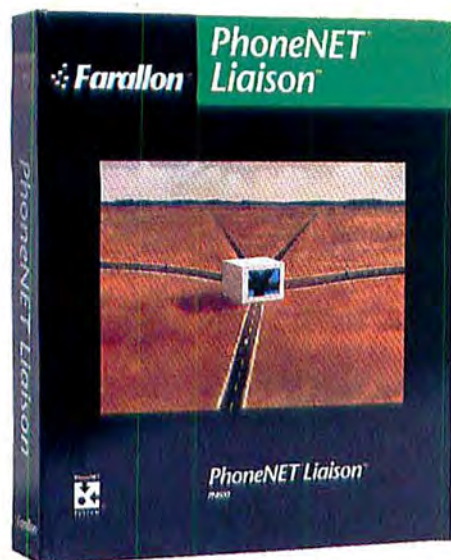
activity reports, Instant Update means that you've got the latest information whether you read it at nine in the morning or five in the afternoon. #04048

\$279**TECHNOLOGY WORKS****GraceLAN 2.0**

Technology Works' GraceLAN network management software lets you scan and profile every Macintosh, printer, PC monitor, NuBus Card, network peripheral or SCSI device on any size network - without leaving your desk! Now GraceLAN ver. 2.0 has added security, more detailed information and enhanced exporting capabilities with templates for Filemaker and Excel. GraceLAN ver. 2.0 is System 7.0 compatible, featuring balloon help, migration help and System 7.0 specific information, making it a great tool for migrating to System 7.0.

#04029

\$318**OPEN 24 HOURS • CALL: 1-800-248-0800**



FARALLON

PhoneNET Liaison

Liaison is a fully automatic software router that connects up to five different AppleTalk networks—including LocalTalk, EtherTalk, and TokenTalk—whether they're in the same building or hundreds of miles away. EtherTalk users can use LocalTalk printers. TokenTalk users can access EtherTalk file servers. Liaison even supports mixed AppleTalk Phase 1 and Phase 2 networks. Sharing network services and peripherals is cost effective—and so is Liaison, the software routing solution that doesn't require an expensive, dedicated hardware device. Just drop it in the System Folder to run it in the background on any Macintosh. Liaison also connects local area networks hundreds of miles apart. Attach a modem to a Liaison-equipped Macintosh at each site. Then just point and click in your personalized address window to dial up another network. Users on your network will see remote users as though they were in the same building. Liaison gives you a sophisticated password system to protect your network's privacy.

Assign dial-in users unique passwords, and then choose what level of network access to grant them. Liaison provides the economical software routing solution. #02483

\$258

FARALLON

Star Controllers

Manage and expand your network easier than ever!

Span greater distance - Star Controllers hub's patented circuitry amplifies LocalTalk signals up to 1Mbs.

In-band management - with StarCommand v3.0 software manage your StarController hubs from any Macintosh computer on their network.

Automatic naming - Port names are automatically assigned to the new hubs, view network names of computers and peripherals.

#4738 12 port StarController with StarCommand v3.0 **\$1049**

#4739 24 port StarController with StarCommand v3.0 **\$1349**

NEW!

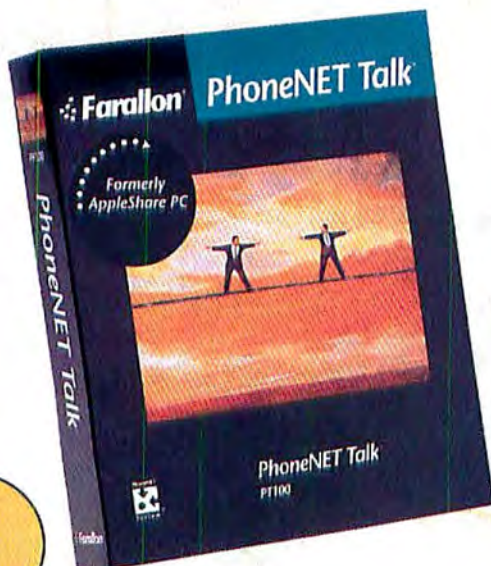
FARALLON

PhoneNET Management Software

The PhoneNET Manager's Pack provides all the software tools needed to map, troubleshoot, and maintain your network. Create a router connection graphic map with NetAtlas, to save for future comparisons. TrafficWatch II lets you analyze traffic protocols and error rates on Ethernet and LocalTalk networks. Search multiple zones and bridges with PhoneNet CheckNET 2.0. Two copies of Timbuktu 4.0 included to manage headless servers and support network users. #03900

\$668

(WHILE SUPPLIES LAST)



FARALLON

PhoneNET Card PC LocalTalk

The PhoneNET Card PC for LocalTalk (formerly Apple LocalTalk PC Card) allows users of MS-DOS and Windows personal computers to share high-quality laser printers, file servers, and other services available on an AppleTalk network.

#00353

\$208



The Mac Zone
Established 1981

INTERNATIONAL ORDERS CALL: 206-883-3088



EtherPrint
Dayna
EtherTalk to LocalTalk converter
For Macintosh Serial Printers

DAYNA

EtherPrint

EtherPrint connects LocalTalk printers to EtherNet Systems. You won't need expensive bridges or routers to connect your printer, because this low cost device EtherTalk signals to LocalTalk. If you need the speed and performance of EtherNet, you can still use your LaserWriter. Just insert EtherPrint between your network and your printer. It's so user-transparent you forget it's there. EtherPrint comes with a built-in thin EtherNet transceiver. EtherPrint supports LocalTalk Phase 1 and 2, and all LocalTalk compatible printers including Apple LaserWriters and ImageWriters, plus QUME, IBM 4216 Personal Page Printer II, HP DeskWriter and LaserJet printers.

#00003

\$348

#00003	10BaseT	\$348
#03546	LocalTalk	\$348
#00321	EtherPrint Plus	\$599
#00322	EtherPrint T-Plus	\$620

**Daynaport E/Z**

For compact Macs such as the Classic, Portable or Plus, or any Mac without a free card slot, we have the fastest and easiest Ethernet connection around. This external connector box plugs into the printer port and communicates at high-speed with the Macintosh processor. #00804

YOUR CHOICE

\$230

#00805	Daynaport E/SEi
#00806	Daynaport E/LC
#03547	Daynaport E/SE
#03548	Daynaport E/II

STATUS Mac

The Professional's Choice for Macintosh Support

INVENTORIES
ASSET TRACKING
TROUBLESHOOTING
SYSTEM 7 TRANSITION
LICENSE COMPLIANCE

PHAROS TECHNOLOGIES

STATUS*Mac 2.0

STATUS*Mac 2.0 is the most complete, flexible system ever designed for remotely gathering comprehensive information about all hardware and software associated with every Mac on your network. You can easily perform network-wide inventories, asset tracking, troubleshooting and software license compliance

verification. Contains System 7 readiness kit. #04157

4158 Status Mac 2.0 Unlimited (unlimited node license) \$799

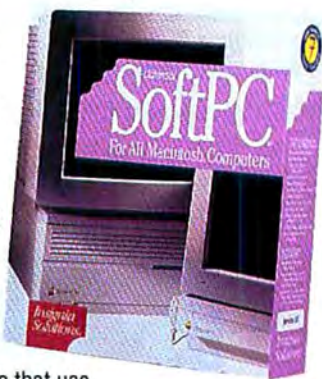
\$299

INSIGNIA SOLUTIONS

Soft PC V2.5

The Soft PC: AT/EGA Module is a power add on that enhances Soft PC's inherent XT compatibility and performance by adding AT capabilities with vibrant EGA color, LIM expanded memory support, and the ability to

run programs that use a math co-processor. #03282
#02506 Soft PC 1.3 \$241

\$123**NOW CONNECT YOUR MACS WITH SHIVA****Net Modem E**

NetModem/E is a stand-alone Ethernet communications device designed to meet three LAN communi-

cations needs. It allows remote workstations to dial in and have full access to network services; lets LAN workstations call out to remote information serviced or hosts; and joins geographically separated networks in a routing connection over ordinary phone lines. NetModem/E supports Macintosh and PC computers on AppleTalk and Novell NetWare networks, NetModem/E switches automatically to accommodate Macs and PCs in each of the three application areas. #04129

\$1749**FastPath V**

Shiva FastPath 5 gateway allows Macintoshes on a LocalTalk network to access Ethernet network systems and services. It also allows Ethernet-based machines to access AppleTalk on a LocalTalk network. Everyone has company-wide access to printing, electronic mail and file servers wherever they're located. #04038

\$1899**SHIVA LINE LISTINGS**

#04129	Shiva Netmodem/E 10 Base T	1749
#04491	Shiva Netmodem/E Thin	1749
#04758	Shiva Netmodem/E Thick	1749
#04759	Shiva Netmodem/E AUI	1749
#03251	Shiva Netmodem V.32 9600	1149
#01615	Shiva Netmodem V2400	338
#02985	Ethergate	1295
#03726	Ethergate International Version	1295
#04038	Shiva Fast Path V Thick/Thin	1899
#01405	Shiva Netbridge	408
#01406	Shiva Netserial	274
#02542	Shiva Telebridge	408

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ASANTE ETHERNET PRODUCTS



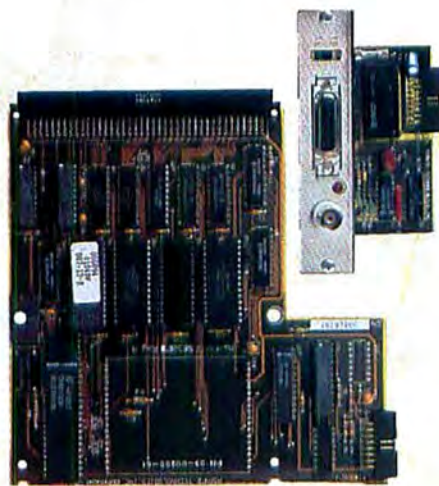
ASANTE

Mac Con +30 IET

Asante Technologies family of Ethernet solutions gives you Macintosh all the right connections. Our MacCon+ network interface cards plug into your Mac to deliver high-performance connectivity that's reliable and cost-effective. MacCon+ ET Series cards support both thick (10 Base 5) and UTP (unshielded twisted pair 10 Base T) media. You get full compatibility with Apple's Ether Talk™ card (at the register level) which allows MacCon+ cards to serve in a wide variety of hardware and software environments. Plus, support for AppleShare®, TOPS, NetWare®, and 3+ Open™ is built in. And all MacCon+ cards comply fully with the IEEE 802.3 Ethernet standard for thick (10 Base 5) and UTP (unshielded twisted pair) (10 Base T) media. #03646

#00020 Mac Con+ 30 IE \$219

\$199



ASANTE

Ethernet Family

Asante Technologies' family of Ethernet solutions gives your Macintosh all the right connections. The MacCon+ network interface cards plug into your Mac to deliver high performance connectivity that's reliable and cost effective.

Thick/Thin Products 10 Base T Products

#03641 MacCon+ II E	\$199	#03885 10 Base T HUB	\$659
#00221 MacCon+ II E64	\$269	#03945 10T MAU	\$99
#00020 MacCon+ 30IE	\$269	#03643 MacCon+ II ET EN	\$249
#03647 MacCon+ 30IE64	\$269	#03642 MacCon+ II ET64	\$254
#03648 MacCon+ SEE	\$199	#03649 MacCon+ SE ET	\$199
#00327 Asante EN/SC	\$339	#03885 10-THUB	\$659



NUVOTECH

NuvoLink SC

Plug the NuvoLink SC into the SCSI port of your Mac, and can connect to an Ethernet LAN. The package includes Apple Manager, an Ethernet compatible drive, installation software along with statistical and

diagnostic software to help manage NuvoLink SC effectively. Front panel indicator shows Power On, configurations, diagnostics and network activity. #03115

#00284 NuvoLink SC-T \$358

\$389

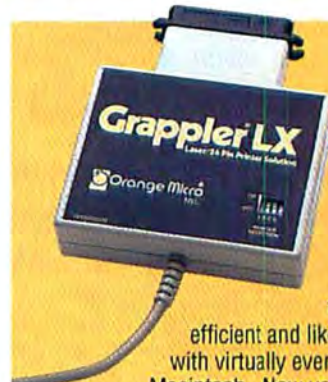
NUVOTECH

NuvoLink II

NuvoLink II is a standard NuBus Ethernet controller card which can be inserted into any Macintosh II series computer. In taking advantage of its NuBus architecture, NuvoLink II offers the Macintosh the greater bandwidth of Ethernet. NuvoLink II adheres to the IEEE standard Ethernet connector specifications. It supports thick and thin Ethernet cable and with a transceiver, standard twisted-pair wire. NuvoLink II is equipped with standard DA 15 connector and a BNC connector to accommodate either cabling scheme. #03119

#04067 NuvoLink II 10 Base T \$189

\$189



ORANGE MICRO

Grappler LX

Open a world of printers for your Mac. The Grappler LX combines high speed performance with years of printer expertise to bring you the best Macintosh interface available. Software improvements make the Grappler more memory

efficient and like other Grapplers, it's compatible with virtually every software package written for

Macintosh. Now you

can print Mac documents

on the HP Ink Jet Printer plus laser printers such as the LaserJet, Okidata, Kyocera and Blaser. Grappler cannot print Printscript files.

#03015

Printer Supplies

#1485 Mac 286 V3.0 Single	\$1078
#3562 O.M. 386 16Mhz	\$1678
#59 O.M. 386 20Mhz	\$1838
#230 Orange Peripherals Kit	\$149
#1517 512K Adapter Kit Grappler	\$26
#3564 Grappler Plus	\$77

Cables

#1435 Grappler 9 Pin (C/Mac/Gs)	\$89
#2080 Grappler Mac LS	\$79
#3015 Grappler Mac LX	\$109
#2430 Grappler Spooler	\$49

\$109

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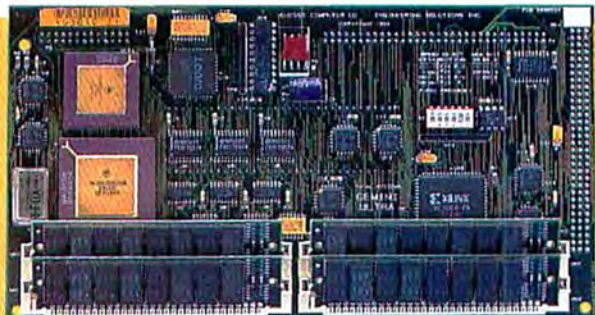
Mercury 030™

TOTAL SYSTEMS devised the low-cost Mercury 030 to deliver reasonable power to people at a rate of their choosing. This well-balanced accelerator card for the Plus and earlier Macintoshes is fast, with 32-bit RAM module for even greater speed, and even faster with the SCSI module added. The modular design keeps costs under your control, letting you add power when you decide you need it. Free VIRTUAL™, free fan and uprated power supply for reliability included. Can accommodate a range of affordable large-screen options. A budget-booster, not a budget-buster!

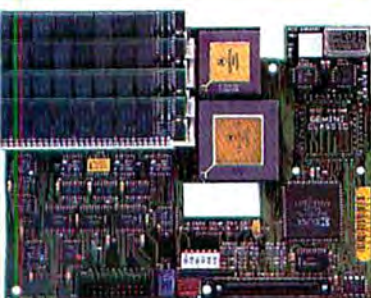
#00034 16MHz with FPU (Plus)	\$649
#00036 16MHz w/o FPU (Plus)	\$498
#00041 16MHz with FPU (SE)	\$449
#00045 16MHz w/o FPU (SE)	\$359

**Gemini Ultra™**

The ultimate accelerator for the SE and earlier Macs from the award-winning Gemini lineage. The formidable, pace-setting Gemini II has been designed from the ground up for more speed, more reliability, easier installation, and 4MB SIMM support for up to 16MB of RAM. Choose from 20MHz, 25MHz, 33MHz, 40MHz 68030 CPU speeds. Burst-mode RAM access adds 15% more speed than equivalent Gemini II configurations. Optional 68882 math coprocessor. 128K, 512K, Plus version includes free high speed SCSI, fan, and power supply; clip-on connector. VIRTUAL is included, free! Now the untouchable leader!

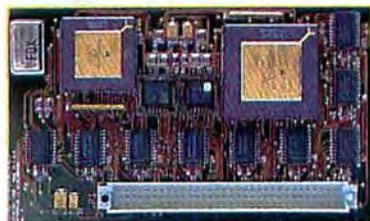


#00541 20Mhz	Call	#00532 33Mhz	\$1379
#00542 20Mhz w/FPU	Call	#00534 33Mhz w/FPU	\$1679
#00543 25Mhz	Call	#00535 40Mhz	\$1479
#00544 25Mhz w/FPU	Call	#00536 40Mhz w/FPU	\$1849

**Gemini Classic™**

A Classic-Booster takes off! Run up to 100 times faster with the first and ultimate 32-bit accelerator for the Macintosh Classic. Built with the attention to detail that created the award-winning Gemini series of accelerator cards. Choose between 20Mhz, 25Mhz, 33Mhz, 40Mhz or 50Mhz 68030 CPU. Upgradable between different processor speeds. Optional 68882 math coprocessor and 4Mb or 16Mb of RAM using standard 1Mb or 4Mb SIMMs. Includes special clip-on connector — no soldering required. Auxiliary power supply keeps your Classic cool.

#00527 20Mhz	\$949	#00531 33Mhz	\$1449
#00528 20Mhz w/FPU	\$1049	#00537 33Mhz w/FPU	\$1749
#00529 25Mhz	\$1179	#00538 40Mhz	\$1549
#00530 25Mhz w/FPU	\$1349	#00539 40Mhz w/FPU	\$1749

**Enterprise 030™**

Continuing the TOTAL SYSTEMS tradition of innovative, powerful and cost-conscious 68030 accelerator cards, now there's Enterprise 030 for the Macintosh LC. Give your sluggish LC the power it needs to drive that dolor display with the speed you want. This full 32-bit accelerator beefs up standard 68020 with a full-strength 16MHz 68030 CPU. Additional MC68882 floating-point coprocessor is optional. Enterprise 030 is easily installed in minutes into the Processor Direct Slot, and compiles with Apple's power and thermal specifications.

\$609

Magellan 040

The PREMIUM 68040 accelerator for the Macintosh SE/30 and IIs! With Magellan you get the jaw-dropping workstation power of a 35Mhz 68040 CPU, with PMMU and FPU built-in. SwitchMatic™ technology switches you between 68030 and 68040 in a few clicks — on the fly, no restarts for 68040-ficky applications. High-end graphics, CAD, statistical analysis application as in other computer-intensive tasks fly past in a blur of speed!



#00293 Board IIFX	\$2195	#00292 Board SE/30	\$1995
#00291 Board IISI	\$1995	#00295 Board 040 IICI	\$2195

RADIUS The Radius Rocket

The Radius Rocket dramatically boosts your Macintosh application performance. Both graphics and calculations are up to 10 times faster. Offering you the first multi-processing NuBus system optimized for high-speed data transfer, Radius Rocket's 68040-based acceleration engine launches your Macintosh beyond the speed performance of a Macintosh IIfx. #04207

\$1799



Cache-In IIfx

Increase performance up to 40%. The 32K cache card is the smallest available, measuring only 1.5" x 4.75", leaving room inside the IIfx for 5.25" hard drives.

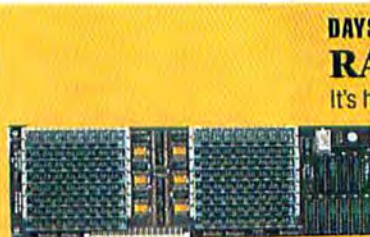
Best of all, Cache-In was developed and built by Applied Engineering, long a leader in Apple enhancement products. #00289

\$194

Cache-In 50

Cache-50 blasts your IIfx's speed beyond the speed of the IIfx! The ultra fast 50MHz 68030 CPU combined with an advanced 64K cache gives your IIfx the power you've been longing for. The board comes complete with a 25MHz 68882 math coprocessor chip for high speed number crunching. One-year warranty. Seat-belt not included. #04072

\$1899



DAYSTAR

RAM PowerCard

It's here...cost effective memory expansion on a NuBus card. Just pop in SIMMs and plug it in. The RAM PowerCard gives you room for up to 16 standard SIMMs per card. Multiple cards can be chained for even larger needs. Use it for superfast virtual memory in System 7...as

a lightning fast RAM disk for multimedia imaging or both. Sort up to five times faster! It's the affordable answer for memory upgrades. #03730

\$499

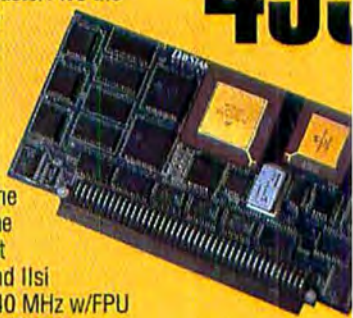
DAYSTAR

Digital PowerCache

The new PowerCache is even faster and is a "universal" performance upgrade. Its innovative design allows for complete transportability from one machine to another. The same card fits in almost any Mac from the LC and IIfx up to the IIfx.

\$1199

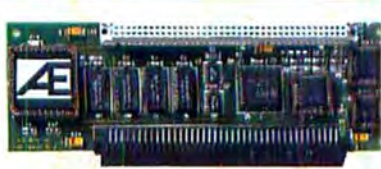
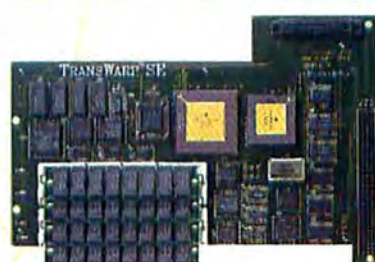
#04320 40 MHz w/FPU
#04322 50 MHz w/FPU \$1999



DAYSTAR LINE LISTINGS

#02214 LT-200 PC Local Talk Board	\$184	#04323 PowerCache 23 MHz for SE/30, LC, II, IIfx, IIfx, IIfx, IIfx	\$799
#02215 LT-200 MC Local Talk Board	\$295	#04057 PowerCache 40 MHz	\$899
#02877 FastCache IIfx	\$278	#04321 PowerCache 50 MHz	\$1499
#04181 FastCache IIfx	\$309	#03729 SCSI Powercard w/o SIMMS	\$1199
#04183 Dual Port IIfx with no FPU	\$104	#03730 Ram Powercard w/o SIMMS	\$499
#04182 Dual Port IIfx with FPU for SE/30 LC, II, IIfx, IIfx	\$169	FPU is a floating point math co-processor	

ACCELERATE WITH APPLIED ENGINEERING



TransWarp SE

Accelerate Your SE to Warp Speed. Up to 10 times faster than standard SE! MC68882 Math Chip MC68030—25MHz or 40MHz Standard SIMM Sockets Expansion Connector (for third-party cards) Surface Mount Technology. Full One-Year Warranty. #04325

\$799

QuickSilver

QuickSilver gives your IIfx a slot extender cache card and math-coprocessor (optional). The extender enables cards created for the SE/30 to fit neatly inside the IIfx case. The 25ns static RAM cache provides quicker screen refresh, faster scrolling and rapid image manipulation. The 68882-20MHz FPU increases the speed of math-intensive applications. Five year warranty. #04154

\$308



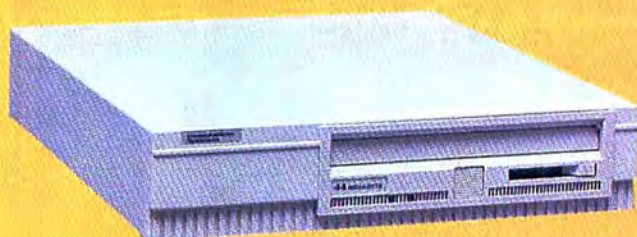
FastMath LC

Make your LC a math whiz with FastMath LC. The card uses a 68882-16MHz FPU to dramatically increase the speed of math intensive applications. FastMath LC plugs easily into the LC's processor direct slot (PDS) with no switches to flip or jumpers to move. Full five year warranty. #04120

\$139

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Established 1984

CORPORATE P.O.'S SHIP SAME DAY



GENERATION SYSTEMS

External Hard Drives

Generation Systems' hard drives combine high performance with low prices. Built using only the finest drive mechanisms, each Generation Systems drive is built with attention to the smallest detail. Features include a heavy duty power supply, external termination, external SCSI address switch, dual convenience outlets, and a rugged steel cabinet that fits perfectly under your Macintosh.

#04561 30Mb

#04589 45Mb

\$319 \$599

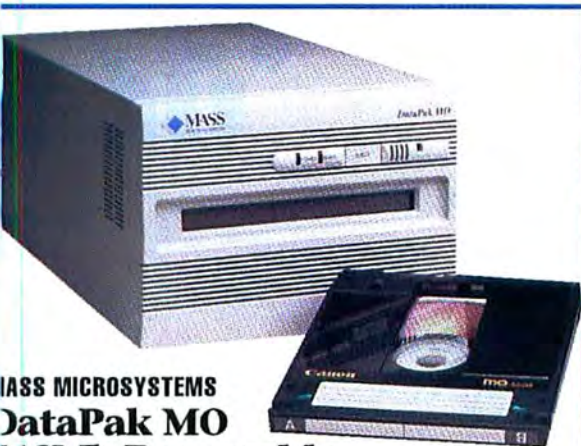


MASS MICROSYSTEMS

DiamondDrive High-Capacity External Hard Drives

High-capacity and high-performance at an affordable price, DiamondDrives are available in capacities from 120MB to 510MB. With access times as low as 12 msec and 150,000 hour MTBF, each DiamondDrive Utility software provides easy-to-use formatting, volume partitioning and test diagnostics. All DiamondDrives are preformatted, and covered with a two-year warranty and a toll-free 800 technical support line. From the first name in storage.

Diamond Drive 120 (DD120)	\$540	Diamond Drive 320 (DD320)	\$1478
Diamond Drive 210 (DD210)	\$898	Diamond Drive 510 (DD510)	\$2087



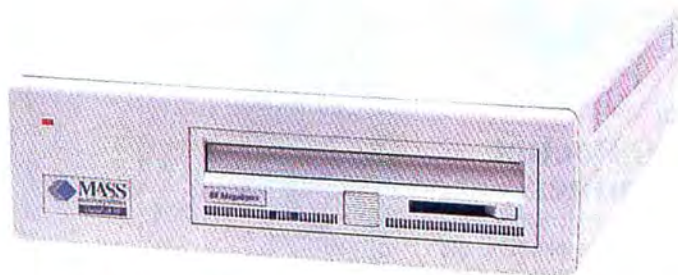
MASS MICROSYSTEMS

DataPak MO 512Mb Removable, Rewritable Optical Drive

The DataPak MO is a high speed read/write/erasable optical drive with 512 megabytes of storage capacity on a removable cartridge, features the fastest disk rotational speed of 3000 rpm and a 64K data cache for fast data access and throughput. A highly reliable system, the DataPak MO features a non-contact laser read/write system that eliminates head crashes and does not deteriorate data over time. Designed to operate on any SCSI-based Macintosh, the DataPak MO is ideal for any application that requires high capacity backup or archiving of files. The drive includes a unique anti-dust filtering system that eliminates head contamination. Each DataPak MO comes bundled with the DiskDoubler data compression utility from Alient. All DataPak MO drives are covered with a one-year warranty and an 800 technical support line. #00177

\$2899

#00164 Optical Cartridge \$208



MASS MICROSYSTEMS

88Mb Removable Cartridge Drives

Voted the best by the industry critics, it's still the first family of removable cartridge drives. With 45 or 88 megabytes on each removable cartridge, they're an inexpensive way to add capacity and backup your valuable data. Actually faster than many fixed hard drives, the DataPak comes with dual SCSI ports, SCSI cable, external terminator, auxiliary AC power outlets, external fuse and surge protection, and built and tested with high quality componentry. PadLok utility software provides password protection and volume partitioning.

#00175 DataPak 45 Meg
(Plus/SE/Classic footprint)

#00176 DataPak IIc
(Mac IIcx/IIci footprint)

#04062 DataPak 88 Meg

**\$649
\$699
\$849**

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ADVANCED HARDWARE FROM CORE

**Optima - 2 Year Warranty**

The Optima Series consists of external SCSI hard disk drives in capacities of 80, 120, and 200 MB. OPTIMA drives are available for the full line of Macintosh computers—with all the features you need. #04165

#04164 250Mb Optima\$1249

#04166 120Mb Optima\$749

\$599**HC - 5 Year Warranty**

The HC Mac Series consists of SCSI hard disk drives in capacities of 330, 650, 1000 and 1300 Mb. HC Series drives are available for the full line of Macintosh computers—with all the features demanding users require. #04208

#04209 HC 650Mb HD Ext\$2899

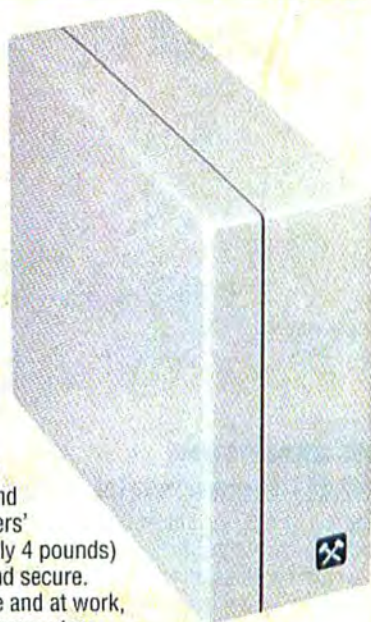
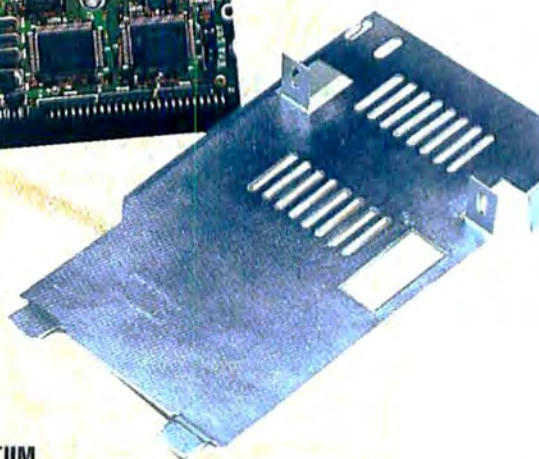
#04210 HC 1000Mb HD Ext\$3995

\$2195

FWB

100 Pocket Hammer

Hammer's high performance and superb engineering and reliability are built into every compact PocketHammer. Shock mounting and intelligent design make them rock-solid and built to last. The PocketHammers' small size and low weight (barely 4 pounds) make them easy to transport and secure. They're the ideal drives at home and at work, for the full range of Macintosh computers. PocketHammer drives cost a little more than average drives because they are in a class by themselves for performance, security, and reliability. Assembled by hand utilizing brushed aircraft aluminum enclosures, PocketHammers function flawlessly in the most demanding environments. For professional users whose data is irreplaceable, the PocketHammer is the only choice. #00506

**\$799**

QUANTUM

52 QLPS

Datacel drives achieve the highest throughput in the industry by using award winning Quantum LPS mechanism and easy to use hard drive formatting software. Our internally mounted disk drive unit will provide quick, reliable mass storage for your Mac II, IIfx, IICx, IICi, or IIfx. #04033

\$329**Quantum Drives**

#00019	Int 105 Mb QLPS IICi/cx	\$499
#00163	Quantum 210 Mb Int H	\$949
#00405	52 Mb QLPS Ext Hd	\$399
#03683	105 Mb QLPS Ext Hd	\$549
#04225	Int 105 Mb QLPS SE/II	\$499
#04693	52 Mb QLPS Int IICi	\$329



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ONE STOP SOURCE FOR ALL YOUR MAC NEEDS

Infinity Turbo 88

The Infinity 88 Turbo removable gives you infinite storage potential with the new 88 Mb removable cartridges and with the TurboV-Cache disk accelerator software and TurboBoost, you can achieve near zero effective average access times. #00182

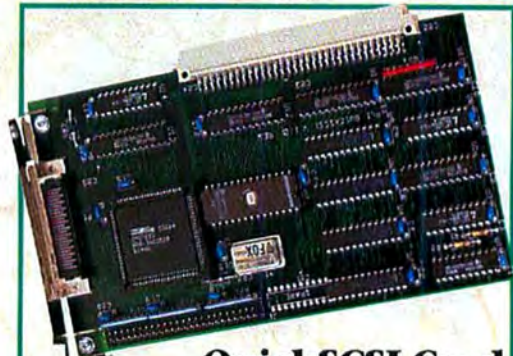
\$839



2 Mb Hard Drive

High Speed Data Storage - PLI's proprietary software includes true 1:1 interleave and provides efficient data transfer speeds 30-300% faster than the competition. Access times are as low as 10.7ms. And using our QuickSCSI NuBus card, you can get burst transfer rates of up to 6MB/sec. No other drive company offers such performance. New Low-Profile Models: PLI also has low profile drives for internal installation in the Macintosh Classic, LC and IIs. Sizes range from 52 to 105MB. PLI drives are all fully System 7.0 compatible. That includes partitioning, virtual memory and personal file sharing. #04450

\$499



QuickSCSI Card

QuickSCSI offers a simple and economical, yet powerful way to eliminate the Macintosh SCSI port bottleneck. It lets your hard drive work at a maximum possible speed by supporting data transfer rates up to 6 Mb/second. The disk cloning option lets you copy the exact contents of one entire drive to another. Run up to 45 SCSI devices simultaneously. #00811

\$399



BUREAU OF ELECTRONIC PUBLISHING Pioneer CD ROM Six Pack

Includes U.S. History on CD ROM (\$395), Countries of the World (\$495), Birds of America (\$99), Shakespeare (\$99), Sherlock Holmes (\$99) and Software Potpourri/Movie Database (\$69). #04345

\$219



PLI CD-ROM

The PLI CD-ROM is the most fully-featured drive available. It has a self-cleaning objective lens, eliminating bothersome dust problems. It offers audio output through a 1/8" headphone jack and two RCA jacks. Volume control for the headphones is provided by a convenient dial on the front panel. PLI software is compatible with virtually every CD-ROM drive on the market, and supports all of the HyperCard audio XCMDs. It also allows channel control on those drives which support it. #03691

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CD TITLES

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NEC CD Gallery

NEC's CD Gallery™ adds worlds of exciting new capabilities to your Macintosh computer. CD Gallery provides your Macintosh with the ability to display pictures and illustrations, listen to live audio and experience motion graphics. CD Gallery provides you with 7 of today's most popular and innovative interactive CD-ROM software programs. NEC's CD-Gallery includes everything you need to be up and running instantly: from hardware to cables to stereo speakers to seven fun, educational and informative interactive CD software titles. *Monitor not included.* #04133

THIS PACKAGE INCLUDES: CD Drive, 2 Stereo Speakers, 4 Batteries, 3 Original Titles - *Grolier's Encyclopedia, Time Table of History, World Atlas* and 4 NEW Titles - *Desert Storm, Cinderella, Cosmic Ozmo, Beethoven's 9th-CD Companion*

CDR-36 CD ROM TypeGallery Bundle

The most affordable and convenient way to purchase Adobe Post-Script language typefaces. Unlock up to 15 FREE individual typefaces, any 3 of the 210 Adobe typeface families, for immediate access. Unlock additional typefaces easily by calling NEC's toll free number. Save 40-50% vs. Adobe's diskette based Suggested Retail Price. #00077

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CDR-73 CD ROM

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MAJOR CREDIT CARDS ACCEPTED

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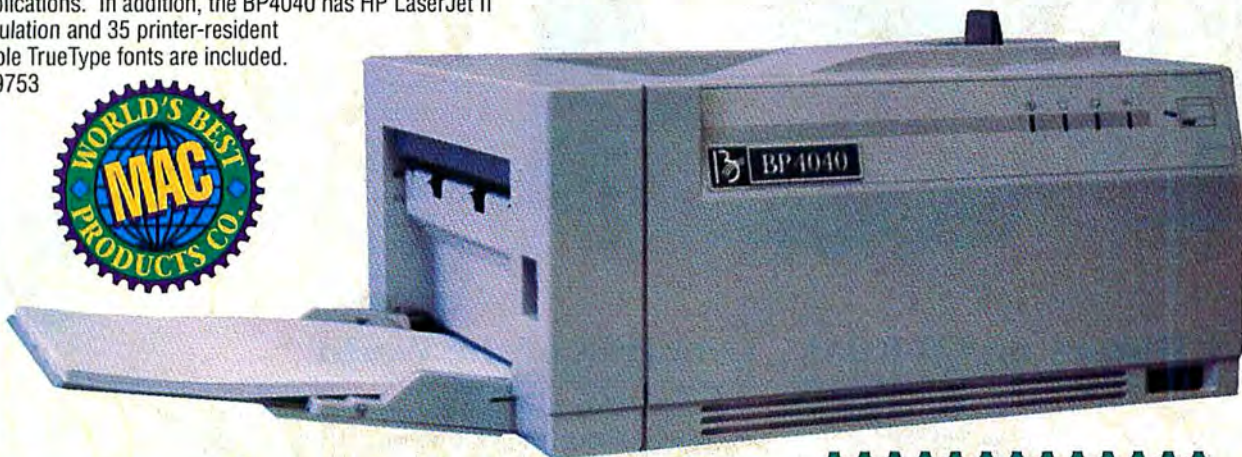
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BEZIER SYSTEMS

BP4040 PostScript Laser Printer

The BP4040 PostScript laser printer features an AMD 29000, 16MHz RISC-based controller that can process full-page images in a fraction of the time required by most other PostScript printers. The BP4040 uses Microsoft's Truetype page description language, providing superior text and graphics processing capabilities, and is compatible with PostScript applications. In addition, the BP4040 has HP LaserJet II emulation and 35 printer-resident Apple TrueType fonts are included. #09753

\$1499



QMS MICROELECTRIC

QMS-PS 410

fully - Adobe® PostScript® at an affordable price. Features include: Emulation Sensing Processor (ESP) Technology - Allows the QMS-PS 410 to recognize data streams and automatically invoke appropriate PostScript language (i.e., PostScript or HP PCL®). Simultaneous Surface Operation (SIO) - Allows the QMS-PS 410 to receive data on all three of its interfaces simultaneously. Maximize your design flexibility by choosing from 45 licensed, resident Adobe PostScript fonts; all scalable from 4 points upward. Our proprietary ASAP™ technology (Advance System Architecture for PostScript) and a 16.67 MHz 68020 microprocessor make this the fastest PostScript printer in its class. #04584

1999

TEXAS INSTRUMENTS

microLaser Plus PS17

's award-winning microLaser printer is now faster than ever, printing a quick 9 pages per minute (ppm). We've enhanced the original award-winning microLaser's 6 ppm speed without increasing the price. How did we do it? We added a prefeed command to the engine controller that pulls the paper along the paper path before you're ready to print. That means when you send print commands to the printer, the paper is already in the paper path, ready to go—saving you valuable print time so you can get back to work faster. #04096

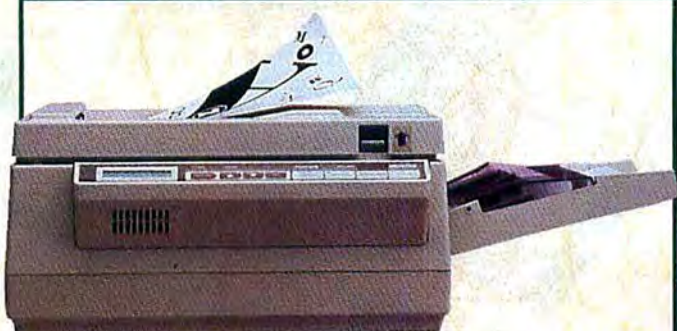
#04313 microLaser Plus PS 35 \$1,699



\$1300



HIGH QUALITY, LOW PRICE



MICROTEK

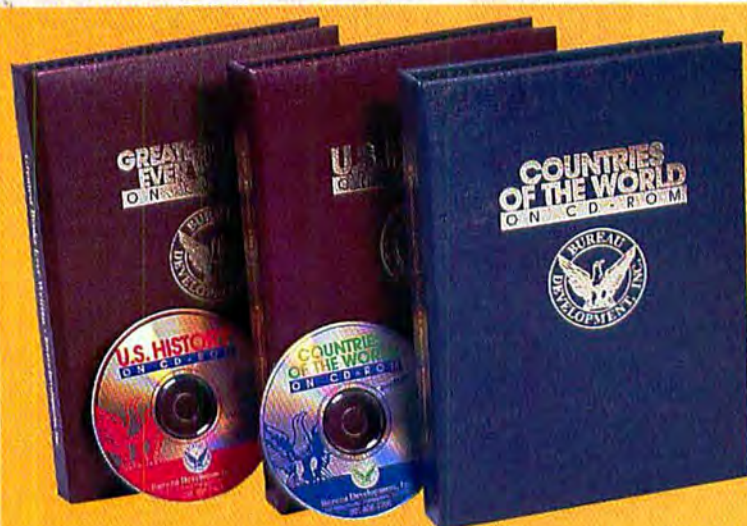
TrueLaser Printer

If you're in search of a laser printer that's fast, flexible and simple to use, you've just found it. TrueLaser is the first laser printer that's fully PostScript, Truetype, and PCL compatible. TrueLaser is also the first printer to come bundled with 35 resident TrueType fonts. Its combination of flexibility, superior speed and sensible price offer an affordable way to make your published work look its best. Six month on-site warranty. #04047



\$1399

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Countries of the World

Go into any major library and ask detailed questions about a particular country or geographic location. The reference librarian will know that an atlas or encyclopedia only includes a few pages of information about the country of interest—and is inadequate for serious research. When you really need detailed information, the best source by far is the U.S. Army's Country Handbook for that particular country. If you're lucky, the library will have the one you need. Now, the entire collection is available on a single CD-ROM, and is supplemented with extraordinary maps, flags, and recorded (not synthesized!) national anthems. #04470

#04468 Greatest Book \$159

\$279

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Monarch Notes

Are you faced with the prospect of a semester's worth of reading in six hours—or just trying to understand the Classics? For years, Simon & Schuster's Monarch Notes series have been a dream come true for students and parents. And with the release of the CD-ROM edition of the Monarch Notes, the full text of the entire collection—over 200 different notes—are available for one low price. No more frantic trips around town searching for the Notes you need, or last minute trips to the library. You can have the entire collection, many of which are no longer in print, for less than 50 cents per Note (single copies can cost \$5!). The Monarch Notes are much more than a shortcut guide to understanding the Classics. They are widely recognized by educators as a definitive source for appreciation of meaning, form, and style of the world's greatest literature. #04467

\$54

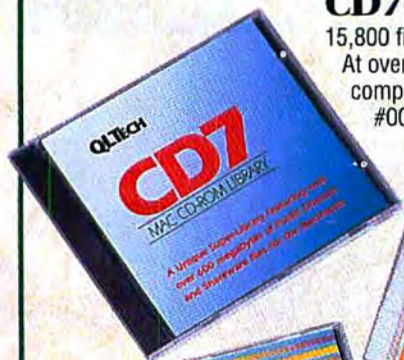
QUANTUM LEAP CD SOFTWARE

CD7-Super Library

15,800 files including art, games, demos and utilities. At over 700 megabytes it's the world's largest non-compressed CD-ROM library.

#00150

\$49



Macademic - Education Library

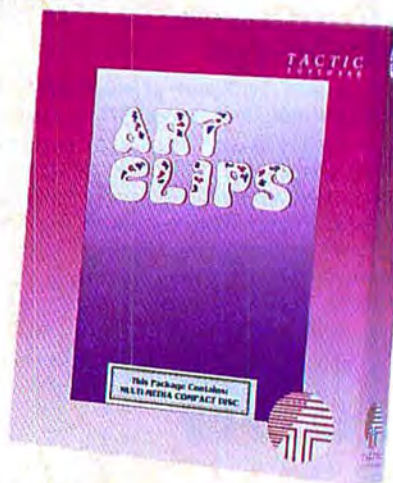
From anatomy to zoology, art, music, math, science, foreign languages, fun and games, as well as

teacher's help and more. Pre-school through advanced graduate levels. #00151

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\$98 Giga-ROM - Archival Library

The largest collection of Mac software ever assembled on single compact disc, over 11,000 shareware archives in compact format. Indexed with On Location for super-fast search and retrieval. #00152



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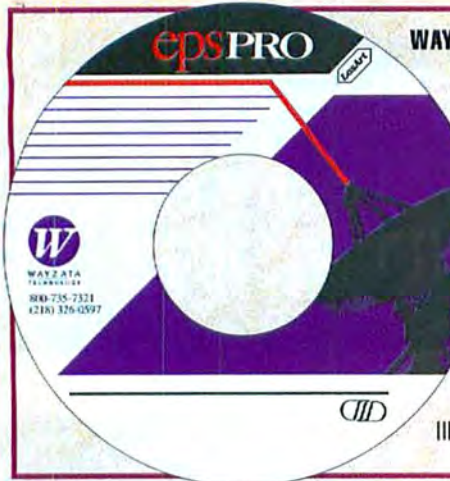
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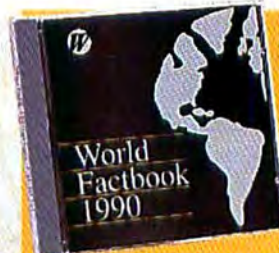
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THIS INDEX COVERS THE 12 ISSUES OF MACWORLD PUBLISHED DURING 1991. IT LISTS MOST PRODUCTS ALPHABETICALLY AND UNDER SUBJECT HEADINGS. BOLDFACE PAGE NUMBERS INDICATE A MAJOR REFERENCE.

3 In Three, May 195,
Dec 152
4th Dimension, Feb 184
FrameMaker link, Dec 18
911 Utilities, Mar 130

A

A4, Nov 186
Abaton LaserScript printer,
May 142
Abaton Scan 300/GS
scanner, Oct 146
About Cows, Dec 192
Accel-a-Writer II printer,
Dec 156
Accountant, Inc., Nov 186
Accounting, Nov 186
MasterPlan, Jun 101
M.Y.O.B., Oct 193
personal finance pro-
grams, Mar 152
Quicken, Dec 181
ACCPAC Simply Account-
ing for the Macintosh,
Nov 186
AccuText OCR, Nov 171
Active Document, May 103
Active Memory, Nov 18
Address books, Apr 178
customizing, Oct 227
InTouch, May 183
MacPhonebook, Sep 239
TouchBase, Sep 233
AddressWriter, Apr 99
Administrator's Aid,
Feb 152
Adobe Illustrator, Feb 196
Insights, Oct 233
Adobe Photoshop, Jan 144,
Apr 144, Jul 23, Sep
135, 248, Nov 291
shrink window to size of
picture, Aug 192
trapping, May 159

Adobe Type Manager,
May 152
Adobe Type Reunion,
May 152
AdSpeed, Sep 129
Advanced Security, Jun 122
Adventures of Willie
Beamish, The, Sep 20
After Dark, Mar 130, May
195, 218
More After Dark, Volume
One, Dec 184
Afternoon, a story, Jan 218
AgentDA, Nov 261
Agfa Focus II GSE scanner,
Oct 146
Agfa Focus Color Scanner,
Jun 130
AgreeMentor, Jan 218
Air Mouse, Feb 18
Alarming Events, Nov 261
Alchemy, Feb 160
Aldus Digital Darkroom,
Sep 226
Aldus FreeHand, Feb 113,
Aug 148, Dec 17
avoiding color banding,
Jan 231
training, Dec 199
Aldus PageMaker, Feb 142,
184, Dec 17
Aldus Additions, Jul 165
Aldus PrePrint, Jan 195
CheckList, Jan 18
DataShaper, Jan 18
editing rotated text,
May 34
on small screen, Nov 289
proofing spot-color text,
Feb 270
resetting ruler's zero
point, Jul 264
scripting language,
Jul 165
Table Editor, Sep 19
text-alignment tip,
Jan 235
threading elements,
Aug 191
training, Dec 199
Aldus PrePrint, Jan 195
Aldus SuperCard, Nov 194
Alge-Blastor Plus, Apr 177
Algebra Homework Tutor,
Apr 177
Alliance APS-45R remov-
able-cartridge drive,
May 124
Alliance Drive hard drive,
Mar 136
Amazing Paint, Jan 184

A.M.E., Feb 152, May 172,
Jun 122, Sep 20
American Heritage
Electronic Dictionary,
The, Oct 156
Andean World, The,
Apr 124
Andrew Tobias' Managing
Your Money, Mar 152
Animation
Animation Works,
Sep 208
ElectricImage, Dec 181
FilmMaker, Mar 160
Life Forms, Oct 97
Sculpt 4D, Nov 151
Animation Works, Sep 208
Aperture Network &
Resource Manager,
Feb 152
AppDisk, Oct 197
Apple 12" Monochrome
monitor, May 132
AppleCD SC drive dust
problems, Nov 17
AppleColor High-Resolu-
tion RGB Monitor,
Oct 114
Apple Computer
Apple Europe, May 87
Apple Pacific, Dec 91
Apple-IBM alliance, Sep
19, Oct 25, 55, Nov
149, Dec 17
commentary, Feb 23,
May 69, Sep 168, 176,
Dec 119
Customer Assistance
Center, Jan 17, Apr 191
Apple Hard Disk SC, Mar
136, Sep 184
Apple Macintosh 12" RGB
Display, Oct 114
Apple MIDI Interface,
Jun 146
Apple OneScanner,
Dec 109
Apple Portrait Display,
May 132
Apple Scanner, Oct 146
AppleShare, Dec 119
AppleShare Print Server,
Feb 152
AppleTalk Internet Router,
Apr 130
AppleTalk Remote Access,
Dec 113
Apple Two-Page Mono-
chrome monitor,
May 132
APS 330 Runner hard

drive, Jul 184
APS hard drive, Sep 184
APS Teac 155 and 600 tape
drives, Nov 176
ArcView, Sep 139
Artificial life, May 43
Asante EN/SC, Apr 130
Ask It, Jan 215
Assistant Controller
Accounting Series,
Nov 186
Astrix, Feb 239
Asuka NuScan Color and
NuScan Gray handheld
scanners, Jun 154
ATF Type Designer I, May
18, Aug 122
Athena hard drive, Sep 184
Atlas GIS, Jan 107
ATM, May 152
atOnce, Nov 186
At Risk, Sep 20
@Risk, Sep 20
At Your Service, Nov 246
Audiomedia board,
Feb 160
Authorware Professional,
Nov 194
AutoCAD for the Macin-
tosh, Aug 34
AutoMac, Jul 39
AutoMac III, Apr 138
Avid/1 Media Composer,
Feb 178
AVR 3000/CL Plus
scanner, Jun 130
AVR 3000/GS Plus
scanner, Oct 146
Aware Corporate General
Ledger, Nov 186

B

Backup programs, Mar 130
DiskFit, Jul 228
DiskFit Pro, Nov 18,
Dec 17
MacBack 8000, Mar 171
Network DiskFit, Jul 228
Baker's Dozen, Jan 77
Ballet Tutor, Apr 124
BannerMania, May 185
Baobab Individual Learning
Courses, Aug 171,
Dec 199
Bayshore Blast, Apr 124
BBSS. See Online services
BeagleWorks, Oct 19,
Nov 163
Beaker, Nov 257
Bernoulli 90 removable-

cartridge drive, Oct 93
Bernoulli series removable-
cartridge drives, May
124, Jun 18
Bernoulli Transportable 90
removable-cartridge
drive, Feb 234, Dec 190
Bible references, Dec 186
Billiards, Jan 77
Bioshield, Jan 17
Bird Anatomy II, Apr 124
Birds of America, Sep 256
BLP Elite printer, Nov 226
Boards
accelerators, Jul 176, 210
Apple II emulation board
for Macintosh LC, Jul 18
Audiomedia, Feb 160
cache, Jul 176
color display, Jan 152
ColorServer display,
Jan 18
ColorSnap 32+ video
capture, Oct 164
Compression Master,
Jan 115
digital audio, Feb 160
display, Feb 119
DisplayServer Classic, LC,
and IIsi display, Jan 18
DoubleUp compression,
Apr 95
DVA-4000/Macintosh
video, Sep 206
E-Machines XL8 and
Futura/24 graphics/
accelerator, Oct 97
Ethernet, Apr 130
Ethernet LC Card and
Ethernet NB Card,
Mar 105
Ether TrnT and TWT series
Ethernet, Jul 18
FPU upgrades, Jul 176
graphics accelerators,
Jan 136
graphics boards problems
in Macintosh IIsi,
Mar 103
Hydra One, May 107
Kodak color space
translation/accelerator,
Sep 19
MacCon+ 30i Ethernet,
Jan 109
MacCon+30i/Radi-
us Ethernet/color, Sep 19
Macintosh IIsi Cache
Card, Jun 17
MaraThon 030 Classic
upgrade, Jan 17,

Feb 119
MegaGraphics multifunc-
tion display adapter,
Feb 127
Mobius One Page 030
Display, Feb 17
PageBlaster PostScript
rasterizer, Apr 99
PowerCache accelerator,
Dec 117
PrecisionColor 8X and
24X NuBus graphics
adapters, Nov 153,
Dec 115
QuickImage 24 video
capture, Oct 164
QuickView Studio video,
May 107
Radius 68040 accelerator,
Apr 17
Radius Pivot IIsi Interface
and Two Page Display
IIsi Interface, Feb 119
Radius Rocket accelera-
tor, Dec 167
RasterOps 24si color/
accelerator, May 111
RasterOps 245TV video,
May 111
RasterOps display,
Feb 119
Sigma Bullet 3040
compression, Apr 95
Sound Accelerator,
Feb 160
Spectrum/8 LC and
Spectrum/8 si display,
Jun 17, Jul 155
Thunder/8 and Thunder/
24 graphics/accelerator,
Oct 19
TokaMac LC 68040
accelerator, Apr 17,
Dec 167
TokaMac SX and CI
accelerators, Dec 167
upgrades, Apr 197,
Jul 176
video capture, Feb 23,
178
Book of MIDI, The,
Apr 124
Books, Jul 141
Introduction to Digital
Color Prepress, An,
Jan 231
Technical Introduction to
the Macintosh Family,
Jul 264
Boomerang, Jan 77
continues

- BrainMaker, Oct 95
 Brother HL-BPS printer, Dec 156
 Bubble Help for HyperCard, Apr 124
 Business Color System monitor, Oct 114
 Business LaserPrinter IIS, Feb 200
 Business Sense, Nov 186
- C**
- Cabletron Systems E series Ethernet connectors, Apr 130
 CA-Cricket Draw, Jan 42
 CAD
 AutoCAD for the Macintosh, Aug 34
 Canvas, Apr 101
 MacDraw Pro, Feb 119, Nov 228
 MiniCad+, Jul 231
 ModelShop, Feb 18
 CAD/CAM, Dec 29
 Calculator, Jan 237
 Calendar, Nov 261
 CalenDar, Nov 261
 Calendar Creator, Nov 261
 CalendarMaker, Nov 261
 Calendar programs, Nov 261
 CAM, Dec 29
 Camouflage, Jun 122
 Canfield, Jan 77
 Canon IX-30F scanner, Oct 146
 Canvas, Feb 18, Apr 101
 Carbon Copy Mac, Jun 105
 Cataloger, Feb 240
 ccMail, Jun 17
 CD Companion Series: Igor Stravinsky: The Rite of Spring, Aug 162
 CD ROM
 About Cows, Dec 192
 American Heritage Electronic Dictionary, The, Oct 156
 AppleCD SC drive dust problems, Nov 17
 CD Companion Series: Igor Stravinsky: The Rite of Spring, Aug 162
 Chinon America CDA-431 CD ROM Drive, Oct 184
 encyclopedias, May 168
 Intersect CDR-36 and CDR-73 CD ROM drives, Jun 17
 MacSPIRS, Jun 177
 multimedia, Sep 255
 NEC CDR-72 CD ROM drive problems, Nov 17
 PLI CD-ROM drive, Oct 184
 Spaceship Warlock, Sep 129, Oct 180, Dec 152
 Terrorist Group Profiles, Dec 152
 Toshiba America TXM-3300A CD ROM drive, Jul 17
 yearbook, Apr 101
 Champion for the Mac, Nov 186
 Charts. See Graphs
 CheckFree, Mar 152
 CheckList, Jan 18
 CheckWriter II, Mar 152
 Cheshire, Mar 177
 Chicago font symbols, Nov 278
 Chinon America CDA-431 CD ROM Drive, Oct 184
 Chinon America DS-3000 Color Scanner, Nov 242
 Circuit design, Electronic Workbench, Nov 259
 Cirrus hard drive, Mar 136, Sep 184
 Citadel, Sep 20
 ClarisWorks, Nov 163
 Cleaning Macintosh Interior, Jun 209
 ClearView/LC Monochrome Display System, Feb 119
 ClearVue/II, SE, XL monitors, May 132
 ClearVue/GS monitor, May 132
 ClickChange, Feb 222, Jun 219
 Clip art
 Quality Artware, Feb 240
 Southwest Collection, Aug 172
 Clipboard, Jan 237
 bypassing, Feb 117
 Clones, Macintosh, Apr 116, Aug 32, 33
 Heat Seeker II, Nov 167
 Club Mac Hard Disk, Mar 136
 Club Mac Q series hard drives, Sep 184
 Club Mac SyQuest 45 removable-cartridge drive, May 124
 CMS Enhancements TS60 and TS150 tape drives, Nov 176
 Cobra hard drive, Mar 136, Sep 184
 Cobra series high-capacity hard drives, Jul 184
 CodeCheck, Nov 240
 Colby ClassMate portable, Sep 141
 Color, Jan 83
 24-bit monitors, Jan 152
 avoiding banding, Jan 231
 color matching, Feb 103
 CorrectColor Calibrator, Jul 153
 graphics accelerators, Jan 136
 Kodak color space translation/accelerator, Sep 19
 paint programs, Apr 144
 PhotoYCC standard, Feb 129
 prepress, Jan 231, Jul 23, Oct 138
 printers, Feb 168
 proofing spot-color text, Feb 270
 ColorBoard 208, 264, and 364 video boards, Feb 178
 ColorCapture video capture board, Feb 178
 ColorDex, Aug 171
 Color MacCheese, Apr 144
 Colomate PS Model 40 printer, May 17
 Colomate PS printer, Feb 168
 ColorMax 8/24 Display Adapter board, Jan 152
 ColorMax 8/24 Display System, Oct 114
 ColorPage E16 monitor, Oct 97
 ColorPage T16 monitor, Oct 114
 ColorPoint PS printer, Feb 168
 ColorPoint PSX printer, Nov 18
 ColorQuick Ink-Jet Printer, Feb 168
 ColorScript 100 Model 10, 20, and 30 printers, Feb 168
 Color separation, Jan 231, Jul 23, Oct 138
 ColorServer display board, Jan 18
 ColorSnap 32 video capture board, Feb 178
 ColorSnap 32+ video capture board, Feb 178, Oct 164
 ColorSpace FX, III, and Plus/SE video boards, Feb 178
 ColorSqueeze, Jul 18
 ColorStudio, Jan 144, Apr 144, Sep 135
 Commander EIS, Jan 113
 Communications. See also E-mail; Fax modems; Modems; Networks; Online services
 AppleTalk Remote Access, Dec 113
 Carbon Copy Mac, Jun 105
 DoubleTalk, Apr 18
 GlobalGate, Dec 17
 Inform, Nov 151
 Instant Update, Nov 151
 Macintosh-IBM mainframe, Nov 253
 MicroPhone II, Feb 17
 SimMac, Nov 253
 Timbuktu, Jun 23, 105
 Timbuktu/Remote Access Pack, Feb 204
 WPduet, Feb 224
 Zterm, Jan 77
 Compactor, Jan 77
 Compact Pro, Oct 197
 Complete Half-Page Scanner, The, Jun 154
 Components, Nov 186
 Comport fax modem, Aug 114
 Compression, Jan 17, 128, Jul 23
 ColorSqueeze, Jul 18
 Compactor, Jan 77
 Compact Pro, Oct 197
 Compression Master board, Jan 115
 Crush, Dec 18
 DoubleUp board, Apr 95
 Impressit, Jun 23
 MPEX, Jun 18
 Stuffit, Jan 235
 Stuffit Deluxe, Jul 222
 SuperDisk, Apr 18
 Compression Master board, Jan 115
 Computer-aided design. See CAD
 ComputerEyes and ComputerEyes Professional, Feb 178
 Computerized Classic Accounting, Nov 186
 Comstation Four fax modem, Dec 18
 ComTalk, Apr 130
 Concorde 635 and 1050 hard drives, Jul 184
 Connected Accounting, Nov 186
 Conquest of the Long Bow—The Legend of Robin Hood, Sep 20
 Consumer law, May 63
 ControlTower, Nov 159
 Conversion DA, Jan 77
 Convertit, May 192
 Copyrighted material, use of, Feb 23, May 31
 CorrectColor Calibrator, Jul 153
 Correct Grammar for the Macintosh, Aug 138
 Cosmic Osmo, Apr 124
 Course Builder, Nov 194
 Cramel 1G hard drive, Jul 184
 Critters, Jan 77
 Crop marks, Oct 212
 Crush, Dec 18
 Crystal Ball, Jul 226
 CrystalPrint Express and CrystalPrint Publisher II printers, Dec 156
 CrystalPrint Publisher printer, Jan 42
 Customer support, Sep 95
 Cutting Edge 20 Trinitron 8-Bit Color Monitor, Oct 114
 Cutting Edge 45MB Removable Cartridge Drive, May 124
 Cutting Edge 330MB F/H and 660MB F/H Wren Runner hard drives, Jul 184
 Cutting Edge hard drive, Sep 184
 Cypress FaxPro fax modem, Aug 114
- D**
- Dancing Mouse, The, Apr 124
 Darwin's Dilemma, Jan 203
 Databases
 ACIUS database server, Apr 17
 customizing, Oct 227
 FileMaker, Apr 191, Jun 204, Sep 272
 FileMaker Pro, Feb 184, 226, Mar 219, Aug 171, Oct 212, 227
 FoxPro/Mac, Apr 103
 HOPS, Apr 97
 mapping programs, Jun 175
 MyAdvancedDatabase, Sep 242
 Panorama II, Aug 85
 publishing, Feb 184
 Selectics, Dec 117
 Serious Business, Jan 103
 Databases, 4th Dimension, Feb 184
 Data Description, Oct 95
 Data Desk, Oct 95
 Data Discman, May 23, Aug 32
 DataFrame XP hard drive, Mar 136
 DataLink LC fax modem, Aug 114
 DataLink/Mac fax modem, May 174
 DataPak 88 series removable-cartridge drives, Jun 101
 DataPakMO erasable optical drive, Jun 138
 DataPak series removable-cartridge drives, May 124
 Dataproducts LZR 1260i printer, Dec 156
 Data-recovery services, Jun 18, Dec 73
 DataShaper, Jan 18, Feb 184
 DataStar removable-cartridge drive, May 124
 Data Translation DT2879-60Hz video board, Feb 178
 DaynaPort E series Ethernet connectors, Apr 130
 Deck, Feb 160, Apr 156
 DeltaGraph Professional, Sep 19
 Deltaic Server 320H hard drive, Jul 184
 Deltaic Server hard drive, Sep 184
 DeluxeRecorder, Jun 146
 Descartes, Jun 175
 Desert Storm: The War in the Persian Gulf, Sep 255
 Designer/8 20" Color Display System, Oct 114
 DesignScript, Feb 184
 DesignStudio, Feb 184, Jun 18, Nov 212
 reading small text, Jul 266
 Desk, Jan 209
 Desk accessories, Jan 237
 installing under System 7, Nov 278
 DeskPaint & DeskDraw, Apr 144
 Desktop, Jan 231, Apr 192, May 211
 Desktop file, rebuilding on floppies, Jul 264
 Desktop publishing. See also Aldus PageMaker; Fonts; Prepress; QuarkXPress
 4th Dimension-FrameMaker link, Dec 18
 Aldus PrePrint, Jan 195
 communications links, Jun 23
 creating crop marks, Oct 212
 DesignStudio, Feb 184, Jun 18, Jul 266, Nov 212
 database publishing, Feb 184
 FrameMaker, Jan 180, May 17, Dec 18
 Interleaf, May 103
 Introduction to Digital Color Prepress, An, Jan 231
 Page Director, May 170
 Personal Press, Aug 159
 Publish-It Easy, Oct 20
 RagTime, Jun 18
 trapping, May 159, Aug 31, Sep 55
 Ventura Publisher, Jun 170
 WysiWord, Nov 163
 Dialog boxes, clicking radio buttons in, Mar 200
 Dialoger Professional, Apr 124
 Dictionary of the Living World, Sep 255
 Diery, Ian, interview, Dec 91
 DigiMatic, Jul 149
 Digitizers. See Scanners
 DigiVideo and DigiVideo Color video boards, Feb 178
 DirectColor/24 display board, Jan 152
 DirectColor/GX accelerator board, Jan 136
 DirectDrive hard drive, Mar 136, Sep 184
 DirectDrive Portable hard drive, Sep 184
 Disabled, products for, Jun 91
 Disinfectant, Jan 77, Mar 130, Apr 192
 Disk Accessory Plus, Apr 178
 Disk drives, floppy. See also Erasable optical drives; Hard drives; Removable-cartridge drives
 SuperDrive, Sep 269
 TrackMate cleaning system, Feb 240
 DiskExpress, Mar 130
 DiskExpress II, Jul 18
 Disk First Aid, Feb 263
 DiskFit, Mar 130, Jul 228
 DiskFit Pro, Nov 18, Dec 17
 DiskLock, Jun 122
 DiskKover 45R removable-cartridge drive, May 124
 DiskKover 250T and 525T tape drives, Nov 176
 DiskKover 325 hard drive, Jul 184
 DiskKover hard drive, Mar 136
 Disks. See Floppy disks; Hard drives
 DiskTop, Mar 130
 Display Net, Apr 124
 Displays. See Monitors
 DisplayServer Classic, LC, and IISI display boards, Jan 18
 DisplayServer-TV video board, Feb 178
 DJK Development MS-410 hard drive, Jul 184
 DJK Development MS hard drive, Sep 184
 DJK Development TEO-One erasable optical

continues

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Concurrent	Gould/Encore	McDonnell	Pertec	and more
Convergent	HP	Douglas	Plexus	
	IBM AS/400		Prime	

drive, Jun 138
 Dollars & Sense, Mar 152
 DOS Mounter, Sep 269
 DoubleTalk, Apr 18
 DoubleUp compression board, Apr 95
 DoveFax Desktop fax modem, Aug 114
 DoveFax+ fax modem, Aug 114, Sep 223
 DPI 44 Removable drive, May 124
 DQ-Animaq Broadcast and DQ-Animaq Desktop, Feb 178
 DrawingCard 2-Page Display System, Oct 114
 DreamNet, Dec 111
 DriveSavers, Jun 18
 DVA-4000/Macintosh video board, Sep 206
 Dvorak keyboard, Jan 37
 DynoPage, Sep 230

E

Earl Weaver Baseball, Oct 186
 Earthquake prediction system, May 109
 Earthquake Preparedness Stack, Apr 124
 Earthquest, Apr 158
 Eastman Kodak XL 7700 printer, Feb 168
 Easy Access, Jul 263
 Easy Alarms, Nov 261
 Easy Color Paint, Apr 144
 Easy Envelopes+, Jan 77
 EasyKana, May 195, Sep 58
 Ecodisc, Sep 255
 Editorial Advisor, May 188
 Edit Worx, Feb 178
 Education
 About Cows, Dec 192
 Alge-Blaster Plus, Apr 177
 Algebra Homework Tutor, Apr 177
 Ask It, Jan 215
 Ballet Tutor, Apr 124
 Birds of America, Sep 256
 CD Companion Series: Igor Stravinsky: The Rite of Spring, Aug 162
 Dictionary of the Living World, Sep 255
 Earthquest, Apr 158
 EasyKana, May 195, Sep 58
 Electronic Workbench, Nov 259
 Geometer's Sketchpad, The, Nov 234
 Global Jukebox, Sep 141
 Learn to Speak Spanish, Sep 255
 Mac School, Jul 242
 Mathematics Teacher's Workstation, Jan 215
 MiBAC Music Lessons, Nov 250
 NumberMaze Decimals & Fractions, Oct 173
 Oregon Trail, The, Oct 176
 Point of View, Jan 214
 reader survey, Jul 165
 ReadingMaze, Nov 233
 SimEarth, Jun 162,

Sep 269
 SmartCards, May 196
 StatView Student, Nov 244
 String Quartet, The: The Essence of Music, Mar 164
 U.S. History on CD-ROM, Sep 255
 Wagon Train, Oct 176
 Where in Time Is Carmen Sandiego?, Jan 200
 Your Personal Trainer for the SAT, Apr 177
 Effects Specialist, Aug 122
 EGA/AT Option Module IBM PC emulator, Nov 224
 Ehman 20 Trinitron 8-Bit Color Monitor, Oct 114
 Ehman 45MB Removable Cartridge Drive, May 124
 Ehman 330MB and 660MB F/H Wren Runner hard drives, Jul 184
 Ehman series hard drives, Sep 184
 Ehman Two-Page Monochrome monitor, May 132
 Ektaplus 7016PS printer, Apr 18
 ElectricImage, Dec 181
 Electronic Frontier Foundation, Jun 38
 Electronic mail. See E-mail
 Electronic Workbench, Nov 259
 ELF emissions, Jan 17, Feb 83, Mar 29, Apr 87, Sep 127, Oct 65, 124
 E.L.F. Armor, Dec 44
 ELITE Professional Flight Simulator, Apr 166
 El Verbo Simple, Apr 124
 E-Machines/24 display board, Jan 152
 E-Machines T19 and TX monitors, Oct 114
 E-Machines XL8 and Futura/24 graphics/accelerator boards, Oct 97
 EMac Impact 150T tape drive, Nov 176
 E-mail
 ccMail, Jun 17
 MicroPhone interface to PB connection, Oct 93
 Microsoft Mail, Apr 93, Aug 150
 Network Courier, Jun 17
 privacy issues, Mar 63
 QuickMail, May 18, Sep 269
 WordPerfect Office, Dec 170
 EMF emissions, Jan 38
 Empower I and II, Jun 122
 Enchanted Journey, Jul 250
 Encryption, Jun 122. See also Security
 FlashCrypt, Apr 18
 Enhance, Jan 18, Nov 231, 291
 Entertainment. See Games
 Envelopes, AddressWriter, Apr 99
 Envision, Feb 18
 Epson America EPL-7500

printer, May 105, Dec 156
 Epson America ES-300C scanner, May 164, Jun 130
 Erasable MO Vista erasable optical drive, Jun 138
 Erasable optical drives, Jun 138
 Ergonomics, Aug 67, Sep 135
 E-Server/LAN, Apr 130
 Etch A Sketch, PostScript, Jan 113
 Ether+, Ether2, and EtherDS Ethernet connectors, Apr 130
 EtherGate, Apr 130
 EtherLink/NB and EtherLink/SE Ethernet connectors, Apr 130
 Ethernet, Apr 130. See also Networks
 Ethernet LC Card and Ethernet NB Card, Mar 105, Apr 130
 EtherNode series Ethernet connectors, Apr 130
 EtherPeek, Feb 152
 EtherPort series Ethernet connectors, Apr 130
 EtherPrint, Apr 202
 EtherRoute, Apr 130
 EtherVHP Ethernet connector, Apr 130
 Europa hard drive, Sep 184
 Excel. See Microsoft Excel
 Expanse NB4 and NB II, Jan 17
 Expert Backgammon, Jun 189
 Expresso slide scanner, Nov 153
 Extend, Sep 135
 Eyeballs, Jan 77
 EZ Vision, Jun 146

F

Fair Witness, Nov 159
 Fastback Tape drive, Nov 176
 FastNet series Ethernet connectors, Apr 130
 FastPath, Apr 130
 FastPath 5 Ethernet gateway, Sep 137
 FastTrack Resource, May 18
 Fax modems, Aug 114, Nov 37, Dec 228
 Constellation Four, Dec 18
 DataLink/Mac, May 174
 DoveFax+, Sep 223
 Teleport/Lap, Dec 115
 File compression. See Compression
 File conversion
 ConvertIt, May 192
 MacLinkPlus/PC and MacLinkPlus/Translators, Nov 18
 FileGuard, Jun 122
 FileList, Jan 77
 FileMaker
 compressing files, Sep 272
 exporting tagged text files, Jun 204
 importing Microsoft

Works data, Apr 191
 FileMaker Pro, Feb 184, 226
 button for New Record command, Oct 212
 customizing, Oct 227
 Insights, Mar 219
 tutorial, Aug 171
 File recovery, Apr 193, Aug 189
 Last Resort, Sep 235
 FileSecure 500 and 1000 tape drives, Nov 176
 File transfer
 Mac-to-Mac, Oct 191
 Rich Text format, Dec 17
 Software Bridge Macintosh, Apr 173
 FilmMaker, Mar 160, Nov 194
 Finances, Real Estate Investment Analysis, Jul 249
 Financial Decisions, Mar 152
 Financial programs, Mar 152. See also Accounting
 Finder, Jan 237
 increasing memory size, Dec 226
 Fiscal Knowledge, Nov 186
 FlashCrypt, Apr 18
 FlashWrite, Dec 152
 FlexFax 9624M fax modem, Aug 114
 FlexiTrace, Oct 195
 Flexware II, Nov 186
 Floppy disks
 cataloging, Feb 240, Apr 178, Aug 171
 converting MFS to HFS, Feb 266
 defective, May 211
 difference between 800K and 1.4MB, Oct 211
 labels, Apr 178
 mailing, Jun 203
 rebuilding desktop file, Jul 264
 replacing defective, Apr 193
 Floppy Fixer, Jan 77
 Fluent Laser Fonts Library, Jan 113
 FolderBolt, Jun 122
 FolderJump, May 196
 FONDler, Jan 77
 Font/DA Mover, May 152, Nov 278
 Fontina, May 152
 FontMonger, Oct 162
 Fontographer, Aug 122
 Fonts
 Apple support for Type 1 PostScript, Nov 17
 ATF Type Designer I, May 18, Aug 122
 avoiding conflicts, Feb 266
 Bitstream Type 1, Feb 18
 Chicago symbols, Nov 278
 creating, Aug 122
 digital type primer, Jul 202
 Effects Specialist, Aug 122
 embossed text, Nov 276
 Fluent Laser Fonts Library, Jan 113

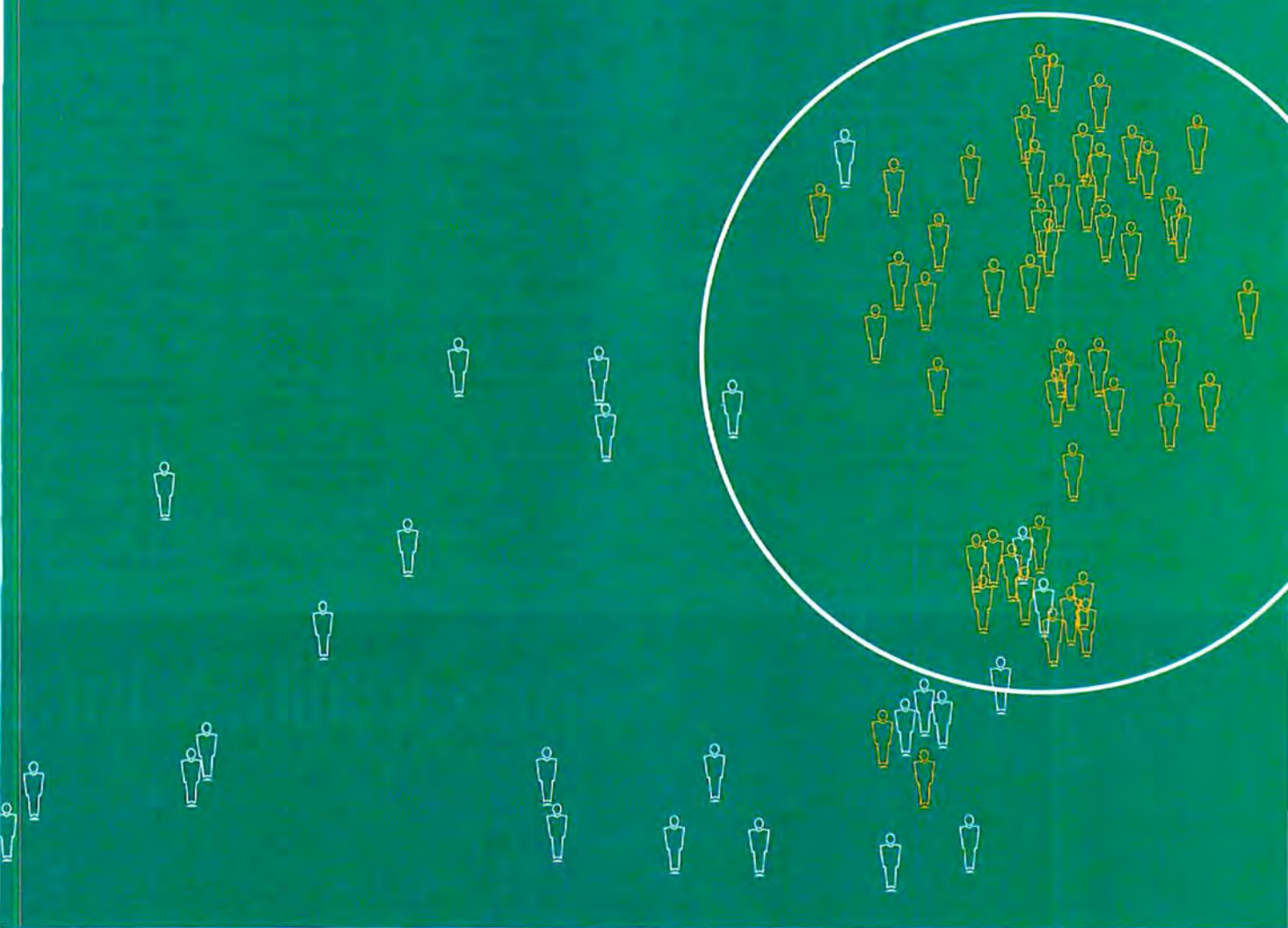
FONDler, Jan 77
 FontMonger, Oct 162
 Fontographer, Aug 122
 FontStudio, Jul 17, Aug 122
 Ikarus-M, Aug 122
 Initial Caps, Aug 172
 installing and organizing, May 152
 LetraStudio, Jul 17, Aug 122
 Multiple Master typefaces, May 18, Jun 99
 patterned text without PostScript, Sep 273
 PostScript versus TrueType, Sep 194
 RandomFonts, Jan 103
 Smart Art, Aug 122
 special effects programs, Aug 122
 TypeChart, Apr 124, Jul 249
 TypeStyler, Aug 122
 typography tips, Oct 131
 VideoQuill, Jun 186
 FontStudio, Jul 17, Aug 122
 Forms design
 If: X, Jan 18
 One Shot, Jul 249
 FoxPro/Mac, Apr 103
 Fractal Attraction, May 196
 FrameGrabber 324NC board, Feb 178
 FrameMaker, Jan 180, May 17
 4th Dimension link, Dec 18
 FriendlyNet LC Card Ethernet connector, Apr 130
 Frontier, Aug 51, Nov 159
 Ft. Knox, Jun 122
 Fujitsu RX7100PS printer, May 142
 FullWrite Professional, Sep 160

G

GAIA, Aug 93
 Games, Jan 77
 3 In Three, May 195, Dec 152
 Adventures of Willie Beamish, The, Sep 20
 Baker's Dozen, Jan 77
 Billiards, Jan 77
 Canfield, Jan 77
 Conquest of the Long Bow—the Legend of Robin Hood, Sep 20
 Darwin's Dilemma, Jan 203
 Earl Weaver Baseball, Oct 186
 ELITE Professional Flight Simulator, Apr 166
 Enchanted Journey, Jul 250
 Expert Backgammon, Jun 189
 Glider+, Jan 77
 Golf, Jan 77
 Go Junior, Feb 218
 GunShy, May 211
 King's Quest V, Sep 20
 Klondike, Jan 77
 Leisure Suit Larry, Sep 20
 Loom, Sep 245
 MacTrek, Jan 77

Montana, Jan 77
 NumberMaze Decimals & Fractions, Oct 173
 Oregon Trail, The, Oct 176
 Pararena, Jan 77
 Playmaker Football, Feb 220
 Police Quest, Sep 20
 PuzzleMaker, Aug 171
 ReadingMaze, Nov 233
 RoboSport, Sep 217
 SimAnt, Dec 17
 SimEarth, Jun 162, Sep 269
 Solarian II, Jan 77
 Space Quest IV, Sep 20
 Spaceship Warlock, Sep 129, Oct 180, Dec 152
 Stained Glass, Jan 77
 Tesserae, Nov 248
 Trick or Treat, Jul 250
 Wagon Train, Oct 176
 Where in Time Is Carmen Sandiego?, Jan 200
 Garage, The, May 109
 Gates, Bill, Sep 67
 GatorBox, Apr 130
 GatorCard E/II Ethernet connector, Apr 130
 GCC BLP IIs printer, May 142
 GCC PLP II printer, May 18, 142
 GCC UltraDrive430S hard drive, Jul 184
 Gemini and Gemini II accelerator boards, Jul 210
 Generation Systems 15 One-Page Display, May 132
 Generation Systems Ether TnT and Twp series Ethernet connectors, Apr 130
 Generation Systems Grayscale Display, May 132
 Generation Systems Monochrome Display, May 132
 Generation X Technologies Color 24gx board, Jan 152
 Genius Dual Page Monitor, May 132
 Genius Full Page Monitor, May 132
 Geometer's Sketchpad, The, Nov 234
 GeoQuery, Sep 20
 GeoVista, May 18
 Glider+, Jan 77
 GlobalGate, Dec 17
 Global Jukebox, Sep 141
 Gofer, Mar 130
 Go Junior, Feb 218
 Golf, Jan 77
 GraceLAN, Jul 244
 Grammar checkers, Aug 138
 Grammatik Mac, Aug 138
 Graphics. See also Adobe Photoshop; CAD
 3-D, Jan 18, Aug 197
 accelerators, Jan 136
 Adobe Illustrator, Feb 196
 Aldus FreeHand, Aug 148, Dec 17
 continues

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Amazing Paint, Jan 184
CA-Cricket Draw, Jan 42
Canvas, Feb 18, Apr 101
color paint programs,
Apr 144
ColorStudio, Jan 144, Apr
144, Sep 135
data visualization,
Mar 172
ElectricImage, Dec 181
Envision, Feb 18
Infiniti-D, Sep 222
Initial Caps, Aug 172
IRIS Graphics Library,
Dec 17
Jag, Dec 177
Kid Pix, Jan 77, Aug 152,
Dec 152
MacRenderMan, Jan 176
Michael's Draw, Dec 179
ModaVision, Feb 18
ModelShop, Feb 18
Oasis, Jul 221
Painter, Sep 131
PixelPaint Professional,
May 235, Sep 209
Ray Dreams Designer,
Mar 97, Sep 244
Sketch, Oct 91
StrataVision 3d, Jun 18
Studio/8, Jun 182
Studio/32, Apr 144, 154
Upfront, Mar 109
Graphs
Cheshire, Mar 177
DeltaGraph Professional,
Sep 19
FlexiTrace, Oct 195
KaleidaGraph, Sep 253

MacGraphX, Apr 175
TopDown, Oct 186
Gray-Vision Two-Page
Display, May 132
Great Plains Accounting,
Nov 186
GreatWorks, Oct 99,
Nov 163
Guide, Nov 194
GunShy, May 211

H

HammerDisk44 remov-
able-cartridge disk
drive, May 124
HammerDisk600S erasable
optical drive, Jun 138
HammerFMF hard drive,
Mar 136
Hammer series high-
capacity hard drives,
Jul 184
HammerTape250 tape
drive, Nov 176
HandOff, Mar 130
Handwriting recognition,
Jun 18
Paper Keyboard, Jul 234
Hard Disk Deadbolt,
Jun 122
Hard drives, Mar 136, Jul
184, Sep 184. See also
Removable-cartridge
drives
as start-up drive, Mar
195, Jun 203
data-recovery services,
Dec 73

displaying space available,
Feb 264
HP high-capacity, Dec 18
Jasmine, Apr 75, May 31,
34, Nov 18, Dec 17
large-capacity, Jul 184
Liberty 80, Apr 171
MacinStor Series 1300,
Oct 97
MicroNet, Feb 119
Microtech, Feb 119
partitioning, Aug 189
PocketDrive, Dec 111
Storage Dimensions
internal, Feb 119
SyQuest suit, Feb 113
Tsunami 80-Q, Apr 171
HardPac hard drive, Mar
136, Sep 184
Hard Plus 1.0 Gig - Wren
hard drive, Jul 184
Hard Plus 330 and 660 -
Runner hard drives,
Jul 184
Hard Plus hard drive,
Mar 136
Hayes Personal Modem
2400plus, Dec 152
HD Porta-Drive hard drive,
Sep 184
HDI PowerDrive 600I hard
drive, Jul 184
Health risks, computer-
related, Aug 67, Sep
135. See also ELF
emissions
Heat Seeker II Macintosh
clone, Nov 167
HIQ, Feb 115

HOPS, Apr 97
HP DeskJet printer, Jul 18
HP DeskWriter C printer,
Oct 91
HP high-capacity hard
drives, Dec 18
HP LaserJet IIP printer, Feb
42, May 142
HP LaserJet III printer,
Dec 156
HP LaserJet IIIP printer,
Jul 157
HP LaserJet IIISI printer,
Jul 157, Dec 156
HP PaintJet Color Graphics
Printer, Feb 168
HP PaintWriter printer,
Jun 111
HP PaintWriter XL printer,
Feb 168
HP ScanJet IIc scanner,
Nov 157
HP ScanJet Plus scanner,
Oct 146
Hublet port repeater,
Oct 20
Human Immune System,
The, Jan 105
Hydra One board, May 107
Hyper-Abledata, Apr 124
HyperBible, Dec 186
HyperCard, Jan 101, Apr
124, Sep 297
2.0 Development Kit,
Apr 191
2.0 Upgrade, Apr 191
adding rulers, Dec 226
Andean World, The,
Apr 124

Ballet Tutor, Apr 124
Bayshore Blast, Apr 124
beep when button
pressed, Nov 275
Bird Anatomy II, Apr 124
Book of MIDI, The,
Apr 124
Bubble Help for Hyper-
Card, Apr 124
Convert It, May 192
Cosmic Osmo, Apr 124
Dancing Mouse, The,
Apr 124
Dialoger Professional,
Apr 124
diary stack, Feb 264
Display Net, Apr 124
Earthquake Preparedness
Stack, Apr 124
Earthquest, Apr 158
EasyKana, May 195,
Sep 58
El Verbo Simple, Apr 124
figuring angle of gradient
fill, Jun 204
GunShy, May 211
Hyper-Abledata, Apr 124
HyperBible, Dec 186
HyperCard VideoDisc
Toolkit, Feb 178
HyperMailbox, Apr 124
HyperRegister, Apr 124
HyperSnoop, Jan 218
Insights, Sep 297
interFace, Apr 124
Kids Can Save the Earth,
Apr 124
Lazy Eye, The: A Primer
of Neuro-ophthalmology,

Apr 124
LessonCard, Apr 124
Ludwig van Beethoven
Symphony No. 9,
Apr 124
Mac Frog, Apr 124
Mackerel Stack, The,
Apr 124
Macroscopic, Apr 124
Manage Your Closet,
Jul 250
Metromorphosis, Apr 124
Microsoft Excel Tutorial,
Apr 124
multimedia design,
Nov 194
MusiCard Maker,
Apr 178
Outdoor and Vacation
Adventure Guide,
Apr 124
Peacock, Jun 190
Revolución, Apr 124
ScriptEdit, Jun 190
selecting user level, Apr
191, Aug 189
showing hidden buttons,
May 211
Simulation of Acute
Myocardial Infarction,
A, Apr 124
SmartCards, May 196
SuperImage, Apr 124
SuperStacks contest,
Apr 124
Terremoto, Apr 124
TypeChart, Apr 124,
Jul 249
Video Publisher, May 113

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Women Artists of Color
videodisc, Apr 124,
May 113
HyperCard VideoDisc
Toolkit, Feb 178
HyperMailbox, Apr 124
HyperRegister, Apr 124
HyperSnoop, Jan 218
HyperTax Tutor, Mar 152

I
IAC, Aug 51, Nov 159
IBM PC
converting HyperCard
stacks to ToolBook
format, May 192
EGA/AT Option Module
PC emulator, Nov 224
Hydra One board,
May 107
IBM-Apple technology
agreement, Sep 19, Oct
25, 55, Nov 149,
Dec 17
QuickMail, May 18
SoftPC for the Classic/LC
PC emulator, Nov 224
Software Bridge Macin-
tosh, Apr 173
transferring files to
Macintoshes, Sep 269
versus Macintosh,
Mar 120
Icons
changed after Desktop
rebuild, May 211
copying entire name of,
Apr 195

wiped out in Finder view,
Apr 191
IDS 45 Removable drive,
May 124
IDS Systems Pro hard drive,
Sep 184
IDS Systems V.S.P. hard
drive, Mar 136
IDS Systems Wip hard
drive, Sep 184
IfX, Jan 18
Ikarus-M, Aug 122
Ikegami Grayscale Package
monitor, May 132
Image Grabber, Jul 246
Image processing, Nov
291, Dec 233
Adobe Photoshop, Sep
135, 248, Nov 291
Aldus Digital Darkroom,
Sep 226
ColorStudio, Jan 144, Apr
144, Sep 135
Enhance, Nov 231, 291
Picture Desk, Aug 81
ImageWriter II printer,
Sep 270
transformer for operating
abroad, Jul 263
Imapro QCS-120 scanner,
Jun 130
Impressit, Jun 23
Imprimis series hard drives,
Jul 184
Index hard drive, Mar 136,
Sep 184
Index Portrait Monitor,
May 132
Infiniti-D, Sep 222

Infinity40 Turbo and Turbo
Economy removable-
cartridge drives,
May 124
Infinity 88 Turbo remov-
able-cartridge drive,
Jun 101
Infinity Optical erasable
optical drive, Jun 138
In Focus 5000M Direct
View monitor, Mar 101
In Focus 5000M thin-panel
color display, Feb 17
Inform, Nov 151
In-House Accountant,
Nov 186
Initial Caps, Aug 172
INIT Manager, Mar 130
INITPicker, Mar 130
Input devices, Aug 67. See
also Keyboard; Mouse
Air Mouse, Feb 18
for disabled, Jun 91
MacTrac II trackball,
Sep 139
MousePenMac, Nov 255
MVP Footswitch, Feb 129
MVP Mouse, Feb 129,
Nov 255
pressure-sensitive tablets,
Apr 144
replacing trackball with
billiard ball, Jun 204
Silhouette Trackball,
Dec 152
Stingray Ergonomic
Trackball, Sep 143
Wacom SP series styluses,
Jun 164

Insight Expert Accounting
Series, Nov 186
Inspiration, Dec 195
Inspire erasable optical
drive, Jun 138
Instant Library of Quota-
tions, Jun 189
Instant Update, Jul 163,
Nov 151
Integrated applications
BeagleWorks, Oct 19,
Nov 163
ClarisWorks, Nov 163
GreatWorks, Oct 99,
Nov 163
Microsoft Works, Apr
191, Sep 160, Nov 163
Intensifier ci accelerator
board, Jul 210
Interactive Media Tech-
nologies IMTX 8000,
Feb 178
Interapplication communi-
cations. See IAC
interface, Apr 124
Interface Agent, Jan 107
InterFax 24/96 fax modem,
Aug 114
Interleaf, May 103
Internet Manager, Feb 152
InterPoll, Feb 152
Intersect CDR-36 and
CDR-73 CD ROM
drives, Jun 17
Intertec, Dec 18
InTouch, May 183
Introduction to Digital
Color Prepress, Jan 231
Investor, The, Mar 152

IRIS Graphics Library,
Dec 17
Irwin Model 5080 tape
drive, Nov 176
J
Jag, Dec 177
Jasmine, Apr 75, May 31,
34, Nov 18, Dec 17
Jasmine Removable 45
drive, May 124
JClock, removing, Oct 212
JMP, Oct 95

K
KaleidaGraph, Sep 253
KaleidoScan, Jun 130
Kensington Printer Muffler,
Dec 152
Keyboard
alternatives, Aug 67
Dvorak, Jan 37
keystroke command
shortcuts, Jan 237
long cable for, May 218
MacPro Plus, Sep 228
Switchboard, Feb 198
vacuum, Dec 152
Keyboard Shelf, Feb 240
Kid Pix, Jan 77, Aug 152,
Dec 152
Kids Can Save the Earth,
Apr 124
King's Quest V, Sep 20
KiwiFinder Extender,
Feb 239
Klondike, Jan 77

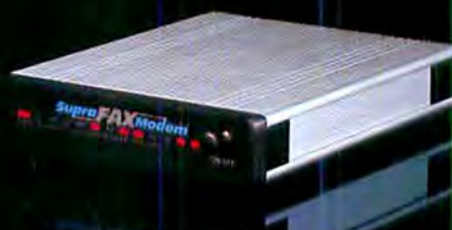
Knowledge Retrieval
System, Apr 95
Kodak color space transla-
tion/accelerator, Sep 19
Kodak Diconix Color 4
printer, Apr 97
Kodak Ektaplug 7016 PS
printer, Dec 156

L
LabanWriter, Feb 125
Labels, Sep 285
ColorDex, Aug 171
Personal Label Printer,
Aug 87
LabView 2, Oct 175
La Cie 600 Magneto
Optical drive, Jun 138
La Cie ZFP 45R removable-
cartridge drive,
May 124
La Cie ZFP hard drive, Mar
136, Jul 184, Sep 184
La Cie ZFP+ series hard
drives, Jul 184
LANalyzer Network
Analyzer, Feb 152
LanWay E series Ethernet
connectors, Apr 130
Lapis FullPage Display,
Dec 115
LapLink Mac, Sep 269
Laptops. See Portables
Larry Rosen Programs,
Mar 152
LaserFrame erasable
optical drive, Jun 138
continues

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- Mail-order companies, Nov 71
- Mainstay, Sep 107
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- Manapro Accounting Software, Nov 186
- Mandala, Feb 127
- Manufacturing, computers in, Dec 29
- MapInfo, Jun 175, Sep 20
- MapMaker, Jan 105
- Mapping
- ArcView, Sep 139
- Atlas GIS, Jan 107
- color version of Map control panel, Nov 289
- Descartes, Jun 175
- GAIA, Aug 93
- GeoQuery, Sep 20
- GeoVista, May 18
- MacGlobe, Nov 18
- Mac USA, Apr 18
- MapInfo, Jun 175, Sep 20
- MapMaker, Jan 105
- MaraThon 020 and 030 accelerator boards, Jul 210
- MaraThon 030 Classic upgrade board, Jan 17, Feb 119
- Mariah, Jun 99
- Market Manager Plus, Mar 152
- Marstek M800 Mac 64 hand-held scanner, Jun 154
- Marstek M800 scanner, Jan 17
- Masquerade, Oct 182
- MasterColor, Apr 144
- MasterFinder, Apr 18, Jun 189
- MasterJuggler, Feb 266, Apr 191, Mar 130, May 152
- increasing limit on files open, Jul 263
- MasterKey, Aug 172
- MasterPlan, Jun 101
- MasterStrokes, Apr 138
- Math
- Alge-Blaster Plus, Apr 177
- Algebra Homework Tutor, Apr 177
- Geometer's Sketchpad, The, Nov 234
- HiQ, Feb 115
- KaleidaGraph, Sep 253
- Mathematika, Feb 125
- Mathematics Teacher's Workstation, Jan 215
- NumberMaze Decimals & Fractions, Oct 173
- Mathematika, Feb 125
- Mathematics Teacher's Workstation, Jan 215
- Mavis Beacon Teaches Typing, Jan 37
- Max, Jan 18, Nov 194
- MaxAppleZoom, Jan 77, Feb 263, Oct 197
- MaxWay 500, Apr 130
- McSink, Jan 77
- M.D.A. and M.D.A. Basics, Nov 186
- MediaMaker, Aug 154, Nov 194
- MediaNode, May 113
- Mediator video-conversion box, Sep 206
- MediaTracks, Jan 198, Nov 194
- Medicine
- Human Immune System, The, Jan 105
- Lazy Eye, The: A Primer of Neuro-ophthalmology, Apr 124
- Lingraphica, Mar 99
- QCT-Bone Mineral Density Analysis, Mar 103
- Simulation of Acute Myocardial Infarction, A, Apr 124
- Meeting Maker, Feb 17, Nov 239
- MegaGraphics 2008/16" Color Display System, Oct 114
- MegaGraphics 2008/19" Display System, Oct 114
- MegaGraphics 2024 TrueColor board, Jan 152
- MegaGraphics 4001 Rival monitor, Feb 119
- MegaGraphics Grayscale monitor, May 132
- MegaGraphics multifunction display adapter board, Feb 127
- MegaGraphics Rival monitor, May 132
- MegaScreen 19" monitor, May 132
- MegaScreen monitor, May 132
- Memory upgrades, Apr 197. See also Boards
- Metro series hard drives, Mar 136, Jul 184, Sep 184
- Metromorphosis, Apr 124
- MIBAC Music Lessons, Nov 250
- Michael's Draw, Dec 179
- MicroLaser PS35 printer, May 142
- MicroMac SE, Jan 18
- Micron Xceed IIci accelerator board, Jul 210
- MicroNet Technology
- CMO-1 erasable optical drive, Jun 138
- MicroNet Technology CPKT-155, CPKT-600, and MT-155 tape drives, Nov 176
- MicroNet Technology MR-45 removable-cartridge disk drive, May 124
- MicroNet Technology MR-90 removable-cartridge drive, Jun 101
- MicroNet Technology MT-150 and MT-320 tape drives, Nov 176
- MicroNet Technology SB-303NP hard drive, Jul 184
- MicroNet Technology SB series hard drives, Jul 184
- MicroNet Technology SB-SMO-1 erasable optical drive, Jun 138
- MicroPhone II, Feb 17
- MicroPlanner Manager, Oct 20
- Microsoft Corporation, commentary, Sep 67
- Microsoft Excel, Mar 101, Sep 204
- @Risk, Sep 20
- entering hundredths of a second, Oct 211
- Info window for multiple cells, Apr 192
- Microsoft Excel Tutorial, Apr 124
- tips, Aug 191
- What-If Solver Premium Edition, Sep 20
- Microsoft Excel Tutorial, Apr 124
- Microsoft Mail, Apr 93, Aug 150
- Microsoft Project, Sep 129, Nov 210
- Microsoft Schedule+, Nov 239
- Microsoft Word, Sep 160
- aligning columns, Oct 211
- creating Table menu, Oct 212
- formula commands, Mar 195
- getting rid of Temp files, Oct 197
- scroll to last cursor location, Apr 193
- shading lines in tables, May 216
- speedy horizontal scrolling, Mar 200
- Microsoft Works, Nov 163
- transferring data to FileMaker, Apr 191
- word processing module, Sep 160
- Microtech N1000 hard drive, Jul 184
- Microtech OR650 erasable optical drive, Jun 138
- Microtech R50 removable-cartridge drive, Feb 234, May 124
- Microtech T150 tape drive, Nov 176
- Microtek MSF-300ZS scanner, Jun 130
- MicroTV video board, Feb 178
- MIDI. See Music
- MidiFace EX and MidiFace LC, Jun 146
- MIDI Interface, Jun 146
- MIDI Translator, Jun 146
- MiniCad+, Jul 231
- Minimum Requirements, Nov 186
- MiniPak 150T tape drive, Nov 176
- MiniPak hard drive, Mar 136
- Minitab, Sep 20
- Mirror ProView Trinitron monitor, Feb 125
- Mirror Technologies M Series hard drives, Mar 136, Sep 184
- Mirror Technologies M325 and M595 hard drives, Jul 184
- Mirror Technologies RM42 continues

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removable-cartridge drive, May 124
 Mirror Technologies RM600 erasable optical drive, Jun 138
 Mitsubishi CHC-445 printer, Feb 168
 Mitsubishi G370-10 printer, Feb 168
 Mitsubishi S340 printer, Feb 168
 Mitsubishi SC-7500 scanner, Jun 130, Jul 233
 Mobius 030 Accelerator board, Jul 210
 Mobius 030 Display System, Feb 17, May 132, Dec 117
 MockPackage Plus Utilities, Jul 264
 ModaVision, Feb 18
 Mode32, Nov 18, 275
 ModelShop, Feb 18
 Modems. See also Fax modems
 Constellation Four, Dec 18
 Hayes Personal Modem 2400plus, Dec 152
 Seta 2500 and 3500,

Jan 115
 V-Series Ultra Smartmodem 14400, Oct 20
 Money management. See Financial programs
 Money Manager, Mar 152
 Monitors, Feb 119, May 132, Oct 114
 24-bit color, Jan 152
 5000M thin-panel color display, Feb 17
 ClearView/LC Monochrome Display System, Feb 119

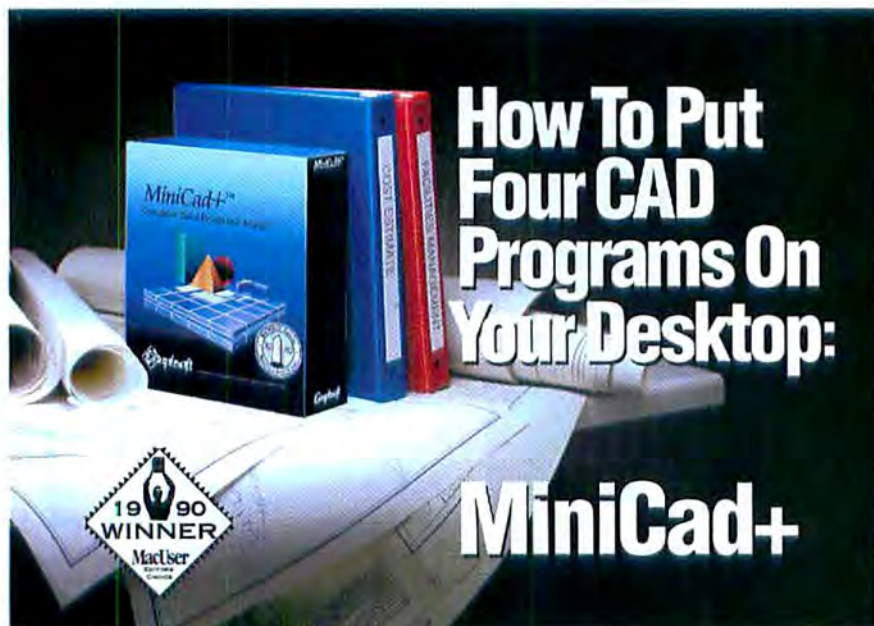
color, Oct 114
 ColorPage E16, Oct 97
 disabling with ResEdit, Feb 267
 expanding display area, Feb 263
 In Focus 5000M Direct View, Mar 101
 Lapis Full Page Display, Dec 115
 line on screen, Nov 275
 L-View Multi-Mode, Oct 166
 Macintosh 21" Color Display, Sep 127

Macintosh LC support for VGA monitors, Apr 18
 MaxAppleZoom, Jan 77, Feb 263, Oct 197
 MegaGraphics 4001 Rival, Feb 119
 Mirror ProView Trinitron, Feb 125
 Mobius 030 Display System, Feb 17, May 132, Dec 117
 monochrome, May 132
 MultiSync FG series, Dec 119
 Nanao Flexscan 9060S, Aug 161
 NEC MultiSync 3DS, Apr 18
 PageView GS, Feb 119
 Pixel-Flipper, Oct 197
 Private Eye miniature display, Apr 95
 QuickView Z21, Oct 166
 Radius Color Pivot, May 17, Jun 103, Oct 114
 Radius FPD, Jul 159
 Radius Pivot IIs and Two Page Display IIs, Feb 119
 VDT ordinance, Apr 87

Ludwig van Beethoven Symphony No. 9, Apr 124
 MacProteus, Jan 188
 MIBAC Music Lessons, Nov 250
 MusiCard Maker, Apr 178
 Music Publisher, Dec 197
 SampleCell, Jun 169
 String Quartet, The: The Essence of Music, Mar 164
 MusiCard Maker, Apr 178
 Music Publisher, Dec 197
 MVP Footswitch, Feb 129
 MVP Mouse, Feb 129, Nov 255
 MyAdvancedDatabase, Sep 242
 MyTimeManager, Oct 20, Nov 261
 M.Y.O.B., Oct 193, Nov 186



Nalevanko, Tom, interview, Sep 107
 Nanao Flexscan 9060S monitor, Aug 161
 NEC CDR-72 CD ROM drive problems, Nov 17
 NEC MultiSync 3DS monitor, Apr 18
 NEC PC-VCR, Jan 101, Feb 178, Oct 154
 NEC SilentWriter2 990 printer, Jul 161
 NEC Silentwriter2 Model 90 printer, May 142
 Neotech Image Grabber board, Feb 178
 NetAtlas, Feb 152
 NetControl, Feb 152
 NetMap, Feb 152
 NetMinder Ethernet, Feb 152
 NetOctopus, Nov 17
 Net One MaxTalk, Apr 130
 NetUpdater, Feb 152
 Net Watchman, Dec 188
 Network Courier, Jun 17
 Network DiskFit, Jul 228
 Networks, Feb 152, Nov 202
 Carbon Copy Mac, Jun 105
 DreamNet, Dec 111
 Ethernet, Apr 130
 Ethernet LC Card and Ethernet NB Card, Mar 105
 EtherPrint, Jan 202
 FastPath 5 Ethernet gateway, Sep 137
 fax modem, Dec 115
 GraceLAN, Jul 244
 Hublet port repeater, Oct 20
 IBM PC-Macintosh file transfer, Sep 269
 Instant Update, Jul 163
 LocalPeek, May 18
 LocalSwitch multiport bridge, Jul 163, Sep 219
 MacBack 8000, Mar 171
 MacCon+30i Ethernet board, Jan 109
 MacCon+30i/Radius



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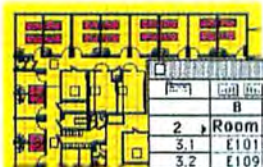
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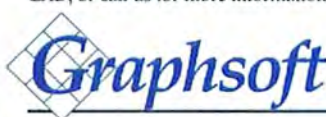
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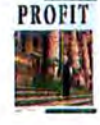
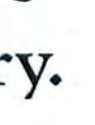
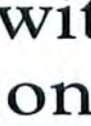
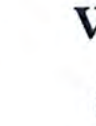
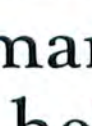
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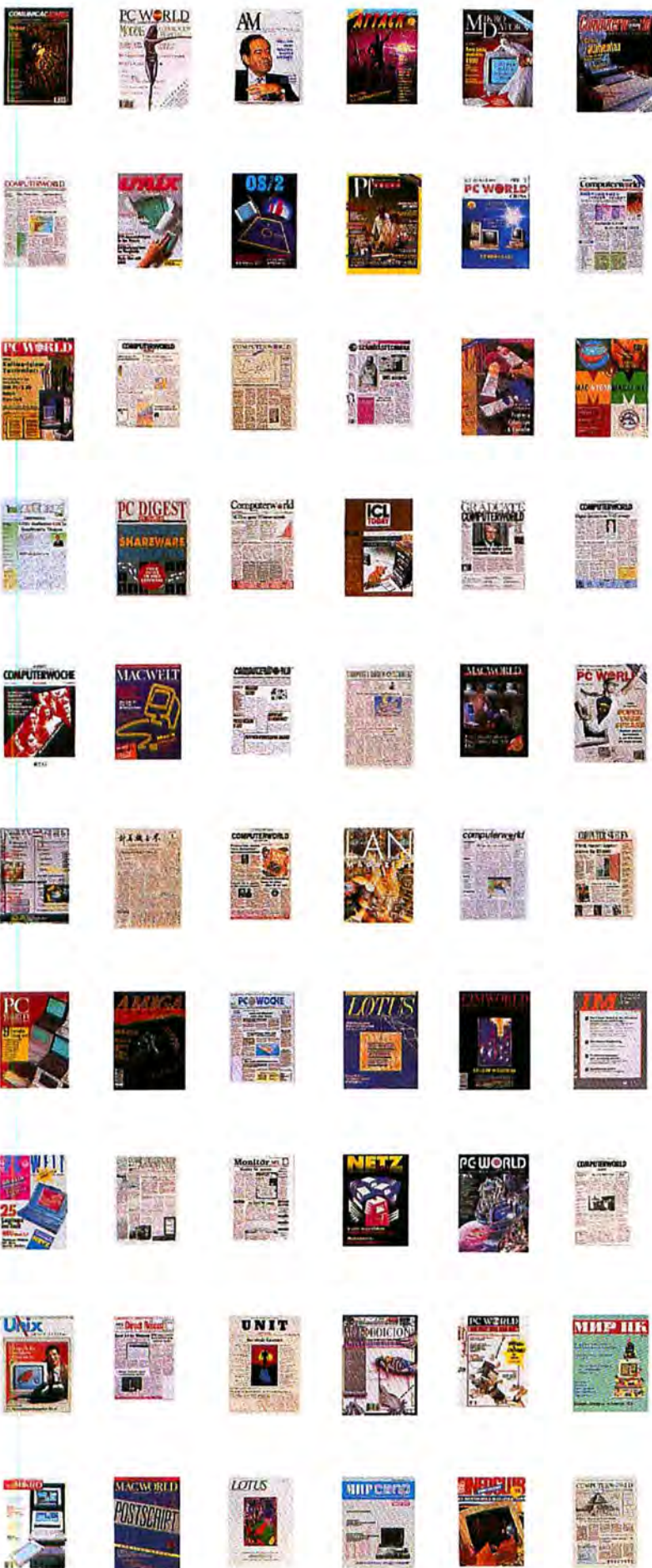
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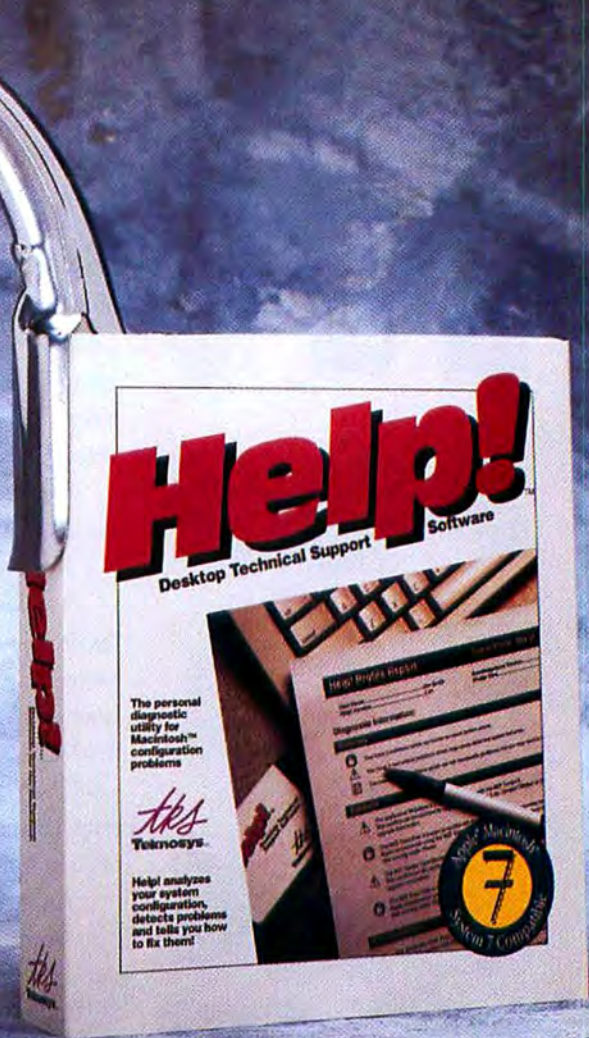
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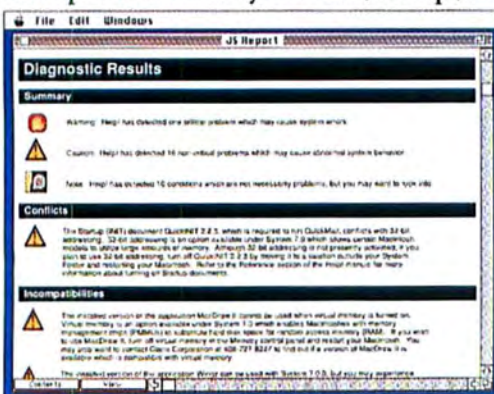
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Ethernet/color board, Sep 19
 Mac-to-Mac, Oct 191
 management products, Feb 152
 NetOctopus, Nov 17
 Net Watchman, Dec 188
 Network DiskFit, Jul 228
 NuBus gateways for IBM's SNA, Nov 18
 NuvoStar network hub, Nov 157
 Public Folder, Sep 269
 SNMP protocol adopted by Apple, Aug 89
 StarController, Jul 163
 Talk/Manage, Jul 18
 TCP/Connect II, Jan 207
 Timbuktu, Jun 23, 105
 WatchTower, Aug 89
 Network SuperVisor, Feb 152
 New Grolier Electronic Encyclopedia, 1990 Edition, May 168
 NewLife 25 and 33 accelerator boards, Jul 210
 Newsletters, Mac-related, Jul 141
 Nexta, Jul 155
 Nextstation and Nextcube, Jan 160
 NightWatch, Jun 122
 Niscan Spectra scanner, Nov 242
 Nisus, Feb 215, May 36, Sep 160
 Norton Utilities for the Macintosh, The, Feb 213, Mar 130, Jun 209, Aug 189
 Notebook computers, May 23
 Notebook System series portables, Sep 19
 Nova hard drive, Mar 136, Sep 184
 Novel-writing AI system, Jul 155
 Now Utilities, Mar 130, Jul 239
 NuBus expansion chassis, Jan 17
 NUDIST, Jun 109
 NumberMaze Decimals & Fractions, Oct 173
 NuTek Macintosh clone, Apr 116
 Nutmeg 19 Color System monitor, Oct 114
 Nutmeg 19 monitor, May 132
 Nutmeg 19G monitor, May 132
 Nutmeg/Xerox Full Page Display, May 132
 NuVision video board, Feb 178
 NuVista+ video board, Feb 178
 NuvoLink series Ethernet connectors, Apr 130
 NuvoStar network hub, Nov 157

Oasis, Jul 221
 OctColor printer, Feb 168
 OCRs, Nov 169

ReadRight, Feb 18
 Typist handheld, Feb 231, Jun 154, Nov 171
 Offline, Apr 178
 Okidata OL840 LED Page Printer, May 142
 Olsson, Sören, interview, May 87
 OmniMedia 3c scanner, Jun 130
 OmniPage, Nov 169
 On-Command, Jan 40
 On Cue, Mar 130
 Online services list of, Jan 234
 Prodigy, Jan 69, Mar 63, Apr 51, Jun 17, Jul 40
 reader survey, Oct 103
 On Location, Mar 130
 One Shot, Jul 249
 One-Step, Jun 146
 OnTrack, Mar 152
 Open Scripting Architecture, Nov 159
 Optirase erasable optical drive, Jun 138
 OptiServer 600 erasable optical drive, Jun 138
 Optix, Nov 18
 Oracle Card, Apr 17
 Oregon Trail, The, Oct 176
 Organizer, Dec 152
 Org Plus for Macintosh, May 187
 Orient, The, Sep 255
 Outbound Notebook System family, Nov 153, Dec 167
 Outbound portable, Feb 73
 Outdoor and Vacation Adventure Guide, Apr 124
 Outliners
 Inspiration, Dec 195
 More, Jan 259

P

PageBlast PostScript rasterizer, Apr 99
 Page Director, Feb 117, May 170
 Page layout. See Desktop publishing
 PageMaker. See Aldus PageMaker
 PageSpeed, Sep 129
 PageView GS monitor, Feb 119
 PageView Multi-Mode monitor, May 132
 Painter, Sep 131
 Panorama II, Aug 85
 Paper Keyboard, Jul 234
 Pararena, Jan 77
 PassProof, Oct 155
 Passwords, finding forgotten, Aug 172
 PC. See IBM PC
 PCPC II 19 Display System, Oct 114
 PCPC CGC II/24 display board, Jan 152
 PC Scan 3000 scanner, Oct 146
 PC-VCR, Jan 101, Feb 178, Oct 154
 Peacock, Jun 190
 Pentax IQ Scan scanner, Oct 146
 People's Seismograph

Array, May 109
 Peripheral Vision Storage PV-250T tape drive, Nov 176
 Personal Color Scanner, Jun 130
 Personal FileLock, Jun 122
 Personal Finance, Mar 152
 Personality, Feb 222, Jun 209
 Personal Label Printer, Aug 87
 Personal LaserWriter LS printer, May 103, 142
 Personal LaserWriter NT

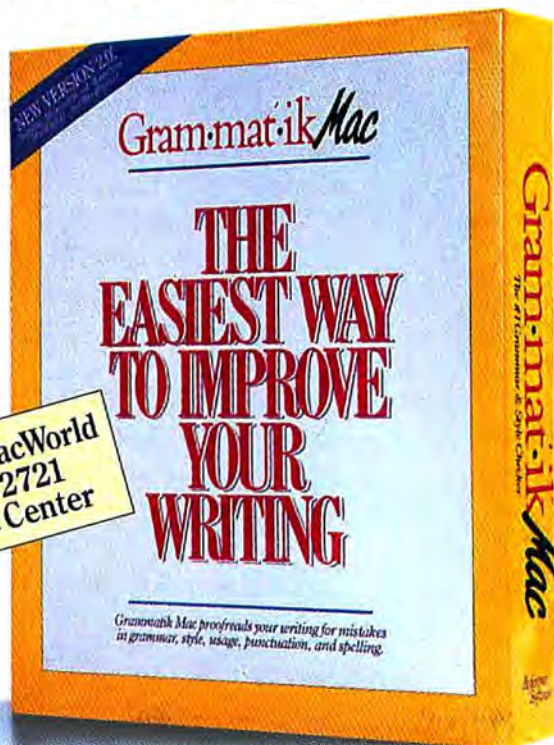
and 5C printers, May 142
 Personal Librarian, Jul 159
 Personal Press, Aug 159
 Personal Training Systems, Dec 199
 Personal Vision video board, Feb 178
 Phaser II PXI printer, Nov 151
 Phaser II SX printer, Mar 105
 PhaserJet PXI printer, Aug 85
 Phaser II PX printer, Feb

168, Mar 105
 PhoneNet Card for Ethernet, Apr 130
 PhoneNet CheckNet, Feb 152
 PhoneNet Liaison, Feb 152, Apr 130
 Photo editing, Apr 144, Nov 291, Dec 233
 Adobe Photoshop, Sep 135, 248, Nov 291
 Aldus Digital Darkroom, Sep 226
 ColorStudio, Jan 144, Apr 144, Sep 135

Enhance, Nov 231, 291
 Picture Desk, Aug 81
 Photon Paint, Apr 144
 Photoshop. See Adobe Photoshop
 PhotoYCC color standard, Feb 129
 Phovos 400C scanner, Aug 167
 Phovos 600GS scanner, Aug 87, Oct 146
 PictureBook+, Jun 99
 Picture Desk, Aug 81
 Pinnacle Micro REO-130 continues

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and REO-650 erasable optical drives, Jun 138
 Pivot monitor, May 132
 Pixel-Flipper, Oct 197
 PixelGrabber video board, Feb 178
 PixelPaint, Apr 144
 PixelPaint Professional, Apr 144, Sep 209
 Insights, May 235
 PixelView I and II monitors, May 132
 Platinum hard drive, Mar 136
 Platinum PD series hard

drives, Jul 184
 Playmaker Football, Feb 220
 PLI CD-ROM drive, Oct 184
 PLI PL Turbo series hard drives, Jul 184
 Plottergeist, Feb 236
 PL Quantum hard drive, Sep 184
 PL Turbo hard drive, Mar 136
 PocketDrive, Dec 111
 PocketHammer hard drive, Mar 136, Sep 184

Pocket Info Pac, Apr 95
 Point of View, Jan 214
 Police Quest, Sep 20
 Portables
 Colby ClassMate, Sep 141
 Outbound Notebook System family, Feb 73, Sep 19, Nov 153, Dec 167
 PowerBook series, Dec 130
 PowerBook series, Dec 130
 PowerCache ILC accelerator board, Jul 210

PowerCache accelerator board, Dec 117
 PowerCard 030 accelerator board, Jul 210
 Power Drive 150 Tape drive, Nov 176
 PowerDrive 320I hard drive, Jul 184
 PowerDrive hard drive, Mar 136, Sep 184
 PowerDrive Removable drive, May 124
 PowerDrive series hard drives, Jul 184
 Power Key, Dec 152

Power supply protection, Feb 275
 Power switch, unexpected start-ups, Jul 263, Dec 225
 PrecisionColor 8X and 24X NuBus graphics adapter boards, Dec 115
 PrecisionColor graphics board, Nov 153
 Prepress, Jul 23, Oct 138
 Introduction to Digital Color Prepress, An, Jan 231
 Presentations
 LiteShow II, Sep 237
 Magic, Sep 137
 Presenter Professional, Jan 18
 Presenter Professional, Jan 18
 Pressure-sensitive tablets, Apr 144
 Printers, Feb 168, May 142, Dec 156
 alternative print media, Sep 285
 BLP Elite, Nov 226
 Business LaserPrinter IIS, Feb 200
 color, Feb 168
 colorizing laser output, Sep 285
 Colormate PS Model 40, May 17
 ColorPoint PSX, Nov 18
 CrystalPrint Publisher, Jan 42
 DynoPage, Sep 230
 Ektaplay 7016PS, Apr 18
 enhancing images, Apr 195, Dec 233
 envelope printing, Apr 99
 Epson America EPL-7500, May 105
 Error -42 message, Jul 263
 EtherPrint, Jan 202
 fixing uneven toner distribution, Oct 212
 GCC PLP II, May 18
 HP Deskjet, Jul 18
 HP DeskWriter C, Oct 91
 HP LaserJet IIP, Feb 42, May 142
 HP LaserJet III, Jul 157, Dec 156
 HP LaserJet IIIP and IIIS, Jul 157, Dec 156
 HP PaintWriter, Jun 111
 HP PaintWriter XL, Feb 168
 ImageWriter II, Sep 270
 Kensington Printer Muffler, Dec 152
 Kodak Diconix Color 4, Apr 97
 labels, Sep 285
 LaserJet IIP, May 18
 LaserMaster 800, 1000, 2000, Dec 156
 LaserMax 1000, Mar 161
 LaserWriter II light stays on, Feb 267
 PageBlaster PostScript rasterizer, Apr 99
 paper suppliers, Sep 285
 Personal LaserWriter LS, May 103, 142
 Personal LaserWriter NT and SC, May 142

personal page printers, May 142
 Phaser PX, Feb 168, Mar 105
 Phaser II PX and Phaser II SX, Mar 105
 Phaser II PXi, Nov 151
 PhaserJet PXi, Aug 85
 QMS-PS 410, Feb 200, May 142
 QMS-PS 815, Jul 161, Dec 156
 QMS-PS 815 MR, Sep 20, Dec 156
 QMS-PS 825 MR, Sep 20
 QMS-PS 2000, Jun 111
 Silentwriter2 990, Jul 161, Dec 156
 StyleWriter, May 103, Sep 272, Dec 63
 SuperSpool, Sep 272
 Printware 720 IQ Pro-11 printer, Dec 156
 Private Eye miniature display, Apr 95
 Procom Technology MD420 hard drive, Jul 184
 Procom Technology MD Series hard drives, Mar 136, Sep 184
 Procom Technology MEOD-650 erasable optical drive, Jun 138
 Procom Technology MRD 40 removable-cartridge drive, May 124
 Procom Technology MTD1000 hard drive, Jul 184
 Procom Technology PMT60/M and PMT150/M tape drives, Nov 176
 Prodigy, Jan 69, Mar 63, Apr 51, Jun 17, Jul 40
 ProDisc hard drive, Mar 136
 ProDisc removable-cartridge drive, May 124
 Professor Mac, Apr 177
 ProfitAbility Professional, Nov 186
 Programming
 CodeCheck, Nov 240
 Series Developer, Mar 179
 Pro hard drive, Mar 136
 Project management, Mar 211
 FastTrack Resource, May 18
 MacProject II, Jun 231, Aug 171
 MicroPlanner Manager, Oct 20
 Microsoft Project, Sep 129, Nov 210
 Schedule Publisher, Oct 20
 ProModem 24/96 and 9600M Plus fax modems, Aug 114
 ProModem MiniFax fax modem, Aug 114
 ProModem Ultima fax modem, Aug 114
 ProNode device controller, May 113
 ProPlus Accounting,

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Circle 41 on reader service card.

Nov 186

Protector Shark, Jun 190
Protege hard drive, Sep 184
ProVideo 32 video board,
Feb 178
ProView/8 monitor,
Oct 114
Pserve, Feb 152
Public Folder, Sep 269
Publish-It Easy, Oct 20
Punchdown block, defined
at last, May 36
PuzzleMaker, Aug 171
Pyro, Mar 130

Q

QCT-Bone Mineral Density
Analysis, Mar 103
QMS-PS 410 printer, Feb
200, May 142
QMS-PS 815 printer, Jul
161, Dec 156
QMS-PS 815 MR printer,
Sep 20, Dec 156
QMS-PS 825 MR printer,
Sep 20
QMS-PS 2000 printer,
Jun 111
Quadra 700 and 900,
Dec 140
Quality Artware, Feb 240
QuarkXPress, Feb 46, 142,
184, May 17, Jul 17
document recovery,
Jul 264
enhancing gray shading,
Apr 195
Insights, Feb 283
Page Director, Feb 117
proofing spot-color text,
Feb 270
retaining imported Word
document's style,
Oct 214
trapping, May 159,
Aug 31
Xtensions, Jul 165
QuickCapture video board,
Feb 178
QuickColor Graphics
Engine accelerator
board, Jan 136
Quicken, Mar 152, Oct 20,
Dec 181
QuickKeys, Mar 130, Apr
138, Jul 39, Nov 159
QuickKeys², Jan 178
QuickImage 24 video
board, Feb 178,
Oct 164
QuickLock, Jun 122
QuickMail, May 18,
Sep 269
QuickTime, Aug 80,
Sep 25, 154,
Nov 194
QuickView Studio video
board, May 107,
Feb 178
QuickView Z21 monitor,
Oct 166
Quik30 accelerator board,
Jul 210
Quill, Jan 77
QuitFinder FKey, Oct 197
Qume QM880 and
QM885 monitors,
May 132
Quotemaster Plus/Mac,
Jun 189

R

Racal-Interlan NIA310
MacConnect Ethernet
connector, Apr 130
Radius 68040 accelerator
board, Apr 17
Radius Accelerator 25
board, Jul 210
Radius Color Display
monitor, Oct 114
Radius Color Pivot
monitor, May 17, Jun
103, Oct 114
Radius FPD monitor,
Jul 159
Radius Rocket accelerator
board, Dec 167
Radius TPD/19 and TPD/
21 monitors, May 132
RadiusTV video board,
Feb 178
Radius Video Collage
Engine, Jan 99
Rags to Riches for Ac-
counting, Nov 186
RagTime, Jun 18
RamDisk +, Oct 197
RandomFonts, Jan 103
Random House Encyclope-
dia, Electronic Edition,
May 168
RasterOps 8LC and 8XLI
System monitors,
Oct 114
RasterOps 24L display
board, Jan 152
RasterOps 24S graphics
accelerator board,
Jan 136
RasterOps 24si color/
accelerator board,
May 111
RasterOps 24STV video
board, May 111
RasterOps Accelerator
board, Jan 136
RasterOps display boards,
Feb 119
Ray Dreams Designer, Mar
97, Sep 244
Read My Lips, Nov 246
Reader, Jan 77
ReadingMaze, Nov 233
Read-It Personal OCR,
Nov 171
Read-It Pro OCR, Nov 171
ReadRight for Macintosh
OCR, Nov 171
ReadRight OCR, Feb 18
ReadStar II Plus for the
Macintosh OCR,
Nov 171
Real Estate Investment
Analysis, Jul 250
Real estate programs, Mar
152, Jul 250
Recognize OCR, Nov 171
Redux, Mar 130
Relax Technology 60 Tape
Vista and 160 Tape
Sierra tape drives,
Nov 176
Relax Technology 250
Tape Vista tape drive,
Nov 176
Relax Technology Mobile
42 removable-cartridge
drive, May 124
Remember, Nov 261

Reminder programs,
Nov 261

Removable-cartridge
drives, May 124
Bernoulli 90, Oct 93
Bernoulli series, Jun 18
Bernoulli Transportable,
Feb 234
Bernoulli Transportable
90, Dec 190
compatibility among
different brands,
Aug 189
DataPak 88 series,
Jun 101
formatting, Aug 189
Infinity 88 Turbo, Jun 101
MicroNet MR-90,
Jun 101
Microtech R50, Feb 234
SyQuest, Feb 113
SyQuest 88MB, May 17
SyQuest SQ5110,
Jun 101
Rendezvous Plus, Nov 261
Report Ideas, Jan 218
ResEdit, Jun 203, 209
Resource editing, Jun 219
Restart switch, replacing,
Mar 195
ResumeMailer, Jul 249
Revolución, Apr 124
Rich Text format, Dec 17
Right Time, The, Mar 152
RightWriter for the Mac,
Aug 138
Rival, Feb 211, Mar 130
RoboSport, Sep 217
Rodime Systems R45 Plus
removable-cartridge
drive, May 124
ROMs, 32-bit support,
Nov 18

S

SAM, Feb 211, Mar 130
SAM Intercept, Apr 192
SampleCell, Jun 169
Sankyo MT-500-RF and
MT-1000-RF tape
drives, Nov 176
Saturn V, Dec 117
SBT Mac Series Six Plus,
Nov 186
Scan 300/Color scanner,
Jun 130
ScanMan Model 32 hand-
held scanner, Jun 154
Scanmaster 3 scanner,
Jun 130
Scanners, Jun 130, 154,
Oct 146
aligning documents,
Nov 289
Apple OneScanner,
Dec 109
Chinon America DS-3000
Color Scanner, Nov 242
color, Jun 130
Enhance, Nov 231
enhancing images,
Dec 233
Epson America ES-300C,
May 164, Jun 130
Expresso slide scanner,
Nov 153
gray scale, Oct 146
hand-held, Jun 154
HP ScanJet IIC, Nov 157
LightningScan Compact,
Dec 152, 172
Marstek M800, Jan 17
Mitsubishi SC-7500,
Jul 233
Niscan Spectra, Nov 242
Phovos 400C, Aug 167
Phovos 600GS, Aug 87
scanning slides and
negatives, Apr 192
UMAX UC300, Jan 99
Schedule Publisher, Oct 20
Scheduling
Meeting Maker, Nov 239
Microsoft Schedule+,
Nov 239
Schedule Publisher,
Oct 20
WordPerfect Office,
Dec 170
Scientific applications,
Aug 130
Scion Image Systems
Image Capture Board,
Feb 178
Scrapbook, Jan 237
Screen Locker, Jun 122
Screens. See Monitors
Screen savers
After Dark, May 195, 218
More After Dark, Volume
One, Dec 184
Protector Shark, Jun 190
ScriptEdit, Jun 190
Scrolling speeds, Mar 195
SCSI Info, Oct 198
SCSI Probe, Mar 197, Aug
189, Oct 197
SCSI Tools, Mar 197,
Aug 189
Sculpt 4D, Nov 151
Secret Service follies,
Mar 51
Sectel 2500 and 3500
phone security, Jan 115
SecureInit, Jun 122
Security, Jun 122
A.M.E., May 172, Jun
122, Sep 20
Citadel, Sep 20
locking floppy disk drive,
Sep 55
MasterKey, Aug 172
PassProof, Oct 155
Selectics, Dec 117
Sensible Grammar,
Aug 138
Sentinel, Jun 122
Serius Business, Jan 103
Serius Developer, Mar 179
Server hard drive, Mar 136
Service Industry Account-
ing, Nov 186
ShadowGraph, monitor,
May 132
Shareware, Jan 77, Oct 197
AppDisk, Oct 197
CheckList, Jan 18
Compact Pro, Oct 197
FlashWrite, Dec 152
MaxAppleZoom, Jan 77,
Feb 263, Oct 197
Pixel-Flipper, Oct 197
QuitFinder FKey, Oct 197
RamDisk +, Oct 197
SCSI Info, Oct 198
SCSI Probe, Mar 197,
Aug 189, Oct 197
Switch Boot, Oct 197
Temperament, Oct 197
Sharp Ink Jet Color Image
continues

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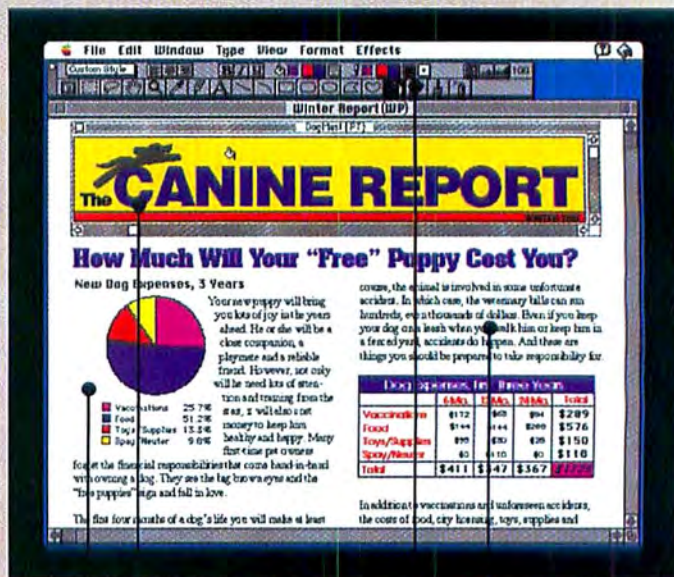
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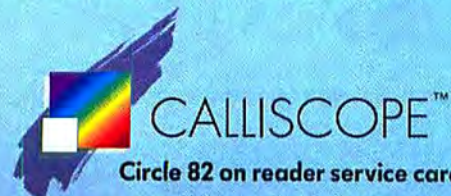
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- Printer, Feb 168
Sharp JX-100M handheld scanner, Jun 154
Sharp JX-300, JX-450, and JX-600 scanners, Jun 130
Sherlock Holmes, Sep 255
Shortcut, Mar 130
Siclone SI3033 and SI3050 accelerator boards, Jul 210
Sierra hard drive, Mar 136, Sep 184
Sigma Bullet 3040 compression board, Apr 95
Silentwriter2 990 printer, July 161, Dec 156
Silhouette Trackball, Dec 152
Siverscanner, Jun 130
SilverView monitor, May 132
SimAnt, Dec 17
SimEarth, Jun 162, Sep 269
SimMac, Nov 253
SIMMs, replacing, Oct 212
Simulation of Acute Myocardial Infarction, A, Apr 124
Sketch, Oct 91
Slides, scanning, Apr 192, Nov 153
Small Business Accounting System, Nov 186
Smart Alarms, Nov 261
Smart Art, Aug 122
SmartCards, May 196
Sniffer, Feb 152
SoftPC for the Classic/LC IBM PC emulator, Nov 224
Software Bridge Macintosh, Apr 173
Software FPU, Sep 274
Solarian II, Jan 77
Soliloquy, May 105
Sound. See also Music additional beep stored in Scrapbook, Nov 289
At Your Service, Nov 246
digital audio, Feb 160
Interface Agent, Jan 107
MacRecorder, Nov 276
Read My Lips, Nov 246
recording with Sound Control Panel, Nov 276
SoundEdit, Jul 17, Nov 276
SoundMaster, Jan 77, Jun 209
Southwest Collection, Aug 172
Space Quest IV, Sep 20
Spaceship Warlock, Sep 129, Oct 180, Dec 152
Specialized Computer Systems NTSC Converter, Feb 178
SpectreScan, Jun 130
Spectrum/8 LC and Spectrum/8 si display boards, Jun 17, Jul 155
Spectrum/24 PDQ accelerator board, Jan 136, 152
Spectrum/24 Series III accelerator board, Jan 136, 152
SpeedLink series Ethernet connectors, Apr 130
SpeedPlanner, Sep 129
Spinnaker Plus, Nov 194
Spreadsheets. See also Microsoft Excel Lotus 1-2-3 for the Macintosh, Aug 85
Masquerade, Oct 182
Wingz, Jul 266
SpreadSheets, Dec 152
Spreadware Accounting, Nov 186
Spyglass Dicer, Transform, and View, Mar 172
Stained Glass, Jan 77
StarCommand, Feb 152
StarController network hub, Jul 163
StarDrive 45RX removable-cartridge drive, May 124
StarDrive 150TX tape drive, Nov 176
StarDrive DX hard drive, Mar 136
StarDrive hard drive, Sep 184
Statistics KaleidaGraph, Sep 253
StatView Student, Nov 244
StatusMac, Feb 152
StatView, Oct 95
StatView Student, Nov 244
Stealth 425Q hard drive, Jul 184
StickyKeys, Jul 263
Stingray Ergonomic Trackball, Sep 143
Stock market investment programs, Mar 152
Stock Watcher, Mar 152
Storage Dimensions internal hard drives, Feb 119
StrataVision 3d, Jun 18
String Quartet, The: The Essence of Music, Mar 164
Studio/8, Apr 144, Jun 182
Studio/32, Apr 144, 154
StudioVision, Feb 160
Stuffit, Jan 235
Stuffit Deluxe, Jun 122, Jul 222
StyleWriter printer, May 103, Sep 272, Dec 63
Suitcase II, Feb 266, Mar 130, May 152, Nov 278
increasing limit on files open, Jul 163
SUM II, Mar 130, Jun 122, Aug 189
Sumo Systems SSER50 removable-cartridge drive, May 124
SuperBaby hard drive, Sep 184
SuperClock, Jan 77
SuperDisk, Apr 18
SuperDrive, Sep 269
SuperImage, Apr 124
SuperMac Technology 16" Trinitron Display, Oct 114
SuperMac Technology 19" Dual Mode Trinitron Display, Oct 114
SuperMac Technology 19" Platinum Display and Platinum Two-Page Display, May 132
SuperMac Technology 19" SuperMatch Color Display, Oct 114
SuperMac Technology 21" SuperMatch Two-Page Color Display, Oct 114
SuperMac Technology Graphics Accelerator board, Jan 136
SuperSpool, Sep 272
SuperSqueeze, Jan 17
SuperStacks contest, Apr 124
Surge protectors, Feb 275, Mar 196, Jul 46, Nov 39
Swift hard drive, Mar 136
Switchboard keyboard, Feb 198
SyncSatellite router, Dec 18
SyQuest 88MB removable-media drive, May 17
SyQuest cartridges, data recovery service, Jun 18
SyQuest SQ5110 removable-cartridge drive, Jun 101
System 7, Jul 194, 269
32-bit addressing fix, Nov 275
aliases, Dec 230
compatibility problems, Dec 225
hiding windows to speed screen redraw, Sep 269
installing DAs, Nov 278
installing extensions and cdevs, Oct 214
switching between System 6 and, Oct 197
System Folders, multiple, Mar 195

T

Table editors, Sep 19
Tactician, Jan 17
Talking Moose, Dec 152
TalkManage, Jul 18
Tape drives, Nov 176
MacBack 8000, Mar 171
Taste, Sep 160
Tax preparation programs, Mar 152
MacInTax, Apr 209
TaxSmith, Mar 152
TCP/Connect II, Jan 207
Technical Introduction to the Macintosh Family, Jul 264
Technical support, Sep 95
Technology Works Mac II/10T Ethernet Kit, Apr 130
Tecmar QT-Mac40 and QT-Mac80 tape drives, Nov 176
Telecommunications. See Communications
TelePort/Fax 9600 fax modem, Aug 114
continues

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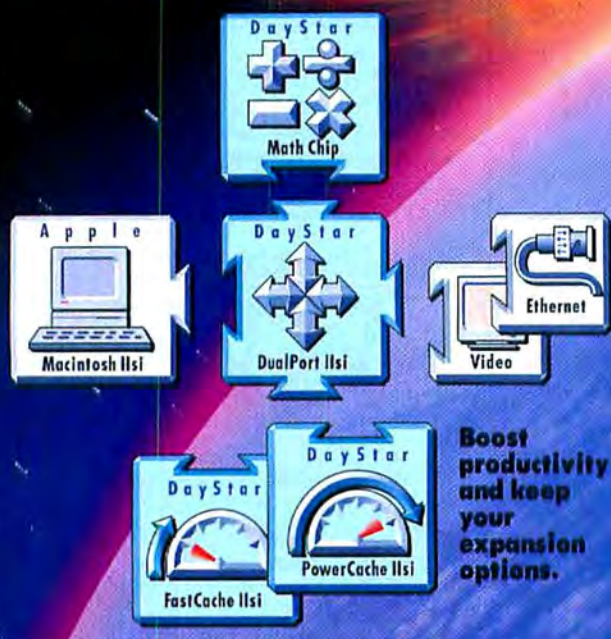
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MACWORLD INDEX

- TelePort/Lap fax modem, Dec 115
Temperament, Oct 197
Tempo II Plus, Apr 138
Teremoto, Apr 124
Terrorist Group Profiles, Dec 152
Tesserae, Nov 248
Third Wave 45R and 45DR removable-cartridge drives, May 124
Third Wave 150T and 600T tape drives, Nov 176
Third Wave X hard drive, Mar 136, Sep 184
ThoughtPattern, Jan 18, Jun 182
Thunder/8 and Thunder/24 graphics/accelerator boards, Oct 19
ThunderScan Plus scanner, Oct 146
Tidalwave 650 erasable optical drive, Jun 138
Timbuktu, Feb 152, Jun 23, 105
Timbuktu/Remote, Feb 152
Timbuktu/Remote Access Pack, Feb 204
TimeLogger, Jan 77
TI microLaser XL P535 printer, Dec 156
TokaMac LC 68040 accelerator board, Apr 17
TokaMac LC, SX, and CI accelerator boards, Dec 167
TopDown, Oct 186
Toshiba America TXM-3300A CD ROM drive, Jul 17
Total Peripherals Hard Disk, Sep 184
Total Peripherals TP44-R removable-cartridge drive, May 124
Total Peripherals X hard drive, Mar 136
Totem IV and Totem IIID removable-cartridge drives, May 124
TouchBase, Sep 233
Touchstone, Dec 115
TrackMate, Feb 240
Traffic Controller, Jul 17
TrafficWatch II, Feb 152
Training, Dec 199
Baobab Individual Learning Courses, Aug 171
Microsoft Excel Tutorial, Apr 124
TrakHur, Jan 215
Trapping, May 159, Aug 31, Sep 55
TravelModem fax modem, Aug 114
Trax, Jun 146
Trick or Treat, Jul 250
TrueType, Sep 194
Truevision NTSC VIDI/O Box, Feb 178
Tsunami 80-Q hard drive, Apr 171
Tsunami hard drive, Mar 136, Sep 184
TurboPS/480 printer, Dec 156
TurboStar, Feb 152
TurboTax, Mar 152
Tutorland, Dec 199
TV Board and TV Box, Feb 178
TV Producer-Pro and TV Producer-RGB, Feb 178
Tycho, Sep 19
TypeChart, Apr 124, Jul 249
TypeStyler, Aug 122
Typist handheld OCR, Feb 231, Jun 154, Nov 171
- U**
UltraDrive 50R removable-cartridge drive, May 124
UltraDrive hard drives, Mar 136, Sep 184
UltraDrive S hard drive, Sep 184
UltraKey, Jul 40
UltraPaint, Apr 144
UltraSecure, Jun 122
Umax Technologies UC300 Color Scanner, Jan 99, Jun 130
Umax Technologies UG80 Grayscale scanner, Oct 146
Univation Q50 removable-cartridge drive, May 124
UNIX, TCP/Connect II, Jan 207
Upfront, Mar 109
Upgrades, Apr 197, Jul 176, Aug 189
Macintosh Classic, Jan 17, Feb 119
Macintosh SE, Jan 18
Microtech I/O-1, Feb 119 replacing SIMMs, Oct 212
User groups, finding, Feb 40, May 214
U.S. History on CD-ROM, Sep 255
Utilities, Mar 130
AppDisk, Oct 197
backup, Jul 228
Cataloger, Feb 240
Compact Pro, Oct 197
DiskExpress II, Jul 18
Disk First Aid, Feb 263
DiskFit, Mar 130, Jul 228
DiskFit Pro, Nov 18, Dec 17
DynaPage, Sep 230
FolderJump, May 196
font, May 152
Font/DA Mover, Nov 278
Image Grabber, Jul 246
InTouch, May 183
JClock, Oct 212
KiwiFinder Extender, Feb 239
Last Resort, Sep 235
macros, Jan 178, Mar 130, Apr 138, Jul 39, Nov 159
MacSleuth, Feb 239
MacTools Deluxe, Jan 210, Jun 122, Aug 189
MasterJuggler, Feb 226, Mar 130, Apr 191, May 152, Jul 263
MaxAppleZoom, Jan 77, Feb 263, Oct 197
- MediaTracks, Jan 198, Nov 194
MockPackage Plus Utilities, Jul 264
Mode32+, Nov 18, 275
MountEm, Aug 189
network management, Feb 159
Norton Utilities for the Macintosh, The, Feb 213, Mar 130, Jun 209, Aug 189
Now Utilities, Jul 239
Pixel-Flipper, Oct 197
QuickKeys, Apr 138, Nov 159
QuickKeys?, Jan 178
QuitFinder FKey, Oct 197
RamDisk+, Oct 197
ResEdit, Jun 203, 209
resource editors, Jun 203, 209
SCSI Info, Oct 198
SCSI Probe, Mar 197, Aug 189, Oct 197
SCSI Tools, Mar 197, Aug 189
shareware, Jan 77, Oct 197
Software FPU, Sep 274
Stuffit, Jan 235
Stuffit Deluxe, Jun 122, Jul 222
Suitcase II, Feb 226, Mar 130, May 152, Jul 163, Nov 278
SUM II, Jun 122, Aug 189
SuperDisk, Apr 18
Switch Boot, Oct 197
Temperament, Oct 197
UTPMac Ethernet connector, Apr 130
- V**
Varityper VT600W printer, Dec 156
Veloce hard drive, Mar 136
Ventura Publisher, Jun 170
Verse Search, Dec 186
Versionary, Feb 18
VidClip VideoTape Control Toolkit, Feb 178
Video, Feb 23, 178. See also QuickTime
ColorSnap 32+ video capture board, Oct 164
Commotion Technology, Jul 153
DVA-4000/Macintosh, Sep 206
MediaMaker, Aug 154, Nov 194
MediaNode, May 113
Mediator video-conversion box, Sep 206
MegaGraphics multifunction display adapter board, Feb 127
MPEG compression, Jun 18
MultiMedia Toolkit, Jan 101
multimedia tools, Jan 101, Nov 194
NEC PC-VCR, Jan 101, Feb 178, Oct 154
ProNode device controller, May 113

continues

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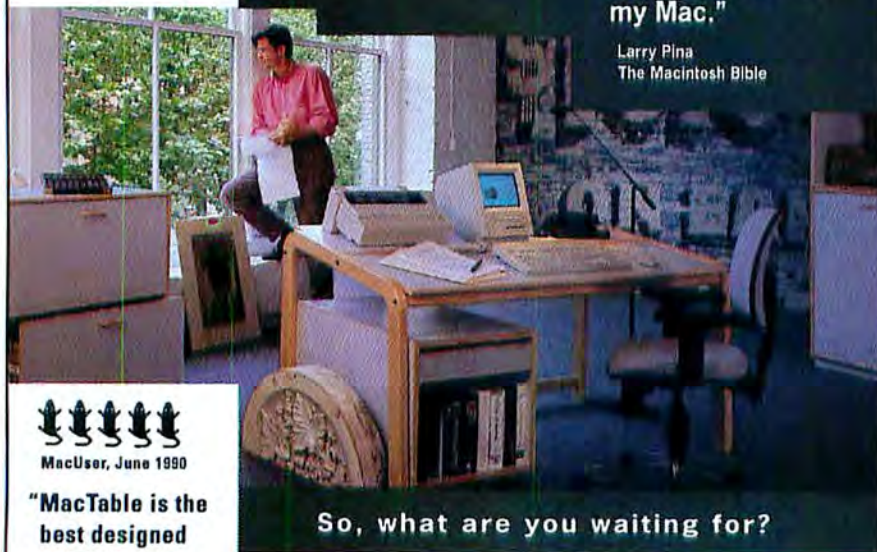
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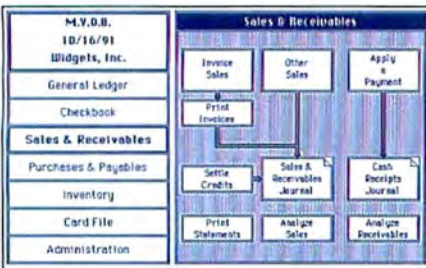
- QuickImage 24 video capture board, Oct 164
QuickView Studio, May 107
Radius Video Collage Engine, Jan 99
RasterOps 24STV board, May 111
Touchstone, Dec 115
VideoAuthor, Nov 194
VideoDiscWriter, Nov 194
Video Explorer, Feb 178
Video Master, Feb 178
Video NTSC Encoder, Feb 178
Video Publisher, May 113
VideoQuill, Jun 186
Video Toaster, May 107
VideoAuthor, Nov 194
VideoDesk 1/24, Feb 178
VideoDiscWriter, Nov 194
Video Explorer, Feb 178
Video/FX, Feb 178
Video Image 1000, 1200, 1500, and 2000, Feb 178
VideoLogic DVA-4000/Macintosh video board, Feb 178
Video Master, Feb 178
Video NTSC Encoder, Feb 178
VideoPaint, Apr 144
Video Publisher, May 113
VideoQuill, Jun 186
Video Toaster, May 107
Viking 3/72 GS monitor, May 132
Viking 3/72 M and 3/2400 monitors, May 132
Virex, Mar 130, Apr 18
Virtual memory, May 214, Jul 176, Nov 275
Virtual reality, Nov 61
Mandala, Feb 127
Virus Detective, Jan 77
Viruses/virus detectors, Jan 77, Feb 119, Mar 105, 130, Apr 103, May 113, Jun 109, Jul 165, Aug 89, Sep 139, Oct 99, Dec 115
Rival, Feb 211
SAM, Feb 211
Virex, Apr 18
WDEF, Apr 192
Visionary, May 17, Jul 17
Vista 600 hard drive, Jul 184
Vista hard drive, Mar 136, Sep 184
Voice Impact and Voice Impact Pro sound recorders, Oct 103
Voice Record, Nov 276
Voyager 030 accelerator board, Jul 210
Voyager VideoStack, The, Feb 178
V-Series Ultra Smartmodem 14400, Oct 20
- Wacky Vac, Dec 152
Wacom SP series styluses, Jun 164
- Wagon Train, Oct 176
Wall Street Investor, Mar 152
Wall Street Watcher, Mar 152
Watch, Feb 152
WatchTower, Aug 89
WealthBuilder, Mar 152, Apr 165
What-If Solver Premium Edition, Sep 20
Where in Time Is Carmen Sandiego?, Jan 200
Winer, Dave, Aug 51
Wingz, time-and-date stamping spreadsheet, Jul 266
Wip hard drive, Mar 136, Sep 184
Women Artists of Color videodisc, Apr 124, May 113
Word. See Microsoft Word
Word Count DA, Feb 240
WordMaker, Sep 160
WordPerfect, Jul 220, Sep 160
Insights, Jul 281
WordPerfect Office, Dec 170
Word processors, Sep 160. See also Microsoft Word
fixing irregular line spacing, Sep 270
FullWrite Professional, Sep 160
MacWrite II, Sep 160
Nisus, Feb 215, May 36, Sep 160
Taste, Sep 160
Word Count DA, Feb 240
WordMaker, Sep 160
WordPerfect, Jul 220, 281, Sep 160
WriteNow, Sep 160
Working Software, Jul 69
World Class Awards, Aug 104
WORM drives, Jun 138
WPduet, Feb 224
WriteNow, Sep 160
Writer's aids, Aug 138
Editorial Advisor, May 188
quotation collections, Jun 189
Report Ideas, Jan 218
WTI-Moonraker, Feb 178
WysiWord, Nov 163
- X
Xerox Imaging Systems GS Plus scanner, Oct 146
XPress. See QuarkXPress
Xyxis Corporation
XY600RW erasable optical drive, Jun 138
- Y
Your Personal Trainer for the SAT, Apr 177
- Z
Z-3 scanner, Oct 146
Zoom MX96005 fax modem, Aug 114
Zterm, Jan 77

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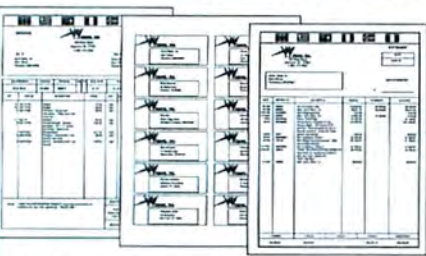
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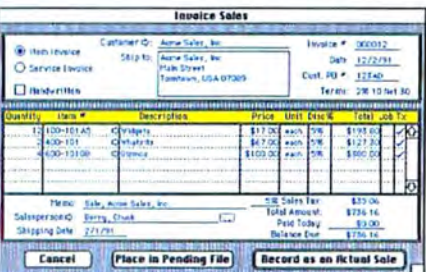
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MacWorld, November, 1991



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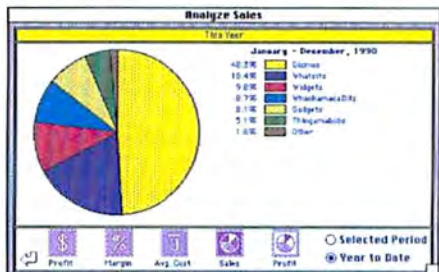
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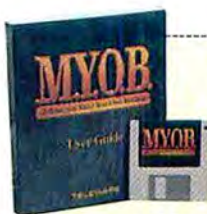
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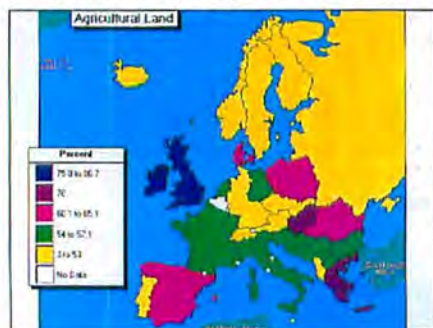
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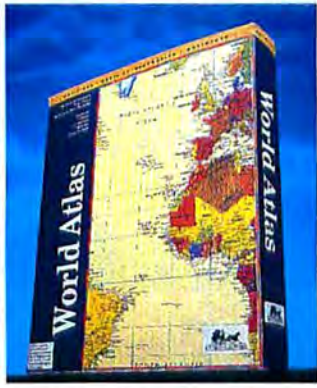
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Government — 22 topics including: Official Name, Capital, Administrative Divisions and Government Leaders.

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the NEC Multisync 3FGx. The designers and engineers went crazy on this one, packing unparalleled features and performance into this amazing new monitor. Like the new NEC FullScan capabilities, allowing you to see up to 36% more active screen display — without any distortion. Its 15" screen is flat — perfectly flat — and provides the highest refresh rate among its so-called competitors. Crisper images, brighter colors, richer tones and more contrast.

But the MultiSync 3FGx isn't just another pretty face — it's got a great body, too. The NEC ErgoDesign specialists have trimmed the MultiSync 3FGx with a

variant area: color accuracy. This new standard in video excellence is based on the concept of multiple-frequency engineering. And only NEC can do it. The award-winning 4FG is a 15" flat-screen, digitally controlled monitor that features AccuColor. This revolution allows you to adjust colors to your preferences, or to match your printer's capabilities — even match Pantone and Trimatch colors! Like the 3FGx, the 4FG provides crisp images — 36% larger! The Invar Shadow Mask (it's very technical) provides displays that are 20% brighter.

Another innovation: The MultiSync 4FG monitor's

micro-processor based memory and digital controls provide automatic sizing and centering of screen images for preset and custom graphics modes. Perfect for Windows and desktop publishing.

The Boss — The NEC Multisync 5D. The MultiSync 5D has a long list of speci-

fications, capabilities and features. It has a slew of technical innovations that set it apart from any other color display in the world. But to see what it's really all about, just look

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The Art Of The SCAN

REVIEWER'S NOTEBOOK: *The Logitech series of advanced mice and scanners has won acclaim from the press — and thousands of loyal users. No other manufacturer engineers so much precision and innovation into their products. From an incredibly sharp hand scanner, to the all new breed of "programmable" mice, they're a pleasure to work with. We put the ScanMan 32 hand scanner through it's paces, performing over 50 scans of various black and white images — photos, line art, logos, type, illustrations — even poor-quality photos. The ScanMan 32 features 32 gray scale performance, with adjustable scanning resolutions from 100 dpi for quick scans; up to 400 dpi for magnificent finished images. Use scanned images in word processors, multi-media, desktop publishing, HyperCard, OCR and more. Hold a Logitech device in your hand and you'll notice the superior craftsmanship, the precise movement of the rollers and the extra large scanning window so you can see as you scan. Scan instead of re-keying data: capture text (with OCR software) with crisp, clean results.*

The Science of Scanning. Logitech technology destroys the old barriers of scanning, increasing the speed and accuracy of anything you scan. Superior image quality, with the ability to produce halftones for reproduction. The set of output controls provide the best possible results on any printer or monitor screen. Its 4" wide scanning area allows full-page scans with just two quick passes.

And Logitech's rugged construction and precision roller system allows straight, unwaivering scans. No curving, no skipping. The scanning speed indicator controls the movement for perfect scans every time. There are three settings for scanning photos and another for scanning line art. Its shape is perfect, its weight and components distributed equally for balance. All of which makes getting an image from paper—into your Mac, simple and easy.

The ScanMan 32 gives you a free set of software editing tools, including a 32 gray scale palette for detailed retouching. There's also a handy dimension box and tear off tool palette; use them alone or incorporate them as a desk accessory. Pop up real-time brightness and contrast controls, refine images with amazing flexibility, rotate, flop and invert images. Save your scans in a variety of formats, including MacPaint, TIFF and PICT).

Here's What You Get: The ScanMan 32 contains everything you need. The Model 32 Gray Scale scanner, SCSI interface box and cable, power supply adaptor, ScanMan software, version 2.0, CatchWord Pro OCR software and complete user guide. Fast, easy, compatible — and powerful — the ScanMan 32 is a superior hand scanner.

FREE with the ScanMan 32 — CATCHWORD PRO: Powerful Optical Character Recognition (OCR) software that allows you to capture printed, hard-copy data by scanning it, rather than typing it. But, without quality software and a high quality scanner (like the ScanMan 32), scanning text won't work properly.

"Dirty" scans produce unwanted characters a commands, requiring enormous cleanup — creating more work than rekeying.

CatchWord Pro delivers an amazing 99% accuracy in OCR testing, used in tandem with the ScanMan 32. CatchWord Pro is compatible with popular word processors, spreadsheets, databases and desktop publishers — so you can scan information directly into your application and use it immediately. Different types and sizes are no problem, printed characters, in any size of typeface are instantly recognized. It will even automatically convert two scans into one, full-page image.

What about larger, memory-intensive photos and pages packed with small type, don't they slow your system to a crawl? The answer is "no" and only Logitech can say that. While other scanners are notorious for system slowdown, all of your ScanMan 32 scans zip along with Logitech's ingenious memory management features that automatically swap image data between your system's RAM and hard disk.

The instrument itself is a masterpiece. From the genius of the respected industrial design firm Frogdesign — also responsible for the new line of NEC monitors and other distinctive hardware products, the ScanMan 32 is different from the ground up. First, you'll notice that it's heavier, with precision rollers that provide more "grip" along with a superior guidance system for light-touch control. All of which means you can scan quickly and accurately — once — and capture the image perfectly. While many other hand scanners rely on you to move in a straight line as you scan, the ScanMan 32 provides fully balanced, direct movement.

Using the ScanMan 32, you can create instant layouts, experiment with backgrounds and special effects. Add text and explore sizing and cropping options within seconds. That's why the hand scanner has caught fire in the design world: its ability to let you see many different visual combinations.

Business use scanners use capture text described above and for keeping archival records of paper documents with instantaneous access. Logitech's advanced technology gives you more

flexibility, more creative tools and more value than any other scanner.

Although there are two basic scanning modes on the ScanMan, there are in fact three ways of scanning an image: Line art mode, Gray mode, or Mixed mode.

Line Art Mode. Line Art mode is useful for scanning black and white line drawings, diagrams, and text. This mode produces high-contrast images in black and white (no grays).

Gray Mode. Gray mode is useful for scanning photographs, color images, and drawings where the high contrast black or white character of Line Art mode detracts from the quality of the image.

Desktop publishing programs enable you to combine your ScanMan images with text. Most of these programs accept either PICT or TIFF format files. PICT format enables you to work with compact files, although you won't be able to change the display format of the document or the grays. In TIFF format, you can alter the screen angle, dithering options and proportions of the document.

Mixed Mode. The third, and less common method of scanning is Mixed mode. Mixed mode is useful for certain specialized applications, and for experimenting with ScanMan to produce different effects.



Actual unretouched scan.



MORE THAN JUST ONE BUTTON. Logitech is committed to providing extra ease for Mac users. The Macintosh graphic environment takes maximum advantage of the special features offered by Logitech's desktop tools. Although the single-button Macintosh mouse meets many people's needs, three mouse buttons offer the extra functionality that make Macintosh, A/UX and X-Windows systems more convenient to use.

Now, Macintosh users can save desktop space without relying on a large, clumsy ball to do it. Logitech's award-winning TrackMan® Stationary Mouse combines the advantages of both mice and trackballs in one unique device.

TRACKMAN® — High Resolution Stationary Mouse. TrackMan puts an input revolution on the Macintosh desktop. This award-winning design takes a trackball from a large center position and makes it smaller and more manageable by putting it under your thumb. It's easier to move around the screen, freeing your fingers to work the three large tactile buttons. Shaped so your hand rests on it easily, TrackMan is more comfortable than any other trackball or stationary mouse.

Stationary and easy to install: perfect for anyone with limited desktop space as it requires no additional room to move on the desktop. Just plug it into your Macintosh ADB port and you're ready to go.

3 buttons: the functionality that makes Macintosh, A/UX and X-Windows systems more convenient to use.

Easy programmability: MouseKey™ Control Panel software lets you easily program the mouse buttons for your most used keystrokes or menu shortcuts in each application. You'll save time and get everything done more easily. Once you've pro-

grammed for an application, MouseKey remembers the settings.

- **Perfect precision:** thumb-operated ball provides greatest ease, precision and comfort.

- **High resolution:** adjust the resolution from 150 to 300 dpi to get just the precision you need for every application.



MOUSEMAN™ — High Resolution Ergonomic Mouse. MouseMan is more mouse than you've ever seen before for your Macintosh. Three programmable buttons offer you ultimate flexibility — program them for the tasks you perform most

and watch your productivity rise! MouseMan offers the same high quality and excellent tracking on any surface that have built the reputation of all Logitech mice — constructed with the finest materials.

- **Evolutionary ergonomics:** the next great advance in mouse ergonomics, MouseMan features left- or right-handed versions with angled curves that fit your hand perfectly.

- **Easy programmability:** MouseKey™ Control Panel software lets you easily program the mouse buttons for your most used keystrokes or menu shortcuts in each application. You'll save time and get everything done more easily. Once you've programmed for an application, MouseKey remembers the settings. You can assign a variety of tasks: click functions, view, modify or delete — even program it to draw circles automatically.

- **3 buttons:** make Macintosh, A/UX and X-Windows systems more convenient to use.

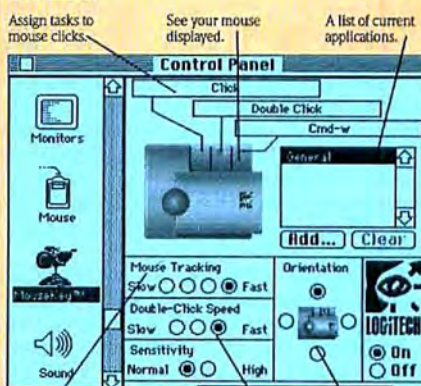
- **High resolution:** adjust the resolution from 200 to 400 dpi to get perfect precision for every application.

- **Exceptional quality:** Logitech mice meet the stringent quality requirements of both the largest systems manufacturers and our desktop customers: tested to 300 miles of life and more than three million button operations.

- **Easy to install:** just plug it into the ADB port on your Macintosh.

Programming Your Logitech Mouse.

The MouseMan Control Panel sets up your mouse buttons to do anything you want them to ... change speed, response time, sensitivity, and more.



Mouse Tracking. Set how fast the pointer moves in response to the speed of your mouse.

Sensitivity. Set the precision and distance with which the pointer travels when you move your mouse.

Orientation. Set pointer moves to match the direction in which you move the mouse.



LOGITECH

BAK2509 ScanMan 32 w/CatchWord Pro \$379.00
BAK2510 TrackMan MAC Upgrade \$69.00
BAK2511 MouseMan MAC Upgrade \$59.00
ScanMan 32: Macintosh Plus or better running System 6.0 or later
Hard disk recommended. TrackMan/MouseMan: Any ADB Macintosh running Macintosh, A/UX or X-Windows Operating Systems.

TIGERSOFTWARE

Information & Orders: 1-800-666-2562 Int'l Orders: 305-443-8212 Fax: 305-444-5010



SAME PRICE AS GROUND

Everything Begins With A Great Idea...

REVIEWER'S NOTEBOOK: It is a rare and valuable individual who can consistently come up with great ideas. Whether it's to solve a problem, build an effective business plan, create an advertising campaign or position a product. The fact is, there's no substitute for original thinking. IdeaFisher is a unique software product that actually helps you generate high-potential thoughts. It's not magic; it is designed to help you identify relevant issues, examine new perspectives and analyze existing information. It directs you towards associations between words and questions, and adds analogical reasoning (analogy and metaphor) to unearth new avenues of thought. Use it once, and you'll unlock the potential of your inner creativity, a power that everyone possesses, but only a few ever truly cultivate.

Idea Fisher is the brainchild of Marsh Fisher, co-founder of Century 21 International Real Estate Company. It is a 7 megabyte computer companion for high-powered brainstorming sessions that help you trigger new ideas. Innovative ideas, from your memory, sparked by dynamic association. It is composed of two distinct databases: QBank and IdeaBank. QBank contains nearly 6,000 questions to clarify, analyze and solidify your thoughts. When you answer questions posed in QBank, IdeaFisher generates key concepts to explore in IdeaBank. IdeaBank contains 61,000 words and phrases, 387 topical categories and 28 major categories. Its cross-referenced system provides you with over 700,000 associative links. These two sets of data link to stimulate convergent and divergent thinking, reminding you of images, facts and feelings. In all, these mental connections open the door to millions of idea-associations. IdeaFisher becomes a pipeline to rich imagery and creative solutions lodged within your memory and subconscious. Again, IdeaFisher isn't magic, it's a crowbar that loosens your own inner originality.

The IdeaBank is the "Idea Base" in which information is organized as your mind would organize it, into clusters of associations. The categories included are: Actions/motions, Agriculture, Animals, Business/industry/occupations/money, Clothing/jewelry/grooming, Colors, Communication/education/the arts, Comparison, Emotions/behavior/personality, Energy/technology, Containers/storage, Foods/cooking/eating, Government/law/politics, ... and dozens more.

IdeaFisher helps you tap your own resources, based on the powerful stimulus of language, association, memory and knowledge. That's the secret here. The more you explore a concept, based on your review of associated words and phrases, the more original thought will be uncovered. In fact, Linus Pauling's research on the subject states that the more ideas you can generate, the more likely you are to produce an excellent one.

Further, research has shown that the most innovative solutions tend to be found among the last 50% of all the answers generated on the topic, while the most obvious, unoriginal ideas tend to appear in the first 50%. That second 50% (containing the excellent idea) is often buried in our subconscious: our memory. That's why techniques of creative thinking cannot overcome one simple obstacle: our inability to remember everything we know. Whereas human beings, fortunately, have a vast capacity for recognizing important information, we have a much lower capacity for recalling it.

But how does IdeaFisher actually work? Let's begin by looking at an analogous example. Try to re-



member your high school graduation class. At one point in your life they were perhaps the most important people you could ever imagine. You knew more about them than any other group. Back then, it seemed as if they would never be forgotten; each one held a special place in your mind. But today, you might be hard pressed to remember even a small fraction of them. Their names, where they lived or what they were like. They've been covered with layers of more recent people, your wife, children, business associates and friends. But if you open your yearbook, the personalities would come rushing back, your mind would send hundreds of bits of information back to the forefront, and restore your memory with great clarity. The names, pictures and autographs would set off a flurry of associations. It would be a powerful "remembering" experience. You would be able to produce stories, facts and images that you haven't considered in years. In contrast, you could try using the phone book instead of the yearbook — with far less dramatic results. Why? Simply because most of the information would not be relevant. IdeaFisher works like the yearbook, providing vast pools of detailed information that generate associations. That's the key.

IdeaFisher embodies a system of memory and association, known as "The New 3 R's." It is a systematic approach to creative thought. These steps are: Recording information (memorization); Retrieving information (recalling and reconstructing); and Re-combining information (putting information together in different ways). Together, these steps unleash a storm of new thoughts.

Recording: When you set off to create a new idea to be used in your work, you must accumulate as much information as possible. Most successful people are curious about their subject, and therefore, usually very knowledgeable. Your mind holds a massive amount of information from your ongoing education of your industry and society. That information is stored within your memory. Recording information is the easy part and the more you know, the more material you can use to re-combine later in step 3.

Retrieving information is the most difficult and, frankly the most unreliable. IdeaFisher's two distinct databases work to jog your memory with hundreds of associative questions and words to allow your recorded information to merge, on demand, with the problem you are trying to solve.

Then, the re-combining process will yield new, fresh and innovative thinking, targeted directly at the subject at hand. IdeaFisher stores a collective memory of the common culture. Re-combining: Ecclesiastes taught us that "There is no new thing under the sun." The educator Rudolph Flesch observes that "... a new idea is the reassociation of existing ideas," — or parts of ideas — to form new combinations.

This step combines (and is dependent on) steps 1 and 2 to be effective. By acting as a warehouse of information (step 1), and by aiding in reminding you of what you already know (step 2), IdeaFisher sets the stage for the act of imagination: creating new combinations (step 3). Moreover, IdeaFisher's Modification Questions help you break through barriers of ordinary thinking and imagine the unimaginable.

Often, two simple concepts can be combined to create a new and larger idea. Like the swimming pool slide. It was brought to market by a traveling salesman who, in his travels, came upon a group of youngsters playing on a playground slide. With an eyeshot, he noticed another group of children splashing in a small wading pool. He instantly reflected on his own childhood, his early life by a lake in Minnesota. Suddenly the idea was formed: construct a slide designed specifically for a pool. That man made many millions of dollars from the strength of a single idea: relating two seemingly unrelated things into new idea.

IdeaFisher is in use today in marketing firms, corporations, engineering and planning firms, agencies, schools, law firms and everywhere that ideas can make a difference. Many of today's successful writers, inventors, trainers and students use it to enhance their creative thinking skills. Using IdeaFisher you can develop new products or services, develop names for products, position products, develop strategies, create advertising campaigns, design procedures, policies and group objectives. Writers use IdeaFisher to develop story, script and article ideas, write speeches, jokes or even legal briefs. Trainers use it to assist in counseling and personal growth skills, as well as to help students to organize thoughts and projects.

NOW AVAILABLE — SPECIALIZED QBank MODULES

Requires the IdeaFisher.

The Presentation Planning Module™: How can you be confident that you have prepared an effective presentation? Creating effective speeches and presentations is an ongoing dilemma for many people. Preparation is the key to success. Fisher Idea Systems has designed a new tool to help you structure your efforts and produce better results. The Presentation Planning Module contains over 300 specific, common sense questions that systematically guide you through the creative and planning process. The questions help you identify your primary objectives and they assist you in developing and delivering your message with confidence and effectiveness.

The Strategic Planning Module™: Where will your company be in five years, and how will you get there? Strategic Planning is the most vital issue any company or business person will have to face. It is one of the most difficult and demanding tasks you as a leader must effectively resolve.

Fisher Idea Systems has designed a new tool to help you structure your approach to the planning process and produce better results. The Strategic Planning add-in module for IdeaFisher contains more than 700 specific questions you should consider when thinking about the future.

The module consists of two components. The first, "Developing a Strategic Plan," is designed to guide you through an analysis of your current situation. This will enable you to understand your strengths and weaknesses. The second, "Implementing a Strategic Plan," is designed to guide you through the issues involved in putting your plan into action.

FISHER IDEA SYSTEMS

BAK2435 IdeaFisher	\$385.00
BAK2436 Strategic Planning Module	\$65.00
BAK2437 Presentation Planning Module	\$49.00
Macintosh Plus, SE series, or II series with 1MB RAM and 7MB of hard disk storage.	

Lotus 1-2-3 For The Macintosh!

REVIEWER'S NOTEBOOK: The thoroughbred of Macintosh spreadsheets. Not a step-child of the original DOS product, Lotus 1-2-3 for the Mac has been designed from the ground up to exploit the power and flexibility of the Mac. Revolutionizing financial software with true 3-D worksheet capabilities: Excel doesn't have it, Claris Resolve doesn't have it. Fully featured, with System 7 support; completely customizable with desktop tear-off menus; most functions require just a mouse click and it's packed with 3-D power. Excel users will be surprised at the power and grace engineered into Lotus 1-2-3 for the Mac.

Lotus' deep understanding of advanced spreadsheet and financial modeling technology is present here. True 3-D worksheet management, incredibly nimble relational database power and easy-to-use formulas. Over 14 million people rely on the Lotus concept to create budgets, perform precise forecasting and instant analysis. Proposals and presentations ring with clarity with Lotus' financial graphs and tables. It's easy to edit cells, create graphs, and import data, using the same menus, tools and file formats across worksheets, graphs and macros.

Using 1-2-3 for the Mac is fast and simple. It emulates new System 7 and provides the classic 1-2-3 menu for complete keystroke compatibility. We love the use of floating toolboxes and palettes, allowing customization of your workspace. Moving around is silky and streamlined, allowing you to quickly select ranges (before or after starting commands). You get in-cell editing and the ability to directly manipulate chart elements. You also get 256 colors, 49 different fill patterns and 230 line styles and thicknesses for use in your spreadsheets.

On to the power: Along with the brutal power of

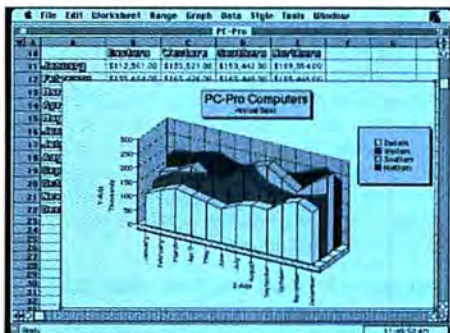
3-D worksheets, you can easily customize database forms for automatic fill-in and printing, perform a host of advanced relational capabilities, including swift queries (a particularly useful feature), an ever-active macro recorder (an incredible time saver!), and automatic compression routines for any printer. By the way, Lotus throws in a free copy of Adobe Type Manager.

With 1-2-3 for the Mac, complicated tasks, like consolidations, don't require tedious linking or endless dialog box activity, just a couple of mouse clicks is all it takes. Easily bring remote data right into 1-2-3 through DataLens and the Apple Data Access Language. Read FoxBase and dBASE files directly.

Lotus 1-2-3 for the Mac towers over the capabilities of Excel in a host of areas. Its ability to perform true 3-D functions is an enormous advantage. And the spectacular range of colors and graphic devices available within the worksheet. Excel doesn't allow pop-up functions or range names, Excel doesn't allow you to directly manipulate elements in charts, or perform in-cell editing Lotus 1-2-3 for the Mac does. Excel doesn't include relational capabilities, floating toolboxes or palettes, you can't customize your workspace or have your macro recorder on all the time. 1-2-3 does. Order your competitive upgrade today.



"Classic" 1-2-3 menus work the same as the 1-2-3 everyone knows and love. (Or use the standard Mac menus — your choice.)



Fantastic charting including 2-D and 3-D charts in numerous styles and types — all available with the click of the mouse. And only 1-2-3 has floating toolboxes for ease of use.

LOTUS 1-2-3 MAC

BAK2485 Lotus 1-2-3 Mac \$375.00
BAK2486 Lotus 1-2-3 Mac Upgrade \$99.00

The Gold-Plated Trash Can Syndrome!

REVIEWER'S NOTEBOOK: We're not sure, but we think that this is the only true trash utility in world. And while trash has never seemed like a problem area, TrashMaster provides it with some amazingly helpful capabilities. One of the most important features is in the area of security. TrashMaster actually allows you to erase confidential files completely — with no chance of recovery using even the most sophisticated utilities, and conforming to the United States Department of Defense specifications for discarding files. TrashMaster allows you to automatically empty the trash with any number of "filters" that discard what you want, when you want. Empty trash hourly, daily, or at shutdown by date, size, type or name. Selectively empty trash by just selecting from the menu. Simple, fast and a great utility that you never may have considered. Just use it once and see what you've missed.

TrashMaster includes Incinerator, a new utility for System 7 trash management, along with a variety of useful trash-related tools. TrashMaster allows manual selection for emptying trash, building a hierarchical menu from the "Empty Trash" menu item in the Finder's "Special Menu." Selecting from the hierarchical menus will empty the selection. Or, you can make everything automatic! Define any number of filters to determine what trash will be emptied. Filters include size, age, file type, creator and name. Empty trash can be done immediately, hourly, daily or at specific events such as disk eject, startup and shutdown.

The Incinerator automatically erases confidential files — for good! TrashMaster gives you the ability to always erase files that are thrown in the Finder's trash and then emptied. There is absolutely no



chance of accidentally deleting the file before incinerating.

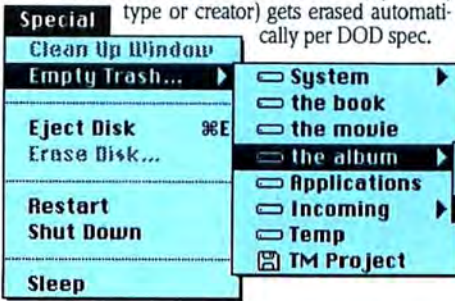
About the confidential erase feature: Based on DOD government spec, actually erases the file 3 times. Instead of just writing zeros over the contents of the file once, the file is overwritten with zeros

once, then written with ones, then with zeroes again. No chance of any recovery. Very simple to use, fast and easy to make better use of your trash.

Selectively Empty Trash. Simply select from the menu and it's gone.

Automatically Empty Trash. You choose what (by date, size, type or name) and when (hourly, disk eject, shutdown, etc.). It's fast and simple.

Erase Confidential Files. Choose what (by name, type or creator) gets erased automatically per DOD spec.



Create filters for precise automatic "Trash Empties" & erasures.

Trash Warnings. Similar to the trash warnings given by the Finder. The warnings apply only to the selection. Hold down the option key to skip trash warnings if this option is not set. An "Empty All Immediately" feature will delete a file upon dragging it onto the trash. All of which makes TrashMaster a very handy utility. The ability to securely delete confidential files is a valuable feature.

TRASHMASTER
BAK2504 TrashMaster ... \$59.95
Runs on any Mac requires System 7.

Reports
Secret Doc
Source

The Hierarchical Empty.
Delete exactly the files you want — when you want it done!

Aliases.h
Finder.h

THE SHARP WIZARD MISUNDERSTANDING!

REVIEWER'S NOTEBOOK: It all started a couple of years ago. From sharp minds came the fabulous little organizer that had the potential to change the way busy people take care of their information. It offered all the power and functionality of the Mac — in a fast, capable little package about the size of an ordinary checkbook. It offered an extra wide 40 character by 8 line screen for a wider view, a QWERTY typewriter-style keyboard, up to 128K of memory, "one-button access" to any of its built-in features, the ability to run spreadsheets, compatibility with IBM and Macintosh desktop computers, a slew of personal organizational tools — all running on standard CR-2032 batteries.

But everyone thought it was just an electronic notepad. That's like saying the Stealth bomber is just an airplane. The fact is, The Wizard is a serious business machine. Sure, it's a great place to put all of your "gotta-have-it-now" information; phone numbers, addresses, appointments, expenses and strokes of brilliance — and a built-in word processor — but that's just the beginning.

Designed to Do What Your PowerBook Can't. The Wizards from Sharp are sophisticated, powerful computers designed specifically to organize all of your personal information. Whether you're jotting down names, numbers and expenses or creating 3-D charts and downloading spreadsheets. Its power has been allocated to fast, easy collection, storage and retrieval of anything. The Sharp Wizard delivers the ultimate in portability.

The Wizard focuses on the fundamentals. Like an extra wide, super-crisp screen which allows an impressive 40 character by 8 line view. The display is the single most important feature in any small computer, and nothing I've seen compares to The Wizard. I love the way each key is exactly where you'd expect it to be. Search with one stroke, perform any task by just touching an icon. The Wizard's keyboard is tight and responsive; the keys are crafted from superior materials.

Hold it in your hand — you'll see and feel the attention to precise detail. The Wizard is deceptively light and superbly balanced, with a mar-resistant case that can handle life on the road.

I've been using a Wizard OZ-8200 for a number of months now, and I can tell you that it fills a big need in my business life. I used to carry a Macintosh Portable and quickly realized that I spent too much time babysitting the thing, along with all of my programs, files and diskettes. What I needed is something much smaller and lighter, yet fast and powerful. I carry my Portable sometimes — but my Wizard is always with me. Unlike my Portable, which requires booting-up, opening a word processor or note pad, the Wizard requires just one key-stroke and is ready to receive my thoughts.

With the software now available for the Wizard, I can run spreadsheets, create finished documents, organize my ex-

penses, communicate with my desktop back at the office or my Mac at home — even send faxes and play a few furious rounds of Hatris or Box Jockey! I've also quit carrying my pocket tape recorder to record ideas and memos — the Wizard does it better.

When you think about it, a Portable is often overkill for road trips — what you need on the road is a small, fast, convenient machine designed to gather information now. The Wizard is the perfect answer, providing all the functionality of a Mac with an optional spreadsheet, memo pad and other amazing organizational tools. Just touch an icon and the Wizard is ready to go! The Wizards feature huge (40 character by 8 line), super-crisp screens, solid QWERTY keyboards, full compatibility with your desktop Macintosh or PC — and with the new OZ-8200, you'll pack 128K of memory!

The Wizard does so much more. The real news is that the OZ-8200 128K Wizard is in stock and ready to ship. With this powerhouse in your briefcase, you're ready to do just about everything you do on your desktop Mac or PC. And the Wizard's sleek design makes it the perfect traveling companion (unlike the excess baggage of a laptop or notebook). It's about the size of a checkbook, weighs almost nothing and runs on standard CR-2032 batteries.

The misunderstanding continues. Pop in the Wizard Money Planner software card and your Wizard becomes a powerful (and full featured) financial calculator. The North American City Guide includes over 12,000 detailed entries about 23 cities: New York, Miami, San Francisco, Toronto, Montreal, Los Angeles, Atlanta and more. The 8-language translator helps you with words and word phrases in several categories: air travel, sightseeing, hotels, restaurants and more. The spreadsheet software is 1-2-3 file compatible and the thesaurus/dictionary contains over 42,000 words and 500,000 synonyms. Oh, and by the way, if you get a free moment, slip in Tetris, Hatris, Box Jockey or Backgammon for some fast-paced fun!

An Organizer for Every Career. Three models are available: The 7000 Organizer Series, The 5000 Organizer Series and the incredibly powerful 8000 Wizards. Each is packed with built-in features, great looking screens, and expandability to a fax, a modem — even to your Mac or PC. With an Organizer or Wizard you're never alone. You get performance without all the little inconveniences.

Organizer Accessories. There's an optional modem, printer, fax and a slew of software cards that turn the Wizard into a fully functioning office, so you can conduct business anywhere. With the Mac Link cable, you can download information from your Mac to your Wizard and have up-to-the-second information when you take it on the road. There are several models to choose from, one for your style of business. It's flexible.

Expand The Sharp's Mind. When you add software and memory cards to your Wizard (7000 & 8000 series only), you put all kinds of possibilities at your fingertips. Memory and applications simply slide under the touch-sensitive screen which acts as a keypad to perform tasks, open applications, and more.

Time Expense Manager. The powerful way to manage and prioritize your schedule, track your ex-

penses and deadlines, and account for time spent on projects or client meetings.



Spreadsheet. Create fully functional, Lotus 1-2-3 file compatible 26-column-by-999-row spreadsheets on your Wizard, or download a spreadsheet from your Mac! The card will hold 64K of data! Built-in features include: 10 templates, complete formatting, sorting and "freezing pane" functions, math and financial calculations, spreadsheet-linking capabilities, cut & paste and more.

Money Planner. Turn your Wizard into a featured, highly powerful financial calculator. Loan interest rates, depreciation and statistical analysis — or program your own equations! Change one value and all affected values automatically change.

North American City Guide. Includes over 12,000 detailed entries from 23 North American cities: New York, Los Angeles, Chicago, San Francisco, Atlanta, Montreal, and more.

The Organizer Bible. Contains both New and Old Testaments from the King James version Holy Bible. Instantly go to any Book, Chapter or Verse.

8-Language Translator. Translate words and commonly used phrases in English, Chinese, French, German, Japanese, Italian, Swedish and Spanish.

Tetris, Hatris, Box Jockey, Backgammon. From the Soviet Union comes Tetris. The all new Hatris where you must position falling hats on top of each other. And Box Jockey challenges you with over 13 mazes — each one more difficult.

Thesaurus Dictionary. Over 42,000 definitions, 500,000 synonyms, and an 87,000 Spelling Corrector. Can even be used with any of the Wizard's built-in modes.

Something for Nothing! Buy a Wizard OZ-7200, OZ-8000 or OZ-8200 and get a handsome Leather Case and Video Guide FREE! (a \$69.98 value). Buy any 2 software cards — get 1 software card FREE (must be of equal or lesser value!).

**BUY THE OZ-7200 SHARP WIZARD—
GET MAC ORGANIZER LINK
AT 50% OFF!**

SHARP WIZARD

BAK6310 ZO-5200 Sharp Wizard	\$199.95
BAK6311 OZ-7200 Sharp Wizard	\$239.95
BAK6312 OZ-8000 Sharp Wizard	\$299.95
BAK6309 OZ-8200 Sharp Wizard 128KB	\$399.95
BAK6313 Organizer Modem	\$179.95
BAK6314 Organizer Talk (OZ-7000 series only)	\$99.95
BAK6315 Organizer Fax/Modem	\$499.95
BAK6320 Time Expense Manager	\$119.95
BAK6321 Dictionary/Thesaurus	\$129.95
BAK6322 8 Language Translator	\$99.95
BAK6323 Money Planner	\$99.95
BAK6324 Spreadsheet II	\$179.95
BAK6325 Scientific Computer Card (7000 series)	\$109.95
BAK6317 Scientific Computer Card II	\$109.95
BAK6326 North American City Guide	\$79.95
BAK6330 Box Jockey	\$49.95
BAK6331 Organizer Chess	\$109.95
BAK6332 Tetris Game (7000 series only)	\$49.95
BAK6318 Hatris Game (8000 series only)	\$49.95
BAK6319 Backgammon Game (7000/8000 series)	\$49.95
BAK6333 Organizer Bible	\$149.95
BAK6340 Portfolio Card	\$129.95
BAK6341 32K RAM Card	\$79.95
BAK6342 64K RAM Card	\$129.95
BAK6345 128K RAM Card (7200/8000/8200)	\$149.95
BAK6346 Mac Organizer Link	\$109.95
BAK6347 IBM Organizer Link II	\$129.95
BAK6350 Leather Case (OZ-7000 series) (Reg. \$34.99)	FREE w/OZ-7200
BAK6351 Leather Case (OZ-8000 series) (Reg. \$34.99)	FREE w/OZ-8000 or 8200
BAK6399 Video Guide (Reg. \$34.99)	CALL
BAK6352 Battery Pack (for OZ-8000 series)	\$34.95
BAK6353 Printer	\$169.95
BAK6354 Dubbing Cable	\$29.95



Pictured: The Sharp 8000

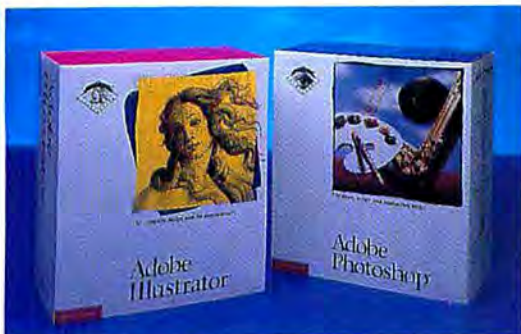
Draw, Paint, Retouch. Make Digital Movies!

REVIEWER'S NOTEBOOK: In addition to the two industry standards reviewed on this page: Adobe Illustrator and Adobe Photoshop, TigerSoftware is proud to be among the first to offer Adobe Premiere, an incredible new title that allows you to combine video footage, audio, animation, still images and graphics to produce digital movies on your Mac. Uses Apple's QuickTime media-integration technology, so multi-unit production hardware isn't required. Adobe Premiere is fast, fun and yields high-quality results. Interactive presentations, television ad concepts and roughs, video databases, merchandising sequences and training sessions are just a few of the wide-ranging uses for this hot new title.

ADOBE ILLUSTRATOR: A slew of impressive industry awards grace the Illustrator box, a clue to the amazing capabilities you'll discover inside. Indeed, Adobe Illustrator is the most powerful drawing, page design and production tool in the world today, ideal for designers with a desire to elevate their work to a new vista of speed and creativity. It's the only system capable of precise illustrations, extensive text handling, fully automatic graphing and color separations. You can work from existing images if you like — just scan it and you're ready to begin. Or draw from scratch using Illustrator's magnificent set of drawing tools, the envy of the industry. It's as simple as moving the mouse.

Professional pages depend on the ability to handle text in a variety of ways. (This package includes free Adobe Type Manager and 13 type faces). Nothing allows more creative opportunities than Adobe Illustrator when it comes to integrating text with your designs, illustrations, line art, images and photos. Just enter your text on screen, or quickly import it from your word processor. Then take control of the kerning, tracking, word and letter spacing.

Create tight wraps around shapes (or any path, like circular type) and images, viewing your alterations on your screen as you work. Flow text from one column to the next, add unlimited numbers of characters and styles from any PostScript Type 1 font (including the entire Adobe Type Library). You can even convert the type to outline images, then create images from them.



Creating charts is a snap with Illustrator. Just type in your data, select a chart type and it's done. Customize your charts with your palette of creativity and revise them in seconds. You'll create top-notch ads, brochures and more, from concept to final production and color separations. In fact, the Adobe Illustrator box was completely created using the product. Color capabilities include smooth 24-bit screen reproduction (8-bit is supported for B&W).

ADOBE PHOTOSHOP: The ultimate color-retouching/image processing system for the Mac. A great pre-press and production tool, Adobe Photoshop has garnered loyal users in all areas of graphic design and color reproduction. Using its extensive features, it's able to create anything you can imagine. Full 32-bit color artwork with full control and flexibility to manipulate and combine photographic images, and the ability to create stunning video effects. Color separations are precise, meeting or exceeding even the strictest standards for reproduction. You can produce bitmapped, grayscale or continuous-tone color; add color, change it or remove it completely. Produce intriguing duotones, tritones and quadtones. And you can use your existing Adobe Illustrator files in your Photoshop images. You've got a great selection of creative tools right at your fingertips.

When you've finished your creative frenzy, Photoshop switches instantly to production mode, allowing full PANTONE color matching, automatic trapping and full CMYK editing for true four-color process proofing. Scan your photographs on any scanner — from low end black and white to high end drums. A host of controls and image filters enhance your creativity and the powerful paint tools are unparalleled.

ALL NEW! ADOBE PREMIERE... Become a movie maker — with the help of your Mac — and new Adobe Premiere. It's the newest creative tool from the leaders in precision graphics and photo manipulation. It's fast, easy and fun to use — just gather your clips and arrange them in the order you want them to play and Premiere handles the rest with blazing speed.

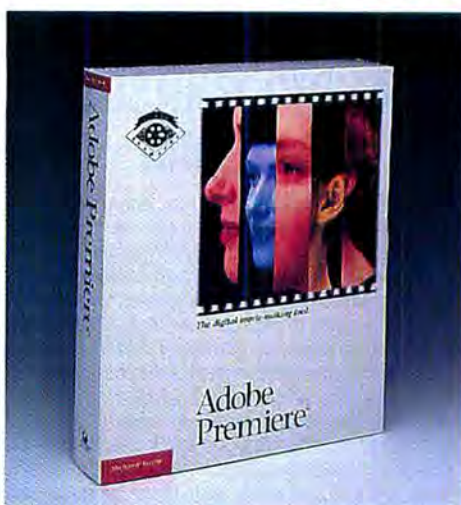
Premiere utilizes the Apple QuickTime extensions to store and import your video and audio files. You can arrange your clips to appear in progression with simple cuts, or overlap them to create dramatic transitions like dissolves, page turns and spins. You can isolate areas of your moving video or still images and superimpose them onto other clips to create a wide range of special effects that will grab your audience like nothing else they've ever seen.

You can use plug-in filters (including Adobe Photoshop-compatible filters) to produce tints, distortions and replications. Using Apple's QuickTime extensions, you get the enormous capabilities of true media integration — and now, you can produce digital movies at an affordable price, for a variety of uses.

And with QuickTime, you can store video footage and accompanying audio on an ordinary disk drive. Copy clips over and over without distortion or loss of quality.

Premiere acts as the control room for your movie studio. From its intuitive interface, you'll see the tracks of your movie in "filmstrip" style. And if you need to make a change, multiple windows provide you with fast access to any editing function. Want to add an effect? Just click any one of the animated icons to select great digital effects. The video windows on your screen also enable a quick preview of source material, digital effects and assembled video. There's even a Timeline display with zoom-in and single-frame viewing. Quickly check your sequences with Premiere's push-button controls, move to any clip instantly. Click to rewind, play, fast forward, record and single-stop, slow-, or fast-motion. As you work, on-screen indicators display time, frame counts, audio levels and storage requirements.

Premiere is packed with special effects. Like transitions (graphic effects used when changing from



one scene to another), choose from a band slide or band wipe, checkerboard, barn doors, cross dissolve, funnel, dither dissolve, iris round, page turn, radial wipe, spiral boxes, roll ways and more — it's like having a state-of-the-art television editing suite right on your desktop! And you'll also get a set of digital image-processing filters that work with just a click to improve contrast, balance colors and help with image correction. Choose from a selection of special effects filters such as: posterization, radial blur, twirl,



Create magnificent video databases...

flip, mosaic, zigzag, replicate and wave. You can also use "plug-in" effects. Adding sound is easy. Premiere automatically synchronizes the audio and video using cue points. Once you select and capture your video and images using QuickTime, lay down your audio narration and effects — you're ready to assemble your final product. Premiere allows you to combine 2 separate video tracks, 1 special effects tracks, an overlay track and 3 stereo audio tracks. Just select and drag segments from any input track during assembly. That's all there is to it! The storyboard-style editing eliminates the need for list management, and your movies are limited only by disk space. The built-in matte generator provides selectable colors, backgrounds and borders.

ADOBE		7
BAK2501 Adobe Photoshop	\$555.00	
BAK2502 Adobe Illustrator	\$375.00	
BAK2503 Adobe Premiere	\$325.00	
Adobe Illustrator: Macintosh II, LC or SE product line, Plus or Classic with a hard disk; at least 2 MB of RAM using System 6.0.5 or greater or 4 MB of RAM using System 7. Adobe Photoshop: Macintosh II product line or SE product line with at least 2 MB of RAM; System 6.0.4 or later and a hard disk. Adobe Premiere: Macintosh II family computer; 4 MB RAM; high-capacity hard drive (80 MB or more recommended); System 6.0.7 or greater; QuickTime v1.0 or greater; 32-bit QuickDraw v1.2 or greater. Shipping charges billed actual cost.		

Create Full 3-D, Photorealistic Images!

REVIEWER'S NOTEBOOK: *MacRenderMan* and *Showplace* (bundled together in this offer) represent the finest software available for 3-D image creation, viewing and manipulation. *MacRenderMan* allows you to create incredibly realistic images, while *Showplace* allows you to import those images and create scenes, with complete control of lighting, texture, backgrounds, vantage points and dozens of other effects. Altogether amazing, surprisingly easy and fast. In fact, *RenderMan* was used in creating the academy award winning film, *Tin Toy*. Impressive results can be achieved in a short time, but if you get the urge, you can get crazy with these products and never be seen or heard from again...

MacRenderMan. Fascinating photorealistic design made easy (and fun). Three distinct dimensions in full color, with a variety of surface textures and designs. In our first session, we created several billiard balls with a variety of whacked-out designs and colors in under an hour. That hour passed quickly; most of the real work was handled by *MacRenderMan* transparently.

We began the modeling process by describing the objects (geometry and appearance), the characteristics of the lighting (the light sources) and the view we wanted of the object (the camera, if you will). We then had a scene! We could change the texture of the surface (and how the light reflects off of it) and easily control the various shading techniques. The more you work on your images, exploring the powerful capabilities of *MacRenderMan*, the more detailed your images become. This is a great tool for CAD projects, product design, animation, merchandising, architecture and presentation graphics. Nothing else can compare to the images you'll create with *MacRenderMan*, the most visually accurate picture making product available for the Mac today.

MacRenderMan is used with 3-D design applications that produce *RenderMan* Interface ByteStream (RIB™) files. Use your favorite 3-D design system to shape objects. The design software will record these geometric descriptions into a RIB file and spool the file. *MacRenderMan* reads the spooled RIB file and produces a color rendition, computing it in the background under *MultiFinder*.

The MacRenderMan Software Package. *MacRenderMan* is a package of applications designed to bridge the gap between modelers and renderers on the Macintosh. *MacRenderMan* includes:

- **RenderMonitor.** Similar to the *PrintMonitor* desktop application available under *MultiFinder*, *RenderMonitor* allows you to render images in the background, so you can continue with other functions while it works.
- **Chooser.** The standard Macintosh Chooser desk accessory allows you to select a renderer from among those that are available, and to set up renderer options for each one.
- **PhotoRealistic RenderMan.**

Renderer. The *MacRenderMan* package includes Pixar's high-quality renderer, known as *PhotoRealistic RenderMan* (or *PhotoRMan*), as the renderer of choice for most applications. This is the default renderer selected by the *Chooser*.

- **Vector RenderMan Renderer.** A second renderer, known as the *Vector RenderMan* (or *VectRMan*), is also included with the *MacRenderMan* package to generate wireframe images as quick approximations for more detailed renderings.
- **Example libraries and demos.** Example libraries of RIB files, shaders, and texture maps are provided. A sample modeling application called the "Pencil Demo" is also included to illustrate the use of shaders on different parts of a simple model.



Give images 3-D beauty and realism.

Showplace. *Showplace* is the forum for your objects created with *MacRenderMan* technology. Build a dazzling 3-D scene by quickly importing and arranging *MacRenderMan* images, or choose from the library of Pixar *ClipObjects*, including furniture, lamps, a sleek racing bicycle, billboard, shopping bag, a theater spotlight and more. Then turn your camera loose and move around your scene to create spectacular effects and perceive a multiplicity of angles.

Change the "look" of an object by changing its surface: you could have an oak grain table and a stucco-painted wall, or a stucco-painted table and an oak grain wall, or an oak grain shopping bag and brushed chrome walls! With *Showplace*, you can decide the appearance of an object independently of its shape. *Showplace's* ability to combine any object with any appearance (including those you create) is one of its most powerful features.

These "Looks" include: bricks, brushed chrome, gold and copper, concrete, gray and rose granite, veined marble, natural oak, plastic and sky patterns, among others. Manipulate characteristics such as shininess, size, roughness and reflectivity. It's your own world of synthetic reality! Then take a TIFF or PICT image and wrap it around any 3-D object in your scene to create dramatic effects, impossible in 2-D graphics programs.

Using *Showplace*, you could create a slide presentation that features *MacRenderMan* images in a variety of shocking, interesting, unusual and impossible ways. Like messages on balloons and billboards, in the pages of books and emblazoned on the surface of a table. You can add fog, smoke and atmospheric conditions to your scenes, adjust the lighting and create masterful shadow detail.

The Four Showplace Elements.

There are four elements, or "things you can manipulate" in the *Showplace* world. Each element has its own toolbox and a corresponding menu.

- **Objects.** An object is a collection of one or more surfaces. They are the main elements of the scene. An object might be created in some modeling application, or installed as part of a *ClipObject* library. In either case, the



Magnificent pictures, life-like shadows...

object can be imported into a *Showplace* scene and resized, rotated, or moved.

- **Surfaces.** A surface is part of an object that can take on a single appearance. A *Look* can be attached to a surface to give it a certain appearance in the final image. For example, it could be transparent glass, wood grain or metal.

- **Light Sources.** The definition and placement of light sources in a scene is essential to its look in the final image. Shadows, the appearance of spectacular highlights on surfaces, and the illumination of different areas of the scene are all determined by lights.

- **Cameras.** Everything you see in the *Showplace* world, and thus everything that will appear in your final image, is seen through the lens of a camera. You can set up several cameras at various locations to give you different vantage points from which to view the scene. You can move these cameras, save their locations, and choose which to use at will.

Showplace comes complete with a videotape that walks you through the production of a scene in detail. We found that the videotape alone was enough to get us going with *Showplace*, all the functionality is explained in a simple, straight forward manner. Although *Showplace* is a lot of fun just to play with, you'll soon discover how you can work the intriguing scenes into your presentations and on-screen demos.

These fine products transcend any paint or draw programs you've ever used, employing technology seen only in high-end design and animation studios. The images will certainly stop an audience! If you need a presentation that's a cut above, nothing will deliver the impact like *Showplace*.

ALSO AVAILABLE IN CD-ROM VERSION

MacRenderMan and *Showplace* applications, complete online documentation for both products, a gallery of images created with Pixar products and a sample of Pixar animation all on one CD-ROM!



MACRENDERMAN & SHOWPLACE

BAK2410 *Showplace & MacRenderMan* Bundle \$635.00
BAK2411 *Showplace & MacRenderMan* CD .. \$435.95
Showplace: runs on any Macintosh II family computer with a floating point coprocessor, 32-bit QuickDraw, *MultiFinder* and at least 5 megabytes of internal RAM (8 is recommended); color display system (for full-color viewing, 24-bit is recommended). *MacRenderMan:* Macintosh II, IIx, IIcx or IIcx running *System* tools 6.0.3 or higher; *MultiFinder* and 32-bit QuickDraw installed; 5 MB of disk storage; 8- or 24-bit color display system; 5 MB of memory (8 MB recommended); *RenderMan* compatible design package.

The Finest Removable Hard Drives Made.

REVIEWER'S NOTEBOOK: Highly acclaimed, 100% reliable and backed by a solid warranty, the PLI line of removable cartridge drives is the most respected in the industry. When your files and applications grow to monumental size, when you want to perform fast backups or when you want to take heavy megabytes on the road, nothing gives you the unlimited capabilities of the PLI Infinity 40 and 88mb drives. The PLI Cartridges carry a full 5-year warranty. Includes PLI's famous TurboWare utilities. One other note: The PLI drives and cartridges are thoroughly tested, far exceeding industry standards, so when you install a PLI, you're ready to go — with uninterrupted performance.

With much of the design and layout work done at TigerSoftware on Macs, our PLI cartridge drives are critical to a smooth operation. Without their reliable service and unmatched speed, getting our hands on files would be nearly impossible. Our choice: the PLI Infinity 88 Turbo drive. This remarkable instrument carries a 60,000 hour MTBF rating. It features the highest level of filtration, quality-engineered circuitry and is virtually impossible to damage by incorrect cartridge insertion (one of the leading causes of drive failure).



Designed and engineered for rugged use, the PLI Infinity 88 Turbo has the industry's highest tolerance to non-operating shock (our 88 Turbo once survived a four-foot fall onto a tile floor). The 88 Turbo also includes PLI's TurboCache, a disk drive accelerator program that dramatically increases the speed of all of your SCSI drives. TurboCache uses system memory to create the cache, boosting data throughput by a whopping 50% for many applications. Of course, you'll get all the features that have made PLI the name asked for most when it comes to removable cartridge drives including external switches for termination and SCSI address, UL-approved, individually tested power supplies, long-life 50-pin Centronics SCSI connectors, an external fuse and (unlike other drives) you get the complete kit, with all necessary cables and accessories. The Infinity 88 Turbo beats Bernoulli hands down when it comes to price, performance and value.



Another PLI advantage: your Infinity removable

cartridge drive comes complete with useful, easy-to-use software hand-picked by the experts at the renowned Berkeley Macintosh User's Group — over 15 megabytes! It also includes PLI's own TurboCache and TurboOptimizer software, with a combined retail value of \$200.00. These tools add to the performance and flexibility of your Infinity 88 Turbo system. And only PLI provides them.

PLI conducts 24-hour drive burn in, component level testing, self-diagnostic routines and a slew of other tests, many of which are proprietary to PLI.

PLI DRIVES & CARTRIDGES

BAK2460A Infinity 88mb Removable Single External Drive	\$845.00
BAK2460B Infinity 40mb Removable Single External Drive	\$645.00
BAK2465A 88mb Cartridge (Uniform, 1-yr. war) ..	\$139.00
BAK2465B 44mb Cartridge (Uniform, 1-yr. war) ..	\$69.00
BAK2465C 88mb Cartridge (Format, 5-yr. war) ..	\$149.00
BAK2465D 44mb Cartridge (Format, 5-yr. war) ..	\$109.00

Get Your Priorities Straight!

REVIEWER'S NOTEBOOK: First Things First is an innovative new time manager that doesn't require hours of laborious setup to be incredibly useful — it's incredibly useful right out of the box. A unique Floating DeskClock Icon stays "on top" regardless of how crazy your desktop gets. Runs under System 7 in addition to System 6. Extremely fast. Non-obtrusive, with 30 action/task categories. There's even a built-in demo program for you to copy freely and share with other Mac users. We can't really manage time — it flows on relentlessly — but we can do something about our priorities!

Perfect timing. It's either the result of incredible luck or determined effort. In business, however, you can't always depend on luck. That's where First Things First comes in. The premise is that even the most organized people have trouble keeping track of all the things they must (and want to) accomplish.

Sound familiar? Time-dependent tasks, appointments and deadlines simply don't care if you have enough time to organize them. And unless a time manager is fast and easy, it is of little use. First Things First is extremely easy to use, delivering instant access to your list of tasks and details. It allows you to organize your efforts by category or project, and keeps you in touch with the big picture even in the wake of interruptions, crises and priority shifts.

You'll quickly create categories, establish reminders and things to do, view your lists, print your lists and have almost unlimited capabilities to customize First Things First to fit your personal style. That's important.

I was at first intrigued with the Floating DeskClock. It gives you the time and date in either expanded digital or analog form. There's a little "tear-off" calendar that helps you manage your schedule, review priorities and reminders. It's very cute, but also very powerful and can be moved wherever you like, reduced to just time or time and date.



Priority Power!

- **Setting Priority when creating New Things To Do.** Now you can easily set one of four priority levels by simply clicking on 1 through 4 when creating a new item.
- **To Do Items listed with priority number.** To Do items are listed in the main dialog box and are preceded with a priority level number (1-4) positioned in a 3-D box.
- **View by Priority — a whole new dimension of power!** A fourth pop-up menu at the top of the main dialog box lets you view Things To Do by Priority Level (Priority One only, Priority 1-2, 1-3 and 1-4) as well as by Category and Timeline.
- **Priority One splash window to stay focused!** Anytime you want, you can do an Option/Click on

the clock and have First Things First pop up a window that only includes your Priority One items for today! This is an incredibly powerful way to stay focused on the most important things to do!



Customizable Time Range. New Version 2.0 offers you the ability to customize the time range of the tasks and reminders to be viewed. Easily call up a dialog box to input the start and stop date.

Import/Export — Great for Mac Portables. Version 2.0 offers flexible options for converting personal information data from other programs into First Things First and exporting to text formats or to update other First Things First data files. This makes it ideal for Mac Portable users who want to be sure they have the most recent task and scheduling information on both their portable and desktop Macs!

MUG News Service, the internationally syndicated information resource for 2000 Macintosh user groups worldwide, has selected First Things First as Utility of the Year.

VISIONARY SOFTWARE

BAK2403 First Things First 2.0	\$49.00
Any Macintosh with at least 1mb of RAM and System 6.0.4 or later.	



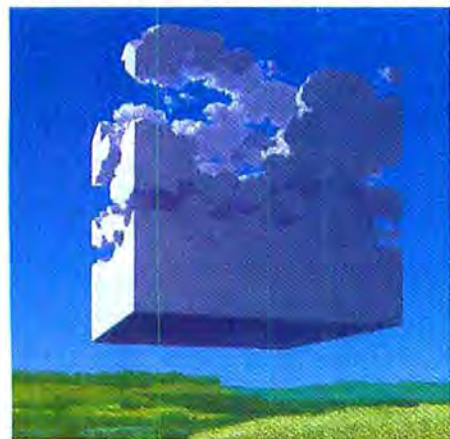
Hot Studio Color!

The Finest Graphics Cards, Color Displays, Digital Video Capture and Pro Paint Software... SuperMac is the source for color.

REVIEWER'S NOTEBOOK: In this article, we review the entire line of SuperMac professional graphics tools for the Mac. Professional, because they combine to create the most comprehensive system. Capable of ultra high-quality graphic work — while keeping an eye on the budget. We're particularly impressed with PixelPaint Professional, the most designer-oriented paint product we've seen, with a highly intuitive interface. The most useful set of paint and image manipulation tools round out its toolbox, which gives you complete flexibility and control. Take a step beyond reality with PixelPaint Professional's effects. We'll also review the Spectrum series of color-blasting graphics cards and award-winning video displays.

PixelPaint Professional: High-powered, graphics-oriented tools for the advanced user. Version 2.0 includes a broad array of paint capabilities along with extensive photo manipulation and enhancement features. Open dozens of individual windows and cut/paste images and elements between them, streamlining the design process. Move quickly to create new layouts — PixelPaint Professional can keep up with your fertile imagination! The tools are magnificent; create shapes, fine-tune location and boundaries. The brush and paint tools allow instantaneous changes in line width, angle adjustment, Bezier curves and scaling the overall size. Quick zooms give you precise image control, clone artwork with the advanced rubber stamp, define the colors you want—to create just the exact picture you had in mind.

The color features are unsurpassed, ideal for design. PixelPaint Professional's trademark is the ability to manipulate and enhance color — including the industry's most exact color blend and fill. Go beyond



simply blending two colors. You can define multiple color definitions within the blend for previously impossible color effects. And you can create seamless color gradients with PixelPaint Professional's breakthrough Macintosh color control. Produce roughs of original concepts, tight comps and refine designs —

right up to prepress. From scanned photographs and illustrations to the creation of beautiful originals, PixelPaint Professional provides all the tools you'll ever need. And you won't believe the results.

Features and Benefits:

Familiar Interface: Utilizes powerful paint tools in an intuitive manner, minimizing the learning curve and enabling productive work immediately.

Multiple documents: Work with as many images as you like. Autocroll through images up to 4K by 4K in size — up to 300 dpi.

Wet Paint Shapes: Reposition a figure or test after you have drawn it for creative flexibility.

Merge Function and Buffers: Combine other artwork files or create a montage of scanned photos in your work.

Transparency Control and Advanced Anti-Aliasing Control: Powerful painting features control paint opacity to create photorealistic images. Anti-aliasing eliminates the "jaggies," creating smoother shapes and sharper text.

Powerful Masking: Built-in "masking tape" gives ultimate control over painting techniques. True 8-bit support for semi-transparent masks during the entire process — not just for photo composition.

Intuitive Color Mixing: Mix colors on screen as traditional artists mix paint for unlimited color possibilities. Create gradients exactly as you want them.

Image Processing Effects: Color correct photos or adjust contrast and balance. You may also emboss, mosaic, posterize, tint, and more.

Color Selector: Choose colors with a method you're familiar with: PANTONE® MATCHING SYSTEM, RGB, HSV, Color Theory, Process Color (CMYK) enable the user to work with industry-standard color specifications.

Prepress Printing: Four-color or spot color separations enable the user to print high-quality output to devices such as the Linotronic 300. Supports PostScript and Color QuickDraw output to a wide variety of devices.

SuperMac VideoSpigot and VideoSpigot Pro: VideoSpigot and VideoSpigot Pro are SuperMac's digital-video grabbers, for use with Apple's QuickTime in making incredible animated sequences and Mac movies. It's fast and easy, great for a variety of in-house productions. VideoSpigot Pro gives you the ability to use large-screen display images with breathtaking results. Using these precision crafted boards (and accompanying software) turns your Mac into a soundstage, ready to capture vivid full-motion video — all fully digitized. Capture live video by quickly connecting to a VCR, laserdisc or video camera. Even if you've never put a video production together, VideoSpigot puts you in the director's chair. The VideoSpigot Pro contains greater speed and delivers 24-bit color on 12" and 13" displays. It's the graphics power tool for the hot design shop. Call us for more information on the VideoSpigot and new VideoSpigot Pro.

The SuperMac 19" SuperMatch Display: A new standard for designers and production use. The super performer, complete with color-matching capabilities, breaks technological ground with an extended color range and the accuracy of a natural white point (a neutral point that determines other colors) for true, WYSIWYG color reproduction. Added realism with richer reds and deeper greens than any other display, based on European Broadcast Union (EBU)

standard phosphor technology. Bright, sharp images all the way to the corners! Flicker-free, great with complex and full-page graphics. Infinite control of brightness and contrast.



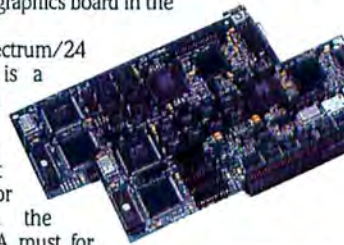
The 19" SuperMatch Display.

An exceptional value; hundreds of dollars less than Sony and other manufacturer.

The SuperMac 19" Platinum Series: Four times the display area of a standard Macintosh, the 19" Platinum is ideal for the exacting needs of business documents and gray-scale publications. Pinpoint-precise image accuracy and screen reproduction, includes flicker-free technology, white-point phosphor reference and OCLI antialias filter. NO fuzziness, no blurs — you'll always see razor-sharp images on the Platinum from SuperMac. Reasonably priced, engineered for reliable performance.

THE COLOR ITSELF: The SuperMac line of graphics cards explodes with rich, brilliant color — bringing 100% display accuracy to any project. The Spectrum Series has a board for every Mac and delivers spectacular results for artists, designers and illustrators. There are three 8-bit boards to choose from, the fastest you've ever seen; three 8•24-bit speed demons and a 24-bit monster that's the envy of the industry. The Spectrum/8•24 PDQ (and Spectrum/8•24 PDQ si) deliver more speed and flexibility than Apple's 8•24GC card, with a much smaller price tag (along with the longest warranty in the business). It's workstation-graphics performance at an average of 30% less cost. The Spectrum/8•24 series contains a small microprocessor on board that achieves the maximum possible speed for frequently used graphics routines in applications like Adobe Illustrator, Photoshop, QuarkXPress and Aldus FreeHand. And The Spectrum/8•24 supports more displays from more manufacturers than any other card: Apple Color, Apple Portrait, Radius and RasterOps. This is the hottest graphics board in the business.

The Spectrum/24 Series III is a legend in color technology, kicking out great color throughout the spectrum. A must for the serious designer, perfect for color prepress work.



SuperMac Graphics Cards	
BAK2475A Monochrome	\$395.95
BAK2475B Spectrum/8 si	\$795.95
BAK2475C Spectrum/8 LC	\$795.95
BAK2475D Spectrum/8 Series III	\$795.95
BAK2475E Spectrum/8 24 PDQ	\$1095.00
BAK2475F Spectrum/8 24 PDQ si	\$1095.00
BAK2475G Spectrum/24 Series III	\$2395.00
SuperMac Graphics Displays	
BAK2476A 19" Platinum Display	\$1095.00
BAK2476B 19" SuperMatch Color Display	\$2095.00
SuperMac Digital Video	
BAK2478A VideoSpigot si	\$395.00
BAK2478B VideoSpigot LC	\$395.00
SuperMac Pixel Paint Software	
BAK2477 PixelPaint Professional	\$495.00
BAK2479 PixelPaint (Regular)	\$155.00
<small>Requires System 6.0.5 (6.0.7 for VideoSpigot) or later with 2 MB or more of RAM, a hard disk with at least 3 MB of free space, an 8, 16, 24, or 32 bit video card, and a color or grayscale monitor.</small>	

Enhance And Modify Your Fonts With Amazing Results!

REVIEWER'S NOTEBOOK: Now anyone can get typographic-quality effects and enhancements using their existing type, with FontMonger, the super fast, simple-to-use type customizer. Modify a wide range of your type's characteristics, including the ability to merge individual characters to create custom faces. Modify existing typefaces into all small caps and use characters you've never been able to access before.

This easy-to-use utility can save you hundreds (or even thousands) of dollars by converting PostScript Type 1 (for use in Adobe Type Manager) and Type 3 fonts to the advanced new TrueType format.

Here's another fascinating FontMonger capability: you can actually merge characters from several font families, to create unique small caps, composite characters, customized faces and logotypes.



Combine typefaces, remap keyboard characters or convert between type formats.

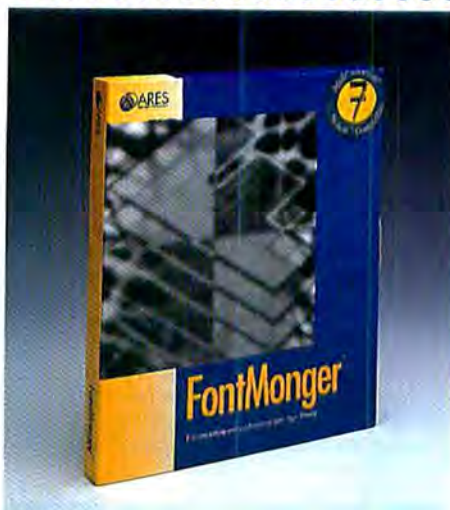
FontMonger also offers support of Adobe Illustrator and Aldus Freehand files. You can create or modify characters within programs and build these modified characters back into a font. It's fast, easy and very handy when using multiple programs. FontMonger's type modification tools provide a vast assortment of intriguing capabilities including: access to unencoded characters, creation of oblique characters, generation of superscript and subscript characters along with generation of slash and bar fractions (some of which have been previously hidden, others you probably never knew you had).

Using FontMonger, you can convert fonts one face at a time, as you need them, or in batches so your entire library is at your service. Just one step converts the batch. In addition, you can control the character widths of your fonts (the space between characters) the horizontal and vertical scaling, the slant and character width.

Outline Fonts. Outline fonts that describe the lines and curves which make up their characters. They can be used to draw characters at any size on any screen or printer. With the arrival of Adobe Type Manager (ATM) and Apple's System 7.0, you can now use outline fonts throughout your Macintosh system. Fonts you use this way must be in PostScript Type 1 format for ATM, and in TrueType format for System 7.0.

TrueType. The TrueType font format was developed by Apple for System 7.0. The format has been adopted by Microsoft for use with Windows.

Type 1. Before 1990, only Adobe could produce fonts in PostScript Type 1 format, so if you wanted to



use ATM you had to buy Adobe fonts. Now, the Type 1 font specifications are publicly available, and you can buy Type 1 fonts from many vendors.

Type 3. Until the Type 1 format was made public, non-Adobe PostScript fonts were in the less-capable Type 3 format. Type 3 fonts are usually slower to print, produce lower-quality results and do not work with ATM. You may never need to convert any fonts to Type 3 format with FontMonger (although you can). Instead, you will probably want to convert Type 3 fonts to Type 1 and TrueType formats.

ARES FONTMONGER

BAK2415 FontMonger \$59.95
Requires Macintosh Plus or newer; 1 MB of memory; two floppy drives or a hard disk; System 6.0.2 or later.

Advanced Grayscale Image Enhancement And Manipulation.

REVIEWER'S NOTEBOOK: If you've got a scanner, this product is for you. A professional-quality image manipulation product with scores of tools, filters, masks, retouching features and more. Supports TIFF, PICT and EPS. Features a customizable tool palette, advanced magnification features and input/output device calibration for best-possible reproduction. It is a true second-generation grayscale image enhancer, so you have complete control of your scanned images, not just two or three options. Create images that you simply couldn't before—clean, crisp halftones from imperfect originals. Grab just parts of a photograph, create a montage, filter images for reproduction with higher quality than you've ever seen before. In use today by graphic designers, scientists, publishers and professional retouchers. Magnificent anti-aliasing tools to eliminate jagged edges and uneven tones.



Images can be scaled, rotated, resampled, aligned, cropped, cloned, flipped, stretched, slanted, distorted and displayed in a variety of perspectives. A few moments of experimentation with the Enhance filter set will be an engaging experience. Create line images from photos, clean up blurry originals, posterize and emboss images, equalize images for perfectly even grayscales. There are simply endless numbers of combined effects.

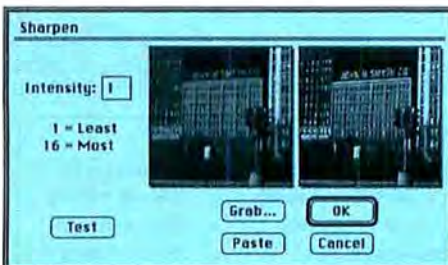
The manual is excellent, providing a quick education on the construction of photographic images, how to scan them for top-notch results and how to quickly calibrate your scanner and output device to make the most of their abilities. You'll learn about the nature of grayscale, how it can be manipulated and improved. The difference between halftoning and dithering, and when to use each in your work. Using Enhance, you can create your own images, or manipulate any existing image created on a scanner, video digitizer, or virtually any other source.

When you get serious about your newsletters, advertisements and other desktop publications, Enhance is the only tool for the job of manipulating second generation images. Nothing else we've ever seen at any price delivers more professional tools (with the ease of use and speed required to make them truly useful) for putting photos on paper. Enhance's toolbox is fully customizable. And, although Enhance was designed to provide the ultimate in black and white image enhancement. No other grayscale image system even comes close.

Using these tools, there are an infinite number of modifications available for any given photo. Blur, sharpen, brush, dropper, edge detection, smudge,

masking and more. You can work with any portion of a photo, retouching just the foreground subject or just the background. Eliminate objects, deepen contrast, posterize just a portion of the photo and eliminate unwanted shadows — even lighten shadows.

Create dithered images or convert scanned dithered images to gray scale or vice versa. Create surrealistic effects by combining blurred or smudged backgrounds with razor-sharp foreground images. The toolbox functions are familiar to those in your paint program, but include far-reaching capabilities that provide unlimited effects. The feathering feature allows you to create soft-edged images and the Fringe option allows you to create spectacular borders.



ENHANCE

BAK2447 ENHANCE \$235.00
Macintosh SE/30, LC or Macintosh II family of computers with 2 MB RAM; 8 bit color video card with gray scale or color monitor recommended.

The Best Way to Improve Your Writing.

REVIEWER'S NOTEBOOK: One of the more popular categories in software is the grammar checker, arguably the most important word processing add-in. With today's business climate, poorly written correspondence is separating success and failure. RightWriter's depth and attention to the details of written communication makes it the premier grammar checker for the Mac. Conclusive testing has established RightWriter as the most accurate, most flexible and easiest to use over any of its competitors.

Improve Your Writing by Checking Grammar, Style, Punctuation, and More. In business, you're judged by what you say — and by how you write. Nothing can kill the confidence of a prospective customer or client faster than a proposal littered with grammatical, usage and punctuation errors.

The fact is, there's no excuse for sloppy, error-filled written communication. Each letter, report, proposal, press release or other business document you prepare should represent you as a professional.

RightWriter 3.1 is designed to flag errors in your writing from a rule base of over 4,500 — including rules of grammar, style, usage, punctuation, sentence structure, subject-verb agreement and more. RightWriter produces a copy of the document and performs its analysis. Then displays (or prints) your document with flagged errors and explanations. These explanations are your guide to better writing.

Good Writing Is Good Business. Good writing can mean profit for your organization, satisfaction for your customers, and advancement for your career.

A well-written sales letter or proposal can make the difference between a successful sale and a lost opportunity.

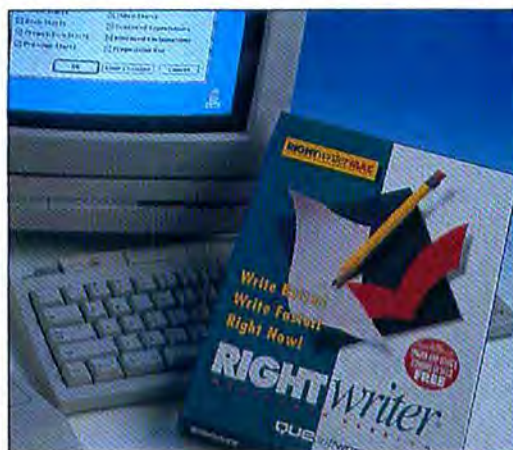
Clear, easy to read manuals result in customer satisfaction and lower support costs. Good writing helps you get your best ideas across.

RightWriter works with your word processor to help you make your business writing strong, clear and to the point. Not a spelling checker — RightWriter is a sophisticated expert system that applies the rules of good writing directly to your documents.

To use RightWriter, create a document with your word processor. Then run RightWriter on the document using a few simple mouse selections.

RightWriter inserts comments into your document pointing out problems in style, word usage, grammar, and punctuation. Use your word processor to make the changes you consider appropriate. Then tell RightWriter to remove its comments. The result — strong, clear business writing.

RightWriter produces a copy of the document and performs its analysis. Then displays (or prints) your document with flagged errors and explanations.

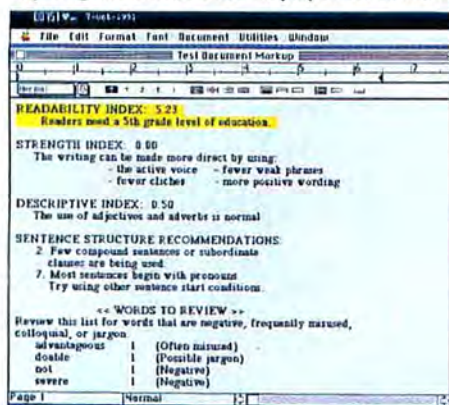


These explanations are your guide to better writing. The result: clear, crisp documents that deliver your ideas with maximum impact.

Change Writing Styles. RightWriter is primarily an aid for Business and Technical Writing. The RightWriter rules are based on the mistakes commonly made by business professionals when writing letters, memos and reports. Since many of these rules are common to all types of writing, RightWriter is also useful for other applications.

Additionally, RightWriter allows you to select the type of writing before analyzing a document. By making this selection, you actually change the rules RightWriter uses for the analysis.

The standards for business writing differ in several important ways from those for fiction. Where business writing should be concise, fiction must often set the scene. Also, good fiction writers create their own style and use literary license. With fiction selected as the type of writing, RightWriter can find many common problems in fiction writing, without imposing the stricter rules employed for business



A Detailed Summary: Along with specific recommendations about your writing, RightWriter provides information about the document's overall strength and clarity. These comments are your guide to better writing.

writing. The types of writing you can select include: general business, technical reports and articles, proposals, manuals and fiction.

RightWriter also provides an option to change the word dictionary. This is especially useful for technical, legal, medical and other types of writing with specialized vocabularies. For advanced users, there are even options to turn specific rules on or off.

How RightWriter Knows When Your Writing is Wrong. RightWriter proofreads your documents using two artificial intelligence (AI) technologies called parsing and expert systems. Each technology has a separate, unique function, but together they rely on one another to identify parts of sentences and to locate errors.

Parsing performs the critical function of sentence dissection. It first identifies sentences' individual parts, breaking each sentence into major phrases and looking for both dependent and independent clauses. Parsing goes further by identifying the subject and predicate of each clause and noting the word's part of speech. This technology, for example, can tell the difference between "can" used as a noun and as a verb.

The expert system relies on the parser to break down sentences so it can determine their accuracy. RightWriter's expert system examines your writing, judges the accuracy, and suggests improvements without your making any specific query.

The Compatible Grammar Checker. RightWriter for the Mac is fully compatible with any document from: MacWrite® version 2.2 through 5.0; MacWrite II version 1.0 and 1.1; Microsoft® Word version 3.0 and 4.0; WordPerfect version 1.0 through 1.0.4; WriteNow™ version 1.0, 2.0 and 2.2... or any other standard ASCII editor.

Simply analyze your document and RightWriter automatically creates a marked-up copy of the document — complete with inserted corrections and comments.

From your own familiar word processor, open the marked-up copy and review the suggestions. Make the changes you want, then let RightWriter remove all the extra corrections and comments.

What's left is a clean copy of grammatically correct, effective communication.

Over 4,500 Rules, Including:

Grammar Rules

- Noun-Verb Mismatch
- Sentence Fragment
- Run-On Sentence
- Misused Verb
- Misused Pronoun
- Misused Article
- Wrong Verb Form
- Misused Word
- Possessive Use
- Is This Correct?
- Repeated Word
- Capitalization

- Overused Phrases
- Single Word Quote
- Contraction

Usage Rules

- Colloquial & Slang
- Archaic
- Sexist
- Legalese
- Computer Terms
- Vague
- Wordy
- Redundant
- Questionable Word
- Not A Word
- Offensive
- Rephrase
- Modified Absolute
- Misleading Euphemism
- Negative
- User Flag

Style Rules

- Passive Voice
- Split Infinitive
- Long Sentence
- Sentence Length
- Difficult Sentence
- Use Verb Form
- Long Paragraph
- Start With But
- Conjunction Start
- Weak Sentence Start
- End With Preposition
- Negative Sentence
- Use Simpler Terms
- Use Simpler Word
- Consider Omitting
- Ambiguous Wording
- Cliche

Punctuation Rules

- Missing Question Mark
- Unnecessary Comma
- Missing Comma
- Misused Semicolon
- Misused Quotes
- Reversed Punctuation
- Unbalanced Quote
- Unbalanced Bracket
- Unbalanced Parenthesis

BONUS!

Strunk & White's The Elements of Style Electronic Edition

INCLUDED FREE WHEN YOU BUY RIGHTWRITER FOR THE MAC!

Reviewers have called it "...the best book of its kind" and raved, "The work remains unparalleled, direct, correct and delightful." Now *The Elements of Style* is available on diskette for your Mac.

Get RightWriter & Elements of Style **\$99.95 value**
\$59.95 value

Both Just \$29.90!

RIGHTWRITER MAC 3.1

BAK3366 RightWriter Mac ... **\$29.90**
Requires 512K and any Macintosh computer, 800K 3 1/4" diskette drive, System 3.2 and Finder 5.3 or later.

Grammar Rules	
<input checked="" type="checkbox"/> Noun Verb Mismatch	<input checked="" type="checkbox"/> Wrong Verb Form
<input checked="" type="checkbox"/> Sentence Fragment	<input checked="" type="checkbox"/> Misused Word
<input checked="" type="checkbox"/> Run-On Sentence	<input checked="" type="checkbox"/> Possessive Use
<input checked="" type="checkbox"/> Misused Verb	<input checked="" type="checkbox"/> Is This Correct?
<input checked="" type="checkbox"/> Misused Pronoun	<input checked="" type="checkbox"/> Repeated Word
<input checked="" type="checkbox"/> Misused Article	<input checked="" type="checkbox"/> Capitalization

Turn on/off specific rules to suit your particular style.

Take Your Information With You!

REVIEWER'S NOTEBOOK: *Dynodex — The Real Contacts Database is an incredibly full-featured address book database manager. Includes both application and desk accessory versions. Allows you to print address books for virtually all popular-format personal organizers (including Filofax®, Franklin®, Time/Design®, Day Runner® and the ever-popular Day-Timer®). You can also create custom designs and sizes for whatever purpose you can imagine. Dynodex's data entry screen is well organized, fast and gives you 22 fields (all user-renamable).*

Dynodex is a true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information — and allows you to print perfect double-sided address book pages that fit virtually any manufacturer's books.

You'll never lose your address book (that could be a disaster!) because you'll always have a backup right

on your computer. Instantly look up and dial any number you need from the powerful Dynodex database — or the convenient desk accessory. Never waste another minute looking up a name or dialing a wrong number. Dynodex gets you the information you need fast.

The powerful Dynodex database delivers ultra high speed searches: instantly select subsets based on multi-level queries with a set of eight logical and arithmetic operators; for example, "all clients in California contacted within the last 6 months." On sorting: you get 3-key, ascending or descending on any field, along with Dynodex's speedy find, change and global delete. You can delete duplicates, Fast-Find and display any record instantly by simply clicking on it in the list window.

If your information resides elsewhere, Dynodex allows you to quickly import it for immediate use. Any text file, tab-delimited or comma-delimited file is ready to use, and Dynodex includes a free copy of DynoStack, for importing HyperCard, Focal Point and QuickDex address files.

On to Dynodex's powerful (and very smart) printing capabilities: You can print any size address page, even double-sided pages. Print in any font, size and style on a field-by-field basis for great looking pages. You can set Dynodex to break pages on a new letter of the alphabet or print continuous listings. Dynodex also prints beautiful pages on DynoPaper, specially designed micro-perfed paper available in a variety of colors and punched-hole configurations to

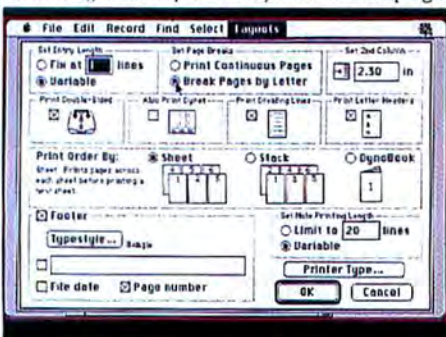
fit your favorite personal organizer. You can use Dynodex to print envelopes, postcards, Rolodex® cards, mailing labels and Post Net bar codes, too.



ALSO AVAILABLE: DynoPage and DynoPaper. DynoPage is the incredibly useful utility that actually allows you to preview and print ANY Macintosh file on any size page, single- or double-sided. Create a center-stapled booklet from any file, or print reports, maps, charts, spreadsheets or other documents to DynoPaper sheets that fit perfectly into your Day-Timer or other personal organizer.

PORTFOLIO SYSTEMS

BAK2440 Dynodex	\$72.00
BAK2441 DynoPage	\$72.00
BAK2442 DynoPaper	\$14.00
(white, cream, gray or yellow)	
Macintosh Plus, SE series, II series, or Portable; System 6.0.3 or later.	



The Industry's Only Continuous Hard Disk Backup.

REVIEWER'S NOTEBOOK: *Ordinary backup systems make periodic backups of your data to a tape or floppy, and that's fine; but DiskTwin offers you automatic, continuous backup protection (great for workgroup servers, transparent while AppleShare runs). That means up-to-the-minute data backups (from primary disk to secondary disk) without any effort at all. Just install DiskTwin and never worry about it again. Another important advantage: DiskTwin features Automatic Cutover, which keeps your Mac on-line during a system crash, seamlessly switching you to the second drive. DiskTwin has the ability to rebuild bad blocks at up to 85mb/per minute. And with DiskTwin's parallel SCSI buses, you don't suffer any performance loss! DiskTwin was awarded an honorable mention as storage product of the year in the MacUser Eddy awards. It also received four-and-a-half mice in their November issue.*

You can avoid the most horrifying scenes with an ounce of prevention. It's called DiskTwin, and it could save your life in the event of... well, the unspeakable. Available either as a NuBus card or SE/30 version (and accompanying software), DiskTwin gives you a constantly updated backup, so there's no data loss between backups. It is automatic and completely transparent, so you'll never forget to use it. It is also AppleShare® compatible so it doesn't slow down your AppleShare users, and it preserves access privileges. And

since DiskTwin uses any standard Macintosh SCSI drive, there's no reformatting or need to update drivers. In short, DiskTwin is a simple, powerful backup system for the Mac.

The automatic cutover feature actually keeps your computer running — right through a disk failure — without any loss of data! DiskTwin simply moves you to the twin disk, you (and your workgroup) continue to work without interruption. The failed disk can be repaired or replaced at any time. The speedy restore function takes control of the recovery process in the event of a primary disk failure, rebuilding data with lightning speed. Once it restores the data and your disk is operational, DiskTwin returns to its continuous backup duties. All DiskTwin error messages can sent via e-mail.

On servers, DiskTwin is the great protector, keeping them on-line through even the most serious interruptions. DiskTwin's mail notification is ideal for unattended or "headless" servers. And DiskTwin doesn't require server shutdown to archive continuously or for archival backup. It's compatible with all file sharing, e-mail, database and other workgroup software.

DiskTwin Scenario — AppleShare/E-Mail Server. Acme Widgets uses an SE/30 AppleShare server with an 80mb internal hard disk for a customer database and QuickMail. How can Acme's network administrator protect her company from losing all of its customer records when a disk

crashes and eliminate downtime from a busy workday?

The DiskTwin Solution. Using DiskTwin with a removable cartridge drive, the administrator can keep both an archive of the entire 80mb server disk and an up-to-the-minute backup. Every evening, she removes the twin cartridge for safekeeping and replaces it with another. By exchanging cartridges daily, the administrator has both continuous server backup and an archive that's immediately usable, unlike a tape or floppy backup.

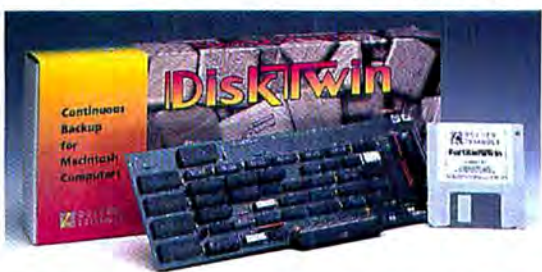
If Acme's server disk crashes, DiskTwin automatically cuts over and continues operation from the cartridge disk, preventing downtime and the loss of the day's work. Users continue working uninterrupted, unaffected by the disk crash. DiskTwin's QuickMail Notification sends an e-mail to the administrator and other designated users, warning them that a disk has failed. The crashed disk can be repaired or replaced at a convenient time.

Twint. Twint is the software only version of its illustrious bigger brother, DiskTwin. It provides the same fully automatic, continuous-backup abilities for individual users and compact servers. Since no hardware is required, it runs beautifully on all Mac versions. It also works with all SCSI disks, with no reformatting or disk driver replacement necessary. Twint also allows

you to create archives, using removable cartridges or erasable optical disks. These archives are ready-to-use.

DiskMaker: New From The Makers Of DiskTwin. If you own a SCSI disk, why settle for the lightweight software that the manufacturer usually provides? DiskMaker is the universal SCSI disk formatter that works with any SCSI disk, so if you have different types of disks, you won't have to scramble to learn the different software. And DiskMaker lets you do more — much more. It features full System 7 support, with 32-bit addressing and virtual memory support.

"A godsend for network managers concerned about downtime."
MacWorld Magazine



GOLDEN TRIANGLE

BAK2430 DiskTwin	\$695.00
BAK2431 Twint	\$105.00
BAK2432 DiskMaker	\$65.00
DiskTwin: Macintosh SE/30 or II series but Apple NuBus or PDS adapters required for IIx; System 6.0.4 or later; SCSI twin disk; no minimum memory requirement. Twint and DiskMaker: Macintosh Portable, Plus, SE series, or II series; System 6.0.4 or later; SCSI twin disk (Twint only); no minimum memory requirement.	

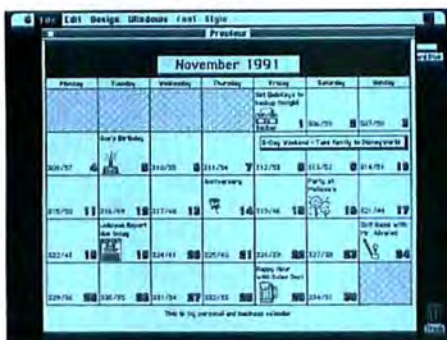
Complete E-Mail Solution for Mac, DOS and OS/2 Networks

REVIEWER'S NOTEBOOK: You can't beat this package for a total E-Mail problem-solver. Everything you need to send messages, voice recordings and more between Macs, DOS and OS/2 computers comes in this one box. This all-new version of the popular QuickMail is so feature-rich, it leaves the competition literally speechless. Plus there's 2 more great applications from the same company: an all-new version of the top-selling QuickKeys, and CalendarMaker. All superb tools for increasing productivity. Plus they're all System 7 compatible.

Whether you communicate across the hall or around the world, QuickMail has the features that make your communications clearer, faster and easier. With QuickMail, the days of missed messages, expensive overnight services and a desk filled with "While-You-Were-Out" slips are over. Also gone are the days of PCs and Macs coexisting — but not communicating. QuickMail connects users on AppleTalk, NetWare, Banyan, 3Com, LAN Manager and other PC networks without buying five different packages. Everything you need to get users communicating and exchanging files is included.

Macros Made Easy! Squeeze 10 keystrokes and mouse movements into a single click. Do backups to another computer in the middle of the night. Automatically check your mail every hour. All this and much more is yours with QuickKeys 2 — the leading time-saver for every Mac.

Since its release, QuickKeys 2 has been highly regarded by the press, user groups and Mac users everywhere. Now, QuickKeys 2.1 is here and it's Sys-



tem 7 savvy. For starters, QuickKeys 2 is like an autopilot for your Mac. Record anything you do and create a macro to play back later. Press a key. Click a button. Close a window. Open a document. Anything you can do on the keyboard or on the screen — recorded and saved in a macro. Then you play it all back with the touch of a single key. Think of all the repetitive tasks you do and you'll see how this can save you time and make you more productive.

CalendarMaker. Everybody uses calendars. We use them to remind ourselves and others of "who, what, why, where and when". Now there's an easy and effective way to have not only a full-featured calendar on your Mac, but also to print beautiful full-page calendars complete with artwork!

You'll work faster and be more organized with this handy calendar/scheduler right at your fingertips. Enter daily schedules and notes. Assign picture-

icons to specific days for visual reminders. Import schedules from other applications like SideKick and MORE. Create "floating notes" that cover several days (like 3-day weekends!). Everything to make calendars for years into the future.

FREE Bonus! IconMover lets you draw, capture or edit any icon. Use these icons in CalendarMaker for customized visual reminders. Includes 288 icons ready to use!



CE SOFTWARE

BAK2490A QuickMail (1-5 users).....	\$265.00
BAK2490B QuickMail (1-10 users).....	\$395.00
BAK2492 QuickKeys.....	\$95.00
BAK2491 CalendarMaker.....	\$39.95
<i>QuickMail: Mac SE or better running System 6.0.5 or later. QuickKeys 2: Mac Plus or better running System 6.0.4 or later and hard disk. CalendarMaker: Mac 512E or better running system 4.2 or later.</i>	

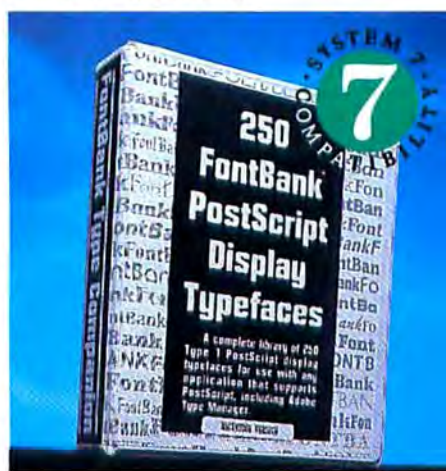
PostScript Fonts For Just 40 Cents Each?

REVIEWER'S NOTEBOOK: What's wrong here? Was that a typo in the headline or has TigerSoftware lost their minds? No typo. No mind loss. Just a great value on a complete (and we mean complete!) library of 250 Type 1 (the best) display faces for use with any application that supports PostScript (including ATM). You already know the value of great looking type in your documents. Now great type costs less. These faces can be used with more than 4,000 Macintosh applications and run beautifully with all Macs. Includes screen fonts as well as printer fonts. Why pay more for foundry-quality type?

Type 1 PostScript fonts — the best you can buy. Smooth and crisp on the screen and on the page. The standard for Macintosh and adopted by Microsoft for Windows. Buy them from Adobe and pay through the nose. Or, take advantage of FontBank's staggering array of quality fonts at down-to-earth prices. You'll create attention grabbing documents and eye stabbing graphic elements for any graphics programs and desktop publishers. With such a wide variety of faces available to you, creating incredible headlines is fast, fun and amazingly professional. The headline is the face of good advertisements. Wimpy headlines are usually ignored, while bold headlines attract the reader, and if your message is important, the casual reader becomes curious — and persuaded. Remember, though, that headlines must be legible. If you'd like to know more about working with display

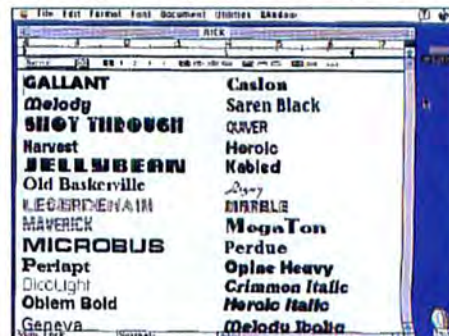
faces and creating winning headlines, call TigerSoftware and ask for a free copy of a 24-page book that we've prepared entitled "A Short Course On Working With Type." It has been prepared by the typographers at Tiger and we'd be happy to get one in the mail to you.

FontBank has assembled a vast array of looks and feels in their type library. 250 different faces, each with its own distinct character. Some you may never have seen before. And FontBank display faces can be easily manipulated with programs like TypeStyle, Adobe Illustrator, Aldus FreeHand and others. Combining FontBank's 250 faces with the capabilities of these programs offers the opportunity for an unlimited number of special effects. And FontBank display faces are compatible with all major page layout applications like Quark XPress, PageMaker, DesignStudio, Multi-Ad Creator and others.



Regardless of what the design assignment, from flyers, posters, ads, coupons and greeting cards, to presentations, notices, memos and packaging, FontBank display typefaces give you the typographic tools you need to look your creative best. And, when converted to editable outlines using FontMonger, these faces can be used to produce special text and design effects to create stunning documents.

How long have you been using those same tired typefaces? Chances are, you use what you have because finding the right typefaces, installing them, and learning to use them is more trouble than it's worth. So, you compromise the overall look of your document by compromising on the one critical factor: the type. That's why FontBank is such an exciting product, easy to install, a pleasure to use — and a low cost way to improve the quality of everything you print.



Just a sample of the FontBank library of pro-quality Type 1 typefaces. Each is smooth and clean on-screen — and on paper!

FONTBANK

BAK2425 FontBank.....	\$95.00
<i>Can be used with any Macintosh.</i>	

Easier Than PageMaker! New Publish-It! Easy 2.1...



REVIEWER'S NOTEBOOK: If you're about to enter the world of Macintosh desktop publishing, or if you're an experienced user who wants fast, quality results without dredging through hundred-page manuals, Publish-It! Easy is the award-winning, System-7 Savvy product that you've been looking for. Called by MacWorld Magazine "... the Swiss Army Knife of desktop publishers," and awarded 4-and-a-half mice by MacUser, it's the only desktop publisher you'll ever need. Works with amazing swiftness on any Mac and makes eye-grabbing pages in a fraction of the time you'd spend with other products. Also available in the popular new Corporate Network File Server Version. Achieve great results in your first session. Includes 72 sample layouts and QuickStart manual for instant results.

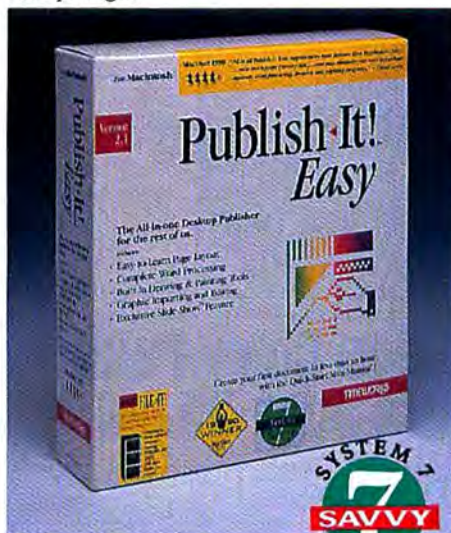
The printed page. It can be an adversary or a joy. If you've got new Publish-It! Easy loaded on your Mac, you'll enjoy the process of laying out a page — and produce handsome newsletters, brochures, catalogs, reports, bulletins, advertisements, flyers, coupons and more! With the toolbox of advanced, easy-to-use features such as The Slide Show (complete with dozens of features and effects, outperforming some stand alone packages!), instant thumbnails (view and edit up to 100 pages), built-in database and mail merge, spell checker and thesaurus, your ideas will look extraordinary on paper as well as on-screen. Draw, paint, edit text, add graphics instantly and use a host of other state-of-the-art publishing tools with sleek controls. In fact, this one program eliminates the need and expense of having separate drawing, painting, word processing mail merge and presentation software — that's how incredibly full featured this package is! And don't worry — Publish-It! Easy doesn't punish you for mistakes or experimentation — it provides 5 levels of Undo to get you right back to the beginning, so you can explore other creative avenues. Print your quality pages on any Chooser-selectable printer.

Unique "What-If" Features. And Publish-It! Easy's unique "What-If" design features makes new and exciting layouts come to life with "Libraries" and "Proxies" that take the mystery and legwork out of the design process. Change type styles or sizes and the text automatically reflows. Headlines instantly fit into the area they're supposed to and subheads tuck cleanly into proper position. Indents are done for you, page numbering and book binding margins are automatically added and more. Publish-It! Easy even handles vertical text justification, aligning text with the top, center or bottom — or any way you like it — with just a mouse click. You can quickly import text from your favorite word processor (including Microsoft Word/Works, WordPerfect, MacWrite I and II, WriteNow and others) — with all type styles and fonts intact! Touch up scanned images with extensive professional tools and import graphics from Adobe Illustrator, MacPaint, SuperPaint, Freehand, FullPaint or any other drawing or painting program with PICT, PICT2, EPS, TIFF or PAINT file formats!

Graphics From Scratch... You can also create your own graphics from scratch with 65 pen sizes, then paint them using an assortment of 32 brush sizes and an airbrush. For typographer-quality text effects, Publish-It! Easy allows you to mix typestyles, sizes and styles in any combination you like — even print grayscale or textured type to create an endless variety of unique effects. Of course, you get precise control of the kerning, leading, stretching, condensing and rotating of your type (in one-degree increments).

Pop in a graphic image, and Publish-It! Easy automatically wraps text around it.

Includes FREE File-It Database... File-It is an incredibly useful database and merge program built right in to Publish-It! Easy. Now you can integrate customized information (names, addresses, phone numbers, personal notes, even entire paragraphs) into form letters you create in Publish-It! Easy. It includes three sample databases, seven professionally designed templates and an assortment of mailing label formats, so all you have to do is drop in your data and create a form letter in seconds! Preview your information before you print and retain all of the desktop publishing features (stylized fonts, rotated type, mixed text and graphics) when you create your customized documents. A powerful database takes care of all the details for you, like math, logical "if-then" functions, multiple sort levels and more. A great accessory to Publish-It! Easy that you won't find in other packages.



Here's how easy it is!

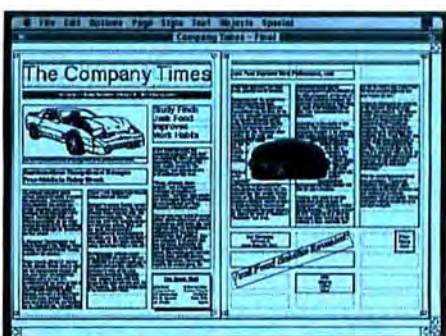
- **Extensive On-Line Help.** An extensive on-line help system guides you through every command, tool and object at the press of a key.
- **Libraries and Proxies.** Experiment with document design all you want. Easy's "Libraries" & Proxies let you alter page layout and type styles instantly — making changes and experimentation easier than ever before.
- **Multiple UNDO Levels.** Lets you UNDO a text mistake you made up to five steps back.
- **Find and Replace.** Instantly change any word or any font, font size or font style throughout your document in a single command.
- **Multiple Windows.** Open, arrange and work on as many documents and windows on your screen as memory permits.
- **Thumbnail Editing.** View and edit up to 100 pages at a time in thumbnail view. You can quickly move elements from one page to another.
- **Layout Aids.** On-screen, movable pica, metric and inch rulers, and a customized alignment grid help to layout your document.
- **Dynamic Time, Date & Page Number Stamps.** Automatically update as you modify your document.
- **Service Bureau Checklist.** Provides all the essential information for service bureaus, such as

font list, document size, file statistics, etc.

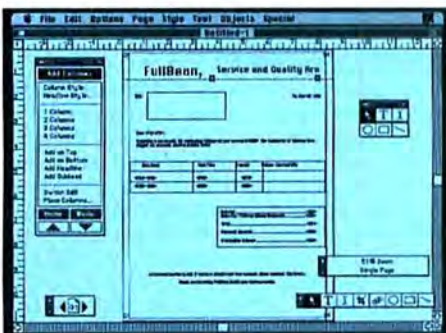
Here's how powerful it is!

- **Full-Featured Word Processing.** You can type, spell-check, and format your documents right from within Easy.
- **Dynamic Text Flow.** Watch your text automatically being reformatted as you change the size, shape or location of your text frames.
- **Converts Apple II Word Processor files and Graphic files.** For importing into Easy.
- **Slide Show™.** Create and prepare slides, handouts or on-screen presentations. Works in Auto-Repeat or Manual Mode — with your choice of 49 transitions (special effects between slides). Easy has all the tools you need to transform your documents into presentations.
- **Spot Color Separations.** Define up to six spot colors and apply them to your text or graphics. Then print them out as spot color separations.
- **Zoom Palettes.** Palettes drop out of sight to give you the maximum working area.

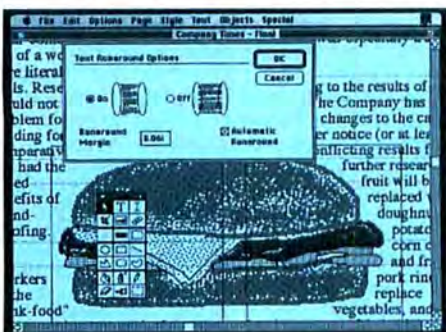
Also Available! Corporate Network Version!



Page layout fast and easy, with a palette of powerful tools. You can easily view double-page spreads.



Add columns and headlines with sleek menus.



Zoom in or out to adjust details.

TIMETWORKS

BAK2470 Publish-It! Easy \$135.95
Any Macintosh running System 6.0 or later with 1MB RAM.



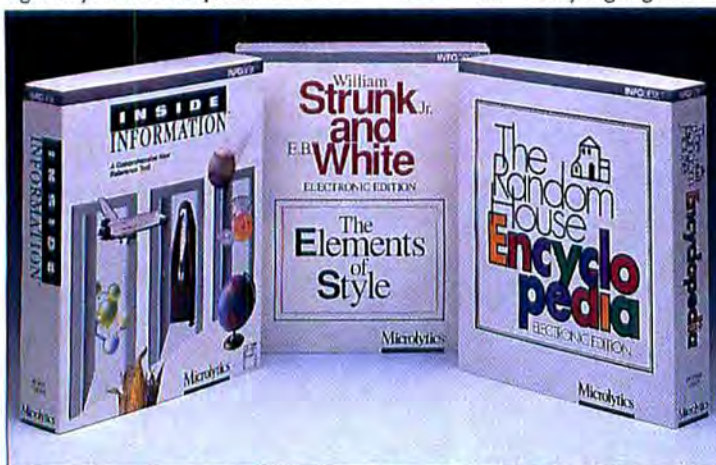
A World of Information on Your Desktop!

REVIEWER'S NOTEBOOK: The INFODESK series is an important milestone in reference software. Three classic works are now available for the Macintosh. Each contains a wealth of current information, arranged for easy location and accessed through the powerful INFODESK engine. You'll use these titles often. They're fun to just browse through!

Random House Encyclopedia. The best-selling encyclopedia that puts a full-blown reference center right on your Mac! Simple and fun to use — without

a CD-ROM player. Ideal for students, professionals, researchers, writers and makes a wonderful gift for anyone. Just click to explore History, Geography, Philosophy/Religion/Mythology, Social Sciences, the Arts, Science, Sports and Leisure, Law, Government and more.

Using the powerful, built-in search and retrieval tools, you can see a quick overview of Chinese history, the advent of computers, facts about Romanian agriculture or learn how a nuclear power plant works. Click on Sports and learn about Ty Cobb, Hank Aaron and the immortal Babe Ruth. Click on Science and travel back to July 20, 1969 and Neil Armstrong's historic moon walk. Click on Arts and Music and Instruments to travel through the careers of Elvis, the Beatles and others. Click on Government and explore the lives of George Washington, Thomas Jefferson, JFK and others. It's fast, easy and fun — ready to go right out of the box.



Inside Information. This new Desk Accessory is a comprehensive reference tool which organizes the English language into logical Categories of defined words. Far more than a dictionary or thesaurus, INSIDE INFORMATION lets you quickly and easily explore any of seven general Classes: Nature, Science & Technology, Domestic Life, Institutions,

Arts & Entertainment, Language, and The Human Condition. These Classes contain 20 Subclasses, 125 Categories, and 700 Subcategories.

Categories are defined by subject matter, such as Chemistry, Law or Music — or by a common property, such as Colors, Tools, Verbs of Motion — or even a specific usage, like Insults, Slurs & Epithets.

Dig deeper into each Class in three different ways: outline view, graphic view or tree view. The reverse dictionary lets you type a few descriptive words, then see a listing of appropriate terms and definitions.

Strunk & White's Elements of Style. Reviewers have called it "...the best of its kind" and raved, "The work remains unparalleled, direct, correct and delightful!" Now **The Elements of Style** is available for your Apple Macintosh or IBM PC compatible computer.

Based on an original work by William Strunk, Jr., a Professor of English at Cornell University, this updated third edition, prepared by noted writer and grammarian E.B. White, has become a classic of conciseness. It's the ideal tool to make your writing crisp, succinct and powerfully effective.

Anyone who needs to communicate effectively in writing will find *The Elements of Style* packed with specific, pertinent examples to improve writing style and structure. It's an easy-to-access educational reference work for the rules and principles of correct English usage. Includes seven rules of usage, eleven principles of composition, several matters of form, a list of often misused words and a style guide.

RANDOM HOUSE

BAK2350 Random House Encyclopedia Mac	\$65.00
BAK2000 Inside Information Mac	\$65.00
BAK2600 Elements of Style Mac	\$59.00

The 32-Bit, 16.8 Million-Color Paint Program That Costs Just \$35.00!

REVIEWER'S NOTEBOOK: It's hard to imagine that a paint program with true 32-bit color and a palette of 16.8 million colors, plus an extensive toolbox of creative features can sell for just \$35.00. But a few minutes with Expert Color Paint and you'll know that it's true. Expert Color Paint brings professional-quality paint and photo preparation down to earth with one of the most feature-rich, easy-to-use products we've ever seen. This one is fast, fun and loaded with all the extras—including System 7 support. Compare Expert Color Paint to MacPaint (at \$125), UltraPaint (at \$199) and SuperPaint 3.0 (\$199). Feature for feature, you simply can't beat this low-cost, high performance art attack! Throw in a free disk packed with quality clip art (a \$24.95 value) and it's the most irresistible offer we've ever made!

Frankly, the high-priced paint products are a little embarrassed. They've been telling customers that a paint system has to be expensive to be good. And while that may have been true in the past, the wall has come down. Expert Color Paint is a powerful, yet simple-to-use product that produces great looking images, just like the pricey packages, and adds a studio-full of advanced toolbox features, such as



lasso and magic wand, gradient tools, dropper, air brush, paint can, a host of patterns and more.

For image editing, there's blur and sharpen, distort, skew, brightness filters, contrast control, image scaling, paint dithering, antialiasing (smoothing), rotate, flip, stretch and slant. There's even a life-saving "multiple undo" feature. You can customize your tools, retouch photos for pro-quality results and create extraordinary gray scale images in no time.

Those other paint programs told us that paint programs should be difficult to use — but that's not true anymore, either. In fact, working with Expert Color Paint's sleek menus and streamlined tools gives you complete control — without the learning curve. Retouching photos is fast and easy. Expert Color Paint is like having a darkroom right on your Mac, with a

host of creative options at your fingertips, more than some full-blown photo-manipulation programs! And incorporating special effects is a snap.

When you're done, save your pictures in one of several popular formats, or easily publish them to other System 7 programs. And Expert Color Paint will use virtual memory, so massive color files (with as many colors as you want) are never a problem.

Although Expert Color Paint is bursting with riveting color, it's also a pro-quality tool for creating impressive black and white images as well. And when you're ready to print, Expert Color Paint provides vast support for ImageWriters, StyleWriters and LaserWriters — even Linotronic and AGFA Compugraphic printers. Sorry, SuperPaint, MacCheese, UltraPaint and MacPaint, Expert Color Paint is more — for less!

✓ Expert Color Paint is a simple yet powerful color paint program with many extras including 32-bit color and image editing.

✓ The fully loaded tool palette includes adjustable Brushes, Magic Wands, Air Brush, Paint Can, Patterns, Text and more.

✓ Includes professional editing features like Blur, Sharpen, Brightness, Contrast, Rotate, Stretch, Slant, Anti-aliasing and Dithering.

✓ Support for QuickDraw and PostScript printers.

✓ Extra Bonus! Clip Art Disk, a \$24.95 value included FREE!

EXPERT COLOR PAINT

BAK2505 Color Paint	\$35.00
Requires Macintosh SE/30, LC, Macintosh II, IIx, IIcx, Classic II, PowerBook 140, PowerBook 170, and Quadra families (68020 processor or above) with 2 MB RAM and a hard disk; System 6.0.5 or later and 32-bit QuickDraw; 8-bit video card recommended.	

Want To Learn A Foreign Language?

REVIEWER'S NOTEBOOK: Learn Spanish, French, German, Japanese, Italian, Chinese or Russian with the foremost language tutoring system in the world: Hyperglot. If you've ever studied a language before (and want a fast, easy way to refresh), need to learn a new language for travel or business, or even if you've never attempted a second language, this series combines the power of your Mac with the most extensive materials available. Digitized voices of native speakers provide pronunciation lessons while grammar, vocabulary and phrases are at your fingertips. Hyperglot also offers the industry's most respected Japanese language software.

Business today is setting its sights on global expansion as European and Asian markets explode. Communication is a critical aspect of success in these new territories. With Hyperglot's series of foreign language software, you can learn to speak and understand languages of the important countries of the world with less effort and almost instantaneous results. If you're a traveler or student, exploring a new language is fast and fun with Hyperglot's digitized speech and logical progression.

Pronunciation Tutor (Available for Spanish, French, German, and Chinese): The Pronunciation Tutor is packed with over 2 megabytes of high-quality, digitized sounds, consonants, words, phrases and full sentences. Just click on the syllables, words and sentences; a native speaker repeats them as many times as you need. The Pronunciation Tutor includes an extensive set of notes throughout the stacks — a great aid to understanding as you move through the lessons to expand what you're seeing on the screen. Just click at any time for more information, clarifications and examples. Unusual sounds, pronunciations and inflections are explained with easy-to-understand notes and digitized sounds are available at any time. And of course, translations are available with a mouse click.



Verb Tutor (Available for Spanish, French, German, and Russian): Hyperglot's series of Verb Tutors include extensive verb drills that provide a thorough understanding of these languages as spoken. 200 sentences, recorded by native speakers, drill you on 20 frequently used verbs. Check conjugations of all tenses of the verb being drilled, see an instant translation, get a quick briefing of the rules for tense usage, check your answers and see a complete explanation. Ideal as a first- or second-year course in any of the featured languages. Also great as a review or meaningful refresher course.

Word Tutor (Available for Spanish, French, German, Russian and Italian): A complete, automated vocabulary drill with up to 1600 words and their translations. You can type the answers to questions

posed by the system or use the speedy flash card format for drills. Word Tutor will automatically re-test you on missed answers and you can create drills of any size you like for self-paced learning. Drill from Spanish, French, German, Italian, or Russian to English or vice versa. (Incidentally, these products are excellent as an aid to English as a second language.) Create your own drills, see the words in random order and create your own customized vocabulary sets.

HYPERGLOT LANGUAGE SOFTWARE

BAK2480S Spanish Pronunciation Tutor	\$35.00
BAK2481S Spanish Verb Tutor	\$39.00
BAK2482S Spanish Word Tutor	\$35.00
BAK2480F French Pronunciation Tutor	\$35.00
BAK2481F French Verb Tutor	\$39.00
BAK2482F French Word Tutor	\$35.00
BAK2480G German Pronunciation Tutor	\$35.00
BAK2481G German Verb Tutor	\$39.00
BAK2482G German Word Tutor	\$35.00
BAK2483A Japanese: KanjiMaster	\$99.00
BAK2483B Japanese: EasyKana	\$69.95
BAK2482I Italian Word Tutor	\$35.00
BAK2484 Russian: Introduction	\$39.95
BAK2484R Russian Word Tutor	\$35.00

Memory requirements vary. Call for details.
Other language teaching aids available.

Screen Glare Is Inconvenient ... And Harmful.

REVIEWER'S NOTEBOOK: The problems related to screen glare go far beyond mere inconvenience. They can affect your performance and enjoyment when using your Mac. They can also cause serious visual problems. The OCLI line of high quality glare guard and anti-glare filters fight eyestrain and block damaging electric field radiation. Many state agencies and municipalities now require such filters on every computer they own. These filters also provide optically correct display, eliminate static, reduce screen "flicker," increase comfort and fit all Mac models, while eliminating up to 99% of offensive glare and harmful ELF/VLF E-field emissions. Along with establishing good lighting conditions, adding a high quality OCLI filter to your display is the most important addition you can make to your system.

You've been there. Three o'clock brings a wicked stripe of light through your office window, blazing squarely across your computer screen. So you rubberneck around your monitor, in useless attempts to see through this hideous glare. Or you swing your computer around, contorting yourself to see as you work.

If you think that there's no connection between those glaring moments and the eyestrain, headaches and blurry vision you experience afterwards, you're wrong. The fact is, glare has a serious and damaging effect on your vision. Studies have proven this in exhaustive testing in recent years. These problems produce a domino-effect on your performance, and can



lead to health problems over prolonged exposure.

Only OCLI Glare/Guard Profile Plus filters, with patented HEA technology provide definitive protection against these potential hazards. Why not use mesh screen or diffusing light filters? You could, but they are far less effective than OCLI's optically coated filters. Mesh screens use a fine mesh to limit the amount of light reflected from the face of the display, causing fuzziness and distracting patterns that reduce image clarity. Diffusing filters have a chemically etched glass or plastic surface that scatters reflected light. They greatly reduce the sharpness of screen images. Only OCLI's coated filters eliminate glare while improving sharpness of image quality.

Ten of the leading mesh, polarizing and coated anti-glare filters were compared for visual effectiveness by researchers at Virginia Polytechnic Institute and State University at Blacksburg, Virginia. The study conclusively determined that the Glare/Guard

optically coated filter provided the best readability of all models tested.

Then there's the issue of monitor emissions, perhaps the most serious of considerations. Only Glare/Guard filters are made of tempered glass, which is virtually unbreakable. Tempered glass is five times stronger than regular (annealed) glass, and two-and-a-half times stronger than safety glass (laminated). If you and your children use a Mac at home, you need the superior protection of the OCLI Profile Plus filter.

What about static? Did you know that static electricity causes an invisible static charge, harmful dust buildup and damaging equipment surges that can ultimately lead to data error or loss? Static charge also has been proven to cause skin rashes. That's why OCLI Glare/Guard Profile Plus filters are grounded, eliminating the menace of static electricity. OCLI HEA (high efficiency antireflection) coatings used on these quality Glare/Guard filters have been adopted for use by NASA on Shuttle orbiters, reducing glare on spacecraft cabin windows, instrumentation panels and computer displays. They're also in use on camera lenses, microscopes, scientific instrumentation and a host of other optical devices that require precisely controlled light.

Many products are labeled as anti-glare filters, but in fact, performance levels vary greatly. OCLI Glare/Guard filters are designed and manufactured to uncompromising quality standards by OCLI (Optical Coating Laboratory, Inc.) — the recognized leader worldwide in the design, development and manufacture of thin film optically coated products.

OCLI GLARE/GUARD FILTERS

BAK2445A Macintosh 9" line	\$65.95
BAK2445B Macintosh 12" (LC)	\$75.95
BAK2445C Macintosh 13" (RGB)	\$75.95
BAK2446 Apple Portrait	\$75.95

The 4,000 Year-Old Game Of Abstract Reasoning.

REVIEWER'S NOTEBOOK: While most of today's popular computer games feature eight-headed dragons, impenetrable Soviet tanks or playful green cosmic blobs, Go is a simplistic Japanese tradition that challenges the mind on the most basic level. It, indeed, mirrors the logic, philosophy and personality of the player, stirring the inner self and demanding intense concentration. Fascinating and addictive, you'll learn to play in minutes and spend the rest of your life mastering it.

Here's how you play Go: Two opponents alternately place black or white stones on the vacant intersections of a 19 by 19 grid-board, attempting to surround empty points and thwarting one another. The player with the most enclosed intersections wins.

Unlike chess, which requires superior technical mastery to defeat an opponent, Go requires players to combine vision and logic. And while both games demand a strategy, decisive attacks and a solid defense, Go allows weaker players to compete evenly with a unique hand-



icapping system.

An interesting characteristic of Go is that the entire board may not look the same as it did on any previous turn. Since you add stones during each turn, there are only rare instances where the board could look the same. And unlike chess, which ends in a draw if the board repeats often enough, Go requires that you do not repeat.

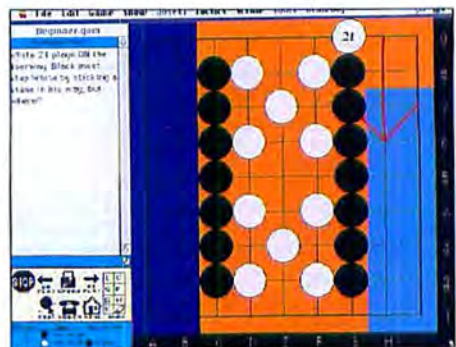
Most Go games have three distinct phases: The opening, in which players establish the areas of the board that they hope to control; the midgame, where players strengthen and extend territories, while attacking the opponent (most games are won in this phase); and the endgame, where players fill neutral points and solidify their positions.

Timing and planning are critical. Players must judge when to create complete boundaries for the territories they've captured or risk being attacked at any time. When to reinforce a territory and when to attack (or defend an attack) is a matter of precise timing. Defending a position too soon will hurt your efforts to expand, while a late defense will allow an opponent to destroy your position with little or no loss. Your strategy will dictate whether to begin your conquest at the corners, on the sides or within the center of the board (HINT: the 3rd and 4th lines from the edge represent the most efficient play).

Once you begin playing Go, you'll understand the intellectual challenge that underlies the simple appearance. It's much deeper than any game you've ever played and much more rewarding than pulverizing a fleet of visitors from another planet!

Go Master Deluxe. Take your Go experience to the limit with the ultimate level of play. Go Master assists your planning with battle maps revealing stones and groups needing defense, territorial control for each player, or even 10 recommended plays. Go Master Deluxe includes Nemesis Joseki Genius and Neme-

sis Tactical Wizard, two grand master tutors that guide you to the peak in Go skills. Joseki gives you sequences of moves culled from centuries of play by the masters. By learning strategies of organized moves, and using Joseki techniques in your play (it aids both players equally), you'll quickly develop skills that will make you a dangerous opponent. Includes on-line introduction on the Joseki theory. Nemesis Tactical Wizard is your advisor as you play, consulting you on what to do in life-and-death confrontations with the enemy. Also includes Nemesis Scribbler, the documentation utility for your Go matches. Complete annotation capabilities for the serious Go student and advancing player.



The ancient Japanese game of Go: Two opponents place their stones on vacant intersections of a 19x19 grid, attempting to surround empty points and thwart one another. This game requires strong strategy and intense concentration. Available as just the game or Go Master Plus, complete with tutorial, time-tested strategies, and a host of sample sequences.

NEMESIS GO MASTER

BAK2406 Go Master \$35.95
BAK2405 Go Master Deluxe \$71.95
Requires 512K RAM; 800K floppy drive; System 6.0.2 or later.

The Ultimate Defense Against Intruders!

REVIEWER'S NOTEBOOK: If you've ever had your computer invaded, your data compromised or your equipment damaged by an unauthorized user, you understand the need for total system security. While passwords provide an inconvenience to unauthorized use, only Kensington's hardware and software concept of system defense delivers total protection to even the most determined offender. Available for Mac Classic, IIc, IIcx, IIfx, II, IIfx, IIsi and SE/SE 30 models. No other system we've ever seen comes close, and if you're serious about your data, you won't settle for anything less.

Consider the value of the data contained on your computer. It could easily be one of your most important assets. Now consider the vulnerability of that data if you don't establish a strict line of defense against unauthorized use of your machine. The results of accidental or intentional damage could throw you into instant crisis. That's why Kensington has developed the only three-tiered defense against such system invasions. It's called PassProof. This hardware and software protection package is far more secure than simple passwords, and unlike dangerous encryption schemes that manipulate data, no information is ever altered in any way. PassProof, while

making your system impenetrable to unauthorized use, stays nicely out of the way when it's time for you to work.

The First Line Defense—Hardware. A heavy-duty disk drive lock features a high quality round key lock that prevents downloading of sensitive files and computer viruses. This first defense lock is attractively designed to match the color and style of your Mac, but stands up to even violent attempts at unauthorized entry. Next, PassProof provides durable security plates, constructed of solid metal, with tamper-proof screws that protect your floppy and SCSI ports. These plates block unauthorized start-up using peripheral devices such as external and CD-ROM drives.

The Second Line Defense—Software. PassProof's

The Third Line Defense—Screen-Locking. PassProof's QuickCover automatically blanks your screen after a specific time. To reactivate the screen, just type your password and you're ready to continue working. You can also quickly set up QuickCover to act as a screen saver only, without requiring a password for reactivation. PassProof also gives you a record of user log-in, with a complete list of all attempts to access your system in addition to a record of other system activities.

The PassProof Components. Everything you need is in the box. Comes with PassProof software disk, one PassProof lock, two keys — with serial tag on a key ring, one floppy port plate, one SCSI port plate, one Mac II case screw, four tamper-proof screws, one custom screwdriver, and a user manual.



easy-to-use software installs in seconds, provides multi-level password protection, and allows for multiple users with unique passwords. Users may be added or deleted at any time, but only the master can authorize the addition or deletion of a password and thereby, a user. The master has complete control of the system.

KENNINGTON SECURITY PRODUCTS

BAK2423A PassProof for Mac SE, SE/30, Mac II-RH Drive \$69.00
BAK2423B PassProof for Mac IIc, IIcx, IIfx, Mac II-LH Drive \$69.00
BAK2423C PassProof for Mac Classic \$69.00
BAK2423D PassProof for Mac IIsi \$69.00
Requires hard drive and System 6.0 or greater.

Compress Files And Folders Up To 98%!

REVIEWER'S NOTEBOOK: *StuffIt Deluxe 2.0 is the latest utility from the mind of famed programmer Raymond Lau, and is already an industry standard in compression and archiving. Many national (CompuServe and GEnie) bulletin board files are "Stuffed" and can be accessed through StuffIt Deluxe. It's faster, easier and more competent than any other compression utility we've tested, and includes a slew of state-of-the-art features: a new intelligent compression option, the ability to create self-UnStuffing archives and automatic launching of compressed application or documents. You'll save some serious disk space, while giving yourself complete file manipulation control, the ability to open multiple windows, move, copy, sort, rename and delete archived files — even add password security! By compressing files, you also save modem transfer time. Put the Magic Menu Extension in your System Folder and watch a new menu appear in the Finder. Now Stuff and UnStuff files and folders from within the Finder. There's even built-in virus protection.*

If you're not using a compression utility, you're leaving valuable disk space on the table. And if you're not using StuffIt Deluxe, you may be missing out on a wide range of helpful tools.

StuffIt Deluxe features a new QuickStuff command that brings up a dialog box — you simply choose the file or folder you want to stuff. StuffIt Deluxe then instantly creates an archive and stuffs your files. QuickUnStuff is just as easy — just select the

files and it's done! There's also a Control Panel file — Magic Menu — that places a menu called Magic in the Finder. Just select the files or folders you want stuffed — right from your desktop, and without opening StuffIt Deluxe! Incidentally, Microsoft Mail and QuickMail users can stuff and send their E-mail files without actually using the E-mail software.

If you're like most users, you'll adopt StuffIt Deluxe as your main backup program. The extensive, Finder-like operation allows you to actually open multiple archives and move files between them. And only StuffIt Deluxe provides an easy-to-use scripting language to automate your archival procedure.

Also From Raymond Lau...

New SHORTCUT. How would you like to put all of the files and folders that you use all the time onto one menu? Now you can — quickly and simply with new SHORTCUT, the ingenious disk management and file/folder navigation utility that appears within every application.

Using SHORTCUT means that you'll never have to conduct all-out searches for files or folders again — just a mouse click finds whatever you need. By placing a pop-up menu in each application's directory dialog box (a.k.a. Open and Save dialogs), SHORTCUT instantly gives you the ability to "Fast Find" lost files and jump between files and folders. And if you're a StuffIt Deluxe user, SHORTCUT gives you transparent access to StuffIt Deluxe archives. These compressed archives appear as regular folders on your disk. Just

double click on a file in an archive and it's instantly decompressed and ready to go!

SHORTCUT is straight forward, simple and powerful. You can create new folders without using the Finder, rename, delete and lock files and folders, quickly see vital information on files, view text and PICT documents from within any application (even if the application doesn't support them!), and more. The powerful Find command allows you to perform searches with blistering speed by just typing any part of the document name or folder name. You can even customize SHORTCUT to your own needs in just seconds from the Control Panel.



STUFFIT and SHORTCUT

BAK2420 StuffIt Deluxe 2.0 \$62.00
BAK2421 SHORTCUT \$45.00
Any Macintosh computer with a hard drive running System 6.0.2 or later with at least 1MB RAM.

The Intelligent Desktop

REVIEWER'S NOTEBOOK: *Although OnCueII contains several individual features (each of which could be standalone products), one in particular caught our eye as an incredible time saver: KeyLauncher. It allows you to launch any application from the keyboard, without opening layers of folders — by simply typing all or part of its name! That one capability can save an incredible amount of time by eliminating time-consuming steps. It's worth the price of OnCueII alone — but there's much more...*

OnCueII satisfies the power-user in us as elegantly as it satisfies our need for easy-to-use utilities that perform as promised and increase productivity. So it's great for anyone. In seconds, you can personalize your menu configuration for maximum speed and efficiency. Just click to open an application, group documents together that will be used for a specific project, return to work on a recently-used document by retrieving a list of up to 100 files you've used, and launching any of them immediately. No other file and application manager gives you this degree of functionality. There's even a cure for the "missing application" message using OnCueII's unique Match-Maker feature. With it, you can launch files that have

missing applications by assigning another application — any one you choose!

OnCueII also provides powerful, easy-to-use tools to help you instantly find seemingly lost files. You can conduct blistering fast

searches by file name, file format (TIFF, PICT, etc.), creator application, dates created or modified, file size or any combination. With this powerful search feature on your side, you'll never misplace another file. Guaranteed. And with OnCueII's amazing file



management capabilities, you'll be able to instantly find, get info, copy, move, delete, and rename files/folders from within any application — and without using the Finder. It doesn't get any more convenient than that.

And there's more! The On Startup feature gives you complete control of the programs that load when you turn on your Mac, like system extensions and control panels. You simply define the priority and groupings and OnCueII takes care of the rest.

All of which makes OnCueII one of the most important new products to come along in years, giving you capabilities you've probably wished for but never thought possible. And we've just scratched the surface of OnCueII's vast potential: it contains ten other time-saving features that users have screamed for. It's one product that does it all.



Instant file management — from within any application!
Find, get info, copy, move, delete, even rename files or folders without using the finder!


ONCUE II

BAK2400 OnCueII \$55.00
Any Macintosh computer running System 6.0.2 or later with at least 1MB RAM.

TI made PostScript® printing affordable.



Now we've made it fast.

Introducing the TI microLaser™ Turbo printers: They race through sophisticated graphics software faster than other printers.  POSTSCRIPT

How do they do it? A RISC-based 8220 board with PostScript software from Adobe® processes information from your computer quicker. So you spend less time waiting for graphic output.

Swift and still affordable, the personal 9ppm microLaser Turbo retails for \$2,349* — a savings of more than \$2,000 on the Apple LaserWriter® II NTX.

The 16ppm XL Turbo goes for \$3,749* and is ideal for an AppleTalk® network. Both feature PostScript Level 2 with 35 scalable fonts. Two of the smallest footprints you'll find. And superior paper handling that includes a 250-sheet paper drawer that slides *inside* the printer.

Dial the number below for the name of your nearest TI dealer. And take a Turbo out for a spin.



1-800-527-3500.


**TEXAS
INSTRUMENTS**

*Suggested retail price — dealer prices may vary. microLaser is a trademark of Texas Instruments Incorporated. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Apple, LaserWriter and AppleTalk are registered trademarks of Apple Computer, Inc.

Circle 313 on reader service card

MACWORLD

THIS MONTH:

New PowerBook Products
DOS Nets for Macs
3.5-inch Removable Drives
Adobe's Document-
Publishing Plans

BY DAN LITTMAN AND TOM MORAN



STEVEN BASATZ

THE \$3999 PERSONAL COLOR-
POINT THERMAL-TRANSFER
PRINTER FROM SEIKO.

Seiko Ships Personal ColorPoint Printer

Seiko Instruments USA has introduced a color thermal-transfer printer that produces a letter-size page at 300 dpi in less than 2 minutes. Called the Personal ColorPoint, the printer accepts paper up to B4 size (8.53 by 11.93 inches). It comes with 1MB of RAM, expandable to 4MB.

Personal ColorPoint lists for \$3999 for the printer only. To work with Macintoshes, it requires a \$599 MacPac adapter kit, which comprises a NuBus adapter board, Color Quick-Draw printer driver, and True-Type fonts. The printer is compatible with IBM PCs and can be adapted to work with Unix workstations. Seiko, 408/922-5800.—T.M.

TREND

New Drivers

An alternative is finally emerging to the dismal formatting and disk-management software that ships with most hard drives. FWB and Optima Technology, which make mass storage devices, have both recently unbundled and begun selling their software; and newcomer Casa Blanca Works is selling Drive7, which is optimized for System 7. Optima's \$495 DiskMount provides such high-end features as mirroring two drives and recovering crashed drives. Optima also plans to unbundle its tape drive software. FWB's \$199.95 Hard Disk Toolkit is a set of seven applications and utilities that allow users to test performance and to edit low-level SCSI parameters that are normally inaccessible. Casa Blanca Works' \$59.95 Drive7 is a low-priced, easy-to-use package that provides partitioning for Macintosh Operating System and A/UX volumes and lets you change your hard drives' icons. Casa Blanca Works, 415/461-2227; Optima Technology, 714/476-0515; FWB, 415/474-8055.—D.L.



PETER HOEY

operators can write add-ons; several add-ons are already in development, including a news wire-service interface and links to SII and Atex mainframe-based publishing systems.

Price depends on configuration. Quark, 303/934-2211.—D.L.

Chokes and Traps

A San Francisco-based desktop publishing consulting firm has produced an animated introductory tutorial on choking and trapping—processes that compensate for the misregistration of different colors of ink that can occur when printing. The tutorial takes apart a poster with an image of the Mona Lisa to briefly explain choking and trapping for spot color and process colors, type, and photographs. \$19 for individuals; bulk orders with a customized logo are available. Pixel Ink Consultants, 415/564-0962.—D.L.

Quark's Publishing System

QUARK IS DEVELOPING A multiuser editorial system for tracking stories through all stages of writing and editing, as well as managing production.

The system will have two components: QuarkDispatch, a database server that Quark is developing in-house; and QuarkCopyDesk, an application

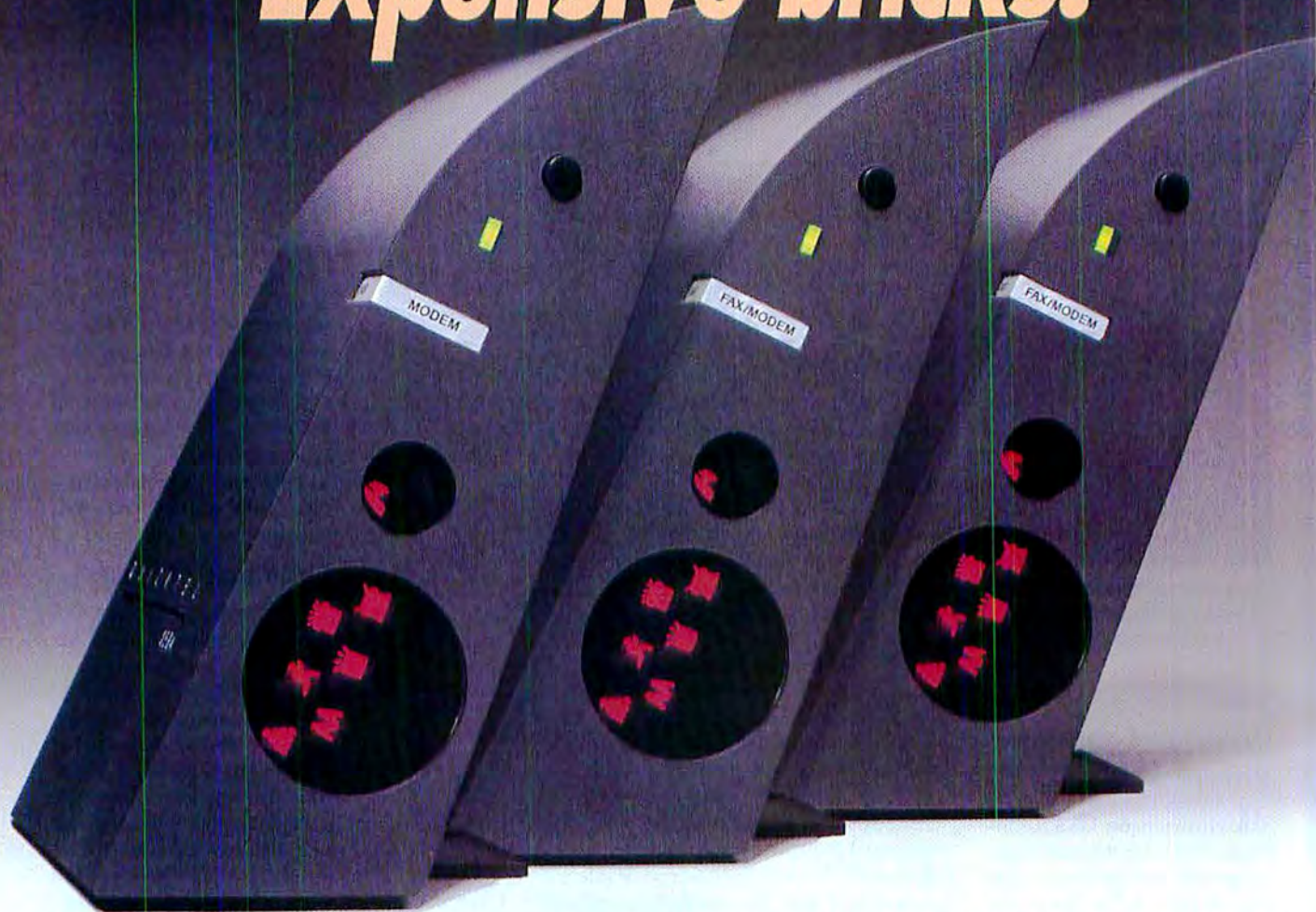
that helps editors assign and track stories. QuarkCopyDesk includes a word processor module for writers, and QuarkXPress users logged into QuarkDispatch can perform design and production.

QuarkDispatch has a programmable interface like QuarkXPress so that third-party devel-



MONA LISA'S ABUTTING
COLORS WILL NEED TRAPPING
OR CHOKING

Xebas make the other modems look like bricks. Expensive bricks.



Xeba marches on. Now there's a Xeba for every need—2400 to 9600 to 14.4K.

2400 bps Modem

A great basic modem. All the style of Xeba, complete with cables, software and power supply. Plus, you get Logicode's exclusive upgrade protection (call for details). Retail ~~\$149~~

\$109

96/96 bps Fax/Modem

Save on connect time and toll charges with modem speed of 9600 bps up to 38.4K with V.42 bis. Also incorporates 9600 bps send/receive fax and all cables and software. Retail ~~\$499~~

\$249

V.32 bis Fax/Modem

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Circle 93 on reader service card

DVI Multimedia Board

New Video Corporation has begun shipping its EyeQ Development Platform, a combination of software and several boards designed for creating multimedia applications in Intel's DVI format. Once created, the applications can run on any DVI-compatible system, whether PC, Mac, or other. EyeQ supports video

capture and display at 30 frames per second, audio, compression, and special effects. The created applications, also compatible with QuickTime, can be presentations, kiosk displays, interactive training, image databases, and so on.

The EyeQ Development Platform lists for \$14,500 including the EyeQ Delivery Board and Capture Adapter hardware, MacDVI Content Developer Software, and Mac-

DVI Application Developer Toolkit. The EyeQ Delivery Board and Capture Adapter with MacDVI Content Developer Software lists for \$7500. New Video also offers an integrated system with a IICI, at \$22,500. All configurations include MacroMind Director 3.0 through January. New Video, 310/396-4000.—T.M.

New Products for the PowerBooks

WITH THE PUBLIC CLAMORING for PowerBooks, vendors are vying to bring out products to make the notebook Macs more useful. The most interesting of these is a series of internal—yes, internal—graphics adapters that support external monitors. The tiny internal boards are from Envisio, a new company that has figured out several ingenious solutions to the problems of getting an adapter to fit into the PowerBooks' memory slots. The boards take charge of the memory map at start-up, so they can force the video map to be in a memory location where it can always be found. The products:

- The Notebook Display Adaptor supports a monochrome 13-inch, 15-inch, 19-inch, or 21-inch monitor, or any VGA monitor on the PowerBook 100. The board, which can also hold the usual RAM, lists for \$695 with 1MB of RAM, and \$895 with 2MB.

- The Notebook Display Adaptor 030 supports the same monitors and provides color on 13-inch color monitors. The Adaptor 030 works with the PowerBook 140 and 170 and accepts Apple memory SIMMs. Without RAM the Adaptor 030 lists for \$795, with 1MB it's \$1195, and with 2MB it goes for \$1595. The Envisio adapters are shipping now. Envisio, 612/339-1008.

- The PowerModem from Pinnacle Sales International sends and receives data at 2400 bps, sends faxes at 9600 bps, and receives faxes at 4800 bps. It comes with PSI's fax-modem software and is available now at a list price of \$299. PSI is also offering a series of RAM upgrades for the PowerBooks. PSI, 408/559-8544.

- The Pocket Fax Modem from Solecetek, an external device for the PowerBooks and other Macs, weighs 3½ ounces. It sends and receives faxes and data at the same rates as the PowerModem and comes with powerful software for sending faxes from within any application. The Pocket Fax Modem lists for \$349.95 and is available now. Solecetek, 619/450-1220.

- The EN/SC 10T, an external SCSI-to-Ethernet adapter from Asante Technologies, connects the PowerBooks, or any Mac, to 10BaseT Ethernet. Slated to ship in November, the EN/SC 10T lists for \$399. Asante, 408/752-8388.

- The LiteDrive PowerBook series from CMS Enhancements includes the LDPB 40 and LDPB 80, 40MB and 80MB internal hard drives, respectively. The drives have average access times of 15ms and come with utilities. The LDPB 40's suggested retail price is \$699, and the LDPB 80's is \$999. Both were scheduled for November availability. CMS, 714/222-6000.—T.M.



CLOCKWISE FROM UPPER LEFT: CMS 80MB HARD DRIVE, ASANTE ETHERNET ADAPTER, PSI MODEM, AND SOLECTEK FAX MODEM.

TREND

Mac Join DOS Nets

TWO BIG PLAYERS in the DOS networking arena have recently announced Macintosh clients. Banyan's Vines version 5.0 includes AppleTalk support, making it possible for Mac users to join DOS, Windows, and OS/2 clients connected to a Vines server. Vines Option for Macintosh provides Macs with all Vines services, including file sharing, print management, and security. Banyan also has a Mac E-mail client. Price depends on configuration.

Microsoft LAN Manager 2.1 has an add-on, developed with Pacer, called Services for Macintosh. It provides print management, file server, and backup capabilities on LocalTalk, token ring, and Ethernet. Banyan, 508/898-1000; Microsoft, 206/882-8080.—D.L.

Redesigned CAD

Three long-standing Macintosh CAD packages have come in for major upgrades recently. Computervision's VersaCAD

News



A SKYSCRAPER CREATED WITH ARCHICAD 4.0. THE FLOW OF MACINTOSH CAD SOFTWARE IS ENDLESS.

4.0 adds a dozen major features; drops the price to \$1995; and includes the architectural, drawing manager, and mechanical tools that previously were sold separately. Ashlar's \$1995 Ashlar Vellum 2.1 adds ordinate dimensioning, the ability to select parts of overlapping objects, and animation of mechanisms. A \$2495 version of Vellum retains the 2-D version's interface and adds 3-D modeling tools. Graphisoft's Hungarian import ArchiCAD version 4.0 adds fly-through ability; 24-bit color support with smooth-shading, shadow-casting, and anti-aliasing; and multilayer walls. It lists for \$4450. An upcoming version of ArchiCAD will include some tools from Graphisoft's TopCAD for architectural detailing. Ashlar, 408/746-1800; Computervision, 617/275-1800; Graphisoft, 415/737-8665.—D.L.

JUST FOR FUN

Colorful Bugs for Your Floppies

A new company called Bugy's has created a new way to get bugs—on lizards, fish, flowers, snakes, crabs, or sharks—onto your floppy disks.

The product is a set of 60 preprinted four-color disk labels, each with a different natural image on it—and the idea is to have fun and make it easier to find that elusive disk. "Hmm, let's see, I think the Dullmeister spreadsheets were on the disk with the cockroach label..." The 60-label set goes for \$34.95; an introductory special offers 180 labels for a mere \$83.88. Hey, fun is definitely not cheap. Bugy's, 415/332-9577.—T.M.



A FEW OF THE IMAGES ON BUGY'S COLORFUL LABELS FOR FLOPPY DISKS.

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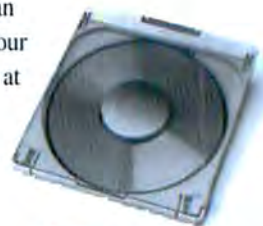
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Multimedia Merger

MEDIA GIANT TIME WARNER AND interactive entertainment developer Electronic Arts announced recently that they are teaming up to form a new firm, SMSG, that will focus on interactive multimedia. The initials "don't really stand for anything" and may change, says Trip Hawkins, chairman of Electronic Arts and president and CEO of the new venture. At this point, the firm's exact mission remains as mysterious as its name, but it certainly will take advantage of Electronic Arts' technical skill and Time Warner's vast content holdings. Hawkins wouldn't comment on whether SMSG will primarily develop titles or technology, noting only that "we're interested in markets as diverse as CD ROM and cable."—Joe Matazzoni



ERIK ADIGARD/M.A.D.

Apple Outlines Its Open Collaboration Environment

Apple has disclosed plans to create what it calls the Open Collaboration Environment (OCE), a suite of developer tools, interfaces, servers, and communications formats designed to provide dramatic new capabilities in electronic messaging, enterprise-wide directory management, security, document sharing, and related areas. OCE, when it appears, will be a set of extensions and enhancements to System 7. The environment will provide, among other things, common end-user interfaces for applications from developers already lining up in the OCE camp. The main features of OCE will include:

- Developer tools and programmatic interfaces for messaging, privacy and security, and directory management.
- An open-system architecture that will be designed to accommodate various present and future methods of sending messages and data and managing directories.
- The Open Messaging Interface (OMI), which is already being created jointly by Apple and Lotus Development, will provide compatible mail formats and messaging services between a wide variety of different computer architectures.

OCE will also address problems of incompatible data types and physical separation between senders and recipients. The general architectural design of OCE has been under development for more than two years, with the help of input from a large number of outside developers, according to Apple. The company said it would announce specific features of intended products in January 1992.—T.M.

Adobe's New View

ADOBE SYSTEMS IS WORKING on new technology for distributing documents and viewing them on screen. Old-timers who recall Solutions' SuperGlue will recognize the idea, but unlike SuperGlue's Macintosh-specific QuickDraw, Adobe is using the universal PostScript, so that Macintoshes, PCs running DOS or Windows, and Next machines can exchange documents.

A print driver creates a document by saving it in a special PostScript dialect, and a viewer utility opens and navigates the document. A special Multiple Master font is automatically substituted for missing fonts to preserve leading, column widths, and so on.

Adobe says it will deliver this technology "as an end-user product" sometime in 1992. Pricing was not decided at press time.—D.L.

Apple Board Uses IBM Token-Ring Technology

Apple's Token Ring 4/16 NB Card is Apple's first product to include technology licensed under its recent strategic alliance with Big Blue. The Token-Ring protocol allows for communication among personal computers, minicomputers, and mainframes in a network environment where many different computer architectures coexist.

The Token Ring 4/16 NB board is a NuBus bus master that transfers data at either 4MB per second or 16MB per second, depending on the speed of the Token-Ring network.



BETA WAIT

Long-awaited products

Acius's 4D Server

Shown publicly January 1991. Current ship date projected: spring 1992 in France, three months later in United States.

Farallon's DiskPaper

Shown publicly September 1990. Still in development, no ship date projected.

FoxGraph/Mac

Shown publicly August 1989. In development, no ship date projected.

FoxPro/Mac

Discussed publicly winter 1990/91. Fox says will go to beta soon, no ship date projected.

Interleaf 5

Discussed publicly October 1990. Current ship date projected: summer 1992.

Clarix's MacWrite Pro

Announced spring 1991. Current ship date projected: late spring 1992.

Picture Publisher Plus

Discussed publicly January 1991. Project canceled when Astral Development was acquired by Micrografix.

QuarkXPress 3.1

Announced April 1991. Planned to ship summer 1991; current ship date projected: end of 1991.

News

Apple is discontinuing its 4MB per second TokenTalk NB Card. Contact your Apple dealer.—T.M.

High-Speed Optical Drive

Sumo Systems has unveiled a high-speed rewritable optical drive, called the SS630, with an average access time as low as 37ms and a transfer rate of up to 1MB per second. The 600MB optical drive uses a read-write method that reduces the weight of the movable head, resulting in the faster access time.

The Sumo SS630 uses ISO-compatible 5¼-inch optical cartridges, has a high-speed SCSI-2 interface, and lists for \$4295. It is available now. Sumo Systems, 408/453-5744.—T.M.



THE SS630 OPTICAL DRIVE FROM SUMO SYSTEMS HAS A 37MS AVERAGE ACCESS TIME.

Impulse 040 Accelerator

Impulse Technology Sales has introduced the Performance/040, a general-purpose accelerator board based on the 68040 processor. The accelerator provides speeds up to twice as fast as the Mac IIx and roughly the same as the Quadras.

The Performance/040 is compatible with System 7 and with Mode32 memory-management software for address-continues

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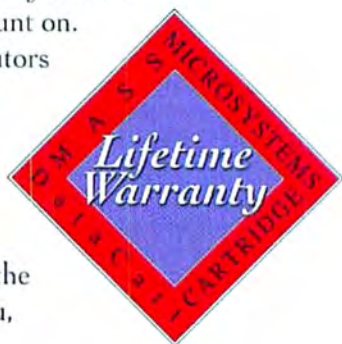
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BUG REPORT

America Online 1.0 On Macs running System 7.0 with Zapf Dingbats installed, all text appears in Zapf Dingbats. Free patch available online; to download go from Departments to Computing and Software to Software Libraries, then use QuickFinder to search for "Zapf Dingbats."

Excel 3.0 Incompatible with Mac Quadra. Microsoft is shipping free bug-fix, version 3.0a, to registered users who request it.

PageMaker Table Editor 1.0 Hairlines don't print correctly on imagesetter. Aldus will fix in major upgrade to PageMaker; date and pricing not set.

QuickMail 2.5 Remote doesn't transfer messages. 2.5a available free upon request, but sources disagree about whether it solves the problem. Also, System 7.0's File Sharing is incompatible with QuickMail; CE Software says System 7.0.1 does not solve this problem.

Taste 1.0 Frequent crashes. DeltaPoint plans to ship free bug-fix, version 1.02a or 1.03, to all registered users.

MACWORLD WILL SEND YOU A BUG REPORT T-SHIRT IF YOU ARE THE FIRST PERSON TO INFORM US OF A SERIOUS, REPRODUCIBLE BUG THAT WE REPORT IN THIS COLUMN. SEE HOW TO CONTACT MACWORLD.

ing lots of RAM. The board's eight SIMM sockets can contain up to 128MB of 80ns or faster RAM SIMMs.

The company expected to begin shipping the Performance/040 in November for \$2495 direct. Impulse, 404/889-8305.—T.M.

A View from Inside

A new imaging application can read data collected by three-dimensional scanning devices (such as CT scanners, magnetic resonance imagers, confocal microscopes, and some X-ray devices) and display the data as *volumes*—a term derived from *volume* and *pixel*.

VoxelView enables a user to visualize the inside of an object without invading or destroying the object. For example, using data collected by a CT scan, a cardiologist can look inside the heart; move about the image; and adjust colors, opacity, and contrast for clarity. Or an engineer could use data collected by an X-ray machine to study welds in a pipeline. VoxelView costs \$4000 and requires System 7 running in 32-bit mode. Vital Images, 515/472-7726.—D.L.



RADIOLOGIST PHIL KOBLIK USES VOXELVIEW TO STUDY CT SCANS ON A MAC IIFX WITH 32MB OF RAM.

The Gorilla's Voice

"VOICE" SAID KOKO in sign language, when asked what she'd like for her birthday. She had been at Stanford University where she'd grown accustomed to using a voice synthesizer, and leaving it behind was traumatic for her. Being a gorilla, Koko needs a voice synthesizer to vocalize English.

To fulfill Koko's wish, Dr. Ronald Cohn and Dr. Penny Patterson at the Gorilla Foundation along with engineers at Apple's Vivarium program designed special hardware and software so she could speak by

tapping icons on a Mac II installed in her trailer.

Now Koko has a new yearning: for motherhood. But when researchers ask her how she likes Michael, the male gorilla she grew up with, she signs the word *toilet*, so her teachers designed a new form of computer dating—showing her on-screen pictures of eligible male gorillas to see which she falls for.—Ann Garrison



THE POWER TO BE HER BEST? KOKO HAMMERS OUT A SENTENCE ON HER GORILLA-FRIENDLY MACINTOSH.

The Basic Word

Microsoft Word 5.0 will have an open architecture with user-installable modules including a grammar checker; an equation editor; and WordBasic, a BASIC-like macro/programming language.

WordBasic will execute all Word commands, provide tools for creating menus and dialog boxes, and make it possible for WordBasic programmers to give Word new functions. Word 5 also has a programming interface so it can be integrated with external programs. For example, Niles & Associates is developing a version of its EndNote Plus bibliography software that runs inside Word.



ENDNOTE COMMANDS APPEARING IN MICROSOFT WORD 5.0'S MENUS.

News

Microsoft will ship Word-Basic free to Word owners about six months after Word 5 ships. Word 5.0 will list for \$495. Microsoft, 206/882-8080; Niles & Associates, 510/655-6666.—D.L.

Reformation

THE SOLID-MODELING package Form Z will be upgraded to version 2.0. The upgrade adds hierarchical grouping for moving objects in parent-child relationships or changing objects' attributes; unlimited layers; and the ability to create and save unlimited reference planes anywhere in 3-D space. Holes drilled through solids like windows and doors can be moved or batch-duplicated. Form Z provides terrain modeling with contour maps of rectangle or triangle mesh, and the program can convert any object or surface to mesh and reshape it vertex by vertex.



A FANTASTICAL FORM Z MODEL THAT USES VERSION 2.0'S ROUNDED-EDGES AND LAND-FORM FEATURES.

Post-2.0 plans include walk-through support; motion constraints for creating hinges, cams, and other complex relationships; a reusable transcript of all commands and modifications; and reformation, that is, dynamic metamorphosis of objects. Form Z has a list price of \$999. Autodesk, 614/488-9777.—D.L.

2400 BPS DATA MODEM BUYERS: LOOK FOR THE SENDFAX™ SEAL.



If you've decided to buy a data modem to tap into information services and free bulletin boards, or move data between computers, be sure to look for the Sendfax seal on the package. With Sendfax, you'll get everything you want in a data modem, plus a *big* bonus. You'll be able to send faxes directly from your personal computer.

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Sendfax is available on the best quality data modems through your local computer retailer or direct mail marketer.

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Dealer inquiries regarding the Sierra Sendfax program
are invited. Call 800-338-7554, extension 801



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20MB Removable Drives

TWO COMPANIES have recently begun shipping disk drives with removable media that store 20MB.

Liberty Systems will offer a drive based on Insite Peripherals' Floptical drive, which uses a hybrid of optical and floppy disk technology. The Liberty Series 50 Floptical drive uses removable 3.5-inch media and has



TOP: THE LIBERTY SERIES 50 FLOPTICAL.

BOTTOM: THE QUADRAM QUADFLEXTRA.

two read-write heads, one for optical media and one for floppy disks. One of the optical disks can store about 21MB formatted, so a Floptical-type drive can potentially replace a hard drive and a floppy disk drive. The Liberty Systems drive lists for \$799. The drive has a 65ms average access time. The 1.75-pound drive is available by direct order only, and is shipped about a week after receipt of the order. Floptical disks for the drive cost \$29.

The QuadFlextra from Quadram is based on a 3.5-inch drive mechanism from Brier Technology. The QuadFlextra uses totally magnetic media with high storage density, has an average access time of 76ms, and weighs 3.5 pounds. The unit can read Flextra disks only. The drive lists for \$895 including four 20.4MB disks. A ten-pack of disks lists for \$250. Liberty, 408/983-1127; Quadram, 404/923-6666.—T.M.

Ethernet Board for HP Printers

Extended Systems' EtherFlex is an Ethernet board that fits inside Hewlett-Packard laser printers and lets users choose at installation whether they want to run Apple's EtherTalk protocol or Novell NetWare 386 for IBM PCs and compatibles. To run EtherTalk, which is much faster than AppleTalk, the printer must have HP's optional PostScript cartridge. The EtherFlex board can work in the LaserJet Series II, IID, III, and IIID printers.

Extended Systems designed the EtherFlex board with a removable protocol module; planned future modules will support other networks. EtherFlex is currently shipping at a suggested list price of \$695. Extended Systems, 406/587-7575.—T.M.

New Unix

VERSION 3.0 OF A/UX, Apple's Unix implementation, is scheduled to ship in early 1992. The new version is compatible with System 7 and the Macintosh



PETER HOEY

Quadras, has a one-button installer similar to the System 7 installer, and includes X Window managers. Pricing was not set at press time. In the United States call 800/538-9696 to locate a dealer.

Apple recently described long-term plans for A/UX, saying that the Apple-IBM agreements will not lead to replacing A/UX with IBM's AIX implementation of Unix, a scenario that caused many A/UX fans to shudder. Both Apple's and IBM's versions will eventually be able to run Macintosh applications on the IBM-designed RISC platform that Apple plans to bring to market in two or three years.—D.L.

News

Taking It to the Streets

Strategic Mapping publishes the venerable MapMaker, a thematic map-drawing package that displays data by shading regions or displaying symbols on maps of states and countries (see "Every Pixel on the Planet," *Macworld*, January 1992). Strategic is about to ship the much more powerful Atlas Pro.

Atlas Pro differs from MapMaker in major ways. It



STREETS OF SAN FRANCISCO: ATLAS PRO CAN LOCATE AND SELECT SITES BY THEIR STREET ADDRESS.

DESKTOP LIBRARIAN

Beginning Mac Books

This month we look at books written for newcomers to the Mac.

- *The 10 Minute Guide to the Mac*, by Stephen R. Poland (1991, \$9.95). This slim volume takes a practical step-by-step approach starting with the basics and moving on to the more advanced Font/DA Mover and System 7. Tightly organized. Sams, 317/571-3489.

- *The Macintosh Companion: The Basics and Beyond*, by Sharon Zardetto Aker (1991, \$22.95). At nearly 600 pages, this chatty book is for beginners who are using System 7. Most of the chapters start with the basics of a topic and move on to more advanced information. Addison-Wesley, 617/944-3700.

- *Macworld Read Me First Book*, edited by Macworld editor-in-chief Jerry Borrell (1991, \$22.95). Organized into chapters on how to choose and use different peripherals and the most common types of software, such as word processors, page-layout programs, and utilities. IDG Books Worldwide, 415/358-1250.

- *Macworld Complete Mac Handbook*, by Macworld contributing editor Jim Heid (1991, \$26.95). Starts with advice on buying a Mac, moves on to the basics, then covers just about every hardware and software topic from common applications to networking, viruses, CAD, and upgrades. IDG Books Worldwide, 415/358-1250.—T.M.



SCOTT PETERSON

FOUR BOOKS FOR THE BEGINNING MACINTOSH USER.

maintains an internal database and provides spreadsheetlike tools for manipulating and analyzing database information before displaying it on a map. Atlas Pro can create bar and pie charts; it provides a full set of tools for analyzing geographic data; and most significant of all, it can display street maps and analyze street-level data. Atlas Pro also has a much better interface than MapMaker and eliminates digging through layers of dialog boxes. Atlas Pro has a list price of \$795. Strategic Mapping, 408/985-7400.—D.L.

Relisys Monitor Works with Macs and PCs

The Model RE-1422 from Relisys is a 14-inch multi-scanning VGA monitor that continues

Use your IQ to write your fax,

Vanna's Dressing Room - - Created: Friday, December 6, 1991 11:41 AM - Page 1 of 1

V A N N A

To: Pat
From: Vanna
Date: 12/6/91
Re: The Show

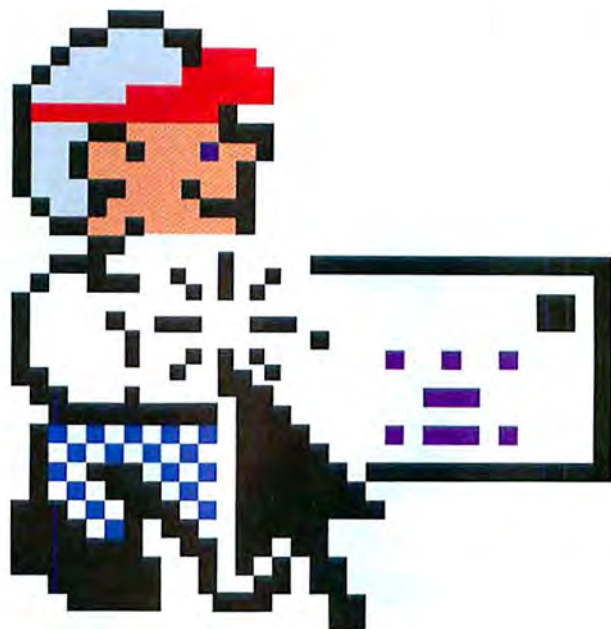
Dear Pat,

I needed to tell you how enraged I was when Merv said that turning more than two letters at a time is a challenge for me. When he told me that I can't turn letters and chew gum at the same time, I had to retard, "Oh shut! What in the sand hill is he doing to my carrier?"

Pat, be honest with me. Do you think my job is in jeopardy?

Since early,
Vanna

not to send it.



Only PSI offers a complete family of fax modems that are all as easy to use as point and click. It's just as easy as printing. So you can fax without thinking about it—and stay focused on the task at hand.

With PSI's complete family, it's easy to find a solution that fits you. Like high-speed data and fax modems, network fax modems, and even internal fax/data modems for the new Macintosh Powerbooks. All with the same, easy to use software.

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After Thousands of Hours Working With CD-ROM Drives, I Knew The Best When I Saw It.

Scholar, pianist and university professor Robert Winter is the author of the best-selling CD-ROM music software ever marketed—the Voyager CD Companion to Beethoven's 9th Symphony.



"Over the last two years I have spent more than 3,000 hours working with CD-ROM drives. I have used at least a half dozen drives, including those from all of the major manufacturers. Through hard experience I came to have very specific desires for the ideal drive — one I thought I would never see.

When I found the Chinon drive at a trade show, I couldn't believe my eyes — or ears. All the things I was looking for were there: a small (but elegant!) footprint for easy portability; a separate power supply to eliminate cooling fans and overheating; a fast 350 ms access time; direct RCA audio outputs; a headphone jack with full-range volume control; rugged construction to withstand heavy use and travel; and a great price. It's the drive I recommend to anyone who asks — with only raves from those who have

purchased it. Those who claim that CD-ROM is a slow, stodgy technology haven't tried a Chinon drive."

Chinon drives are available in external versions for both IBM-compatible and Macintosh computers, and a half-height internal version for IBM compatibles.

Experience Chinon's exciting CD-ROM/Audio drives for yourself. Call TOLL-FREE for the reseller nearest you. Whether for work or play, data or audio, it'll be music to your ears.

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IBM is a registered trademark of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 94 on reader service card

can work with Mac II's and PCs. Intended in part for organizations with both kinds of systems, the monitor is also compatible with IBM's higher-end 8514 graphics standard. The noninterlaced display provides a resolution of 1024 by 768 pixels.

The Model RE-1422's suggested list price is \$745. The monitor is shipping now. Relisys, 408/945-9000.—T.M.



ROBERT PERRY

THE 6C OMNIMEDIA FROM XRS IS A 600-DPI FLATBED SCANNER FOR PAPER OR TRANSPARENCIES.

600-dpi Scanner Does Transparencies

X-RAY Scanner Corporation (XRS) has begun shipping the 6c OmniMedia, a 600-dpi flatbed scanner that works in the usual reflective mode but can also scan slides and transparencies. For transparent scanning, a special light bar on the scanner moves in tandem with the scan head, but on the other side of the transparency.

TREND

Fourth New Integrated Package

MACVONK USA, A SUBSIDIARY OF THE European company that publishes the combination desktop publishing/integrated package RagTime, is fielding a low-end entry in the suddenly-crowded integrated software market. Beagle Bros has announced an integrated package that may be shipping by the time this story is in print; ClarisWorks and Symantec's GreatWorks are shipping now.

MacVont's new HandiWorks will list for \$175 but looks and feels an awful lot like the \$599 RagTime, with text and spreadsheet frames and frames for imported graphics. Instead of the database module found in most integrated packages, HandiWorks has a desk accessory called Address Manager that can work with HandiWorks documents when addressing letters or doing a mail merge. MacVont, 408/973-7100.—D.L.

The scanner comes with drivers and graphics software for both Macs and PCs. For the Mac, the graphics software is a complete version of Adobe Photoshop. The 6c OmniMedia is shipping now at a suggested retail price of \$3500. XRS, 213/214-1900.—T.M.

Modular Medical Library

CD ROM technology is being put to good use as a medium for distributing quarterly updates of standard medical reference materials to doctors. Teton Data Systems (the company was founded by a Wyoming physician) publishes a CD ROM called Stat-Ref. Version 3.0 is getting a major upgrade with a new front end and search tools built on the Personal Librarian engine (see "Big Words," *Macworld News*, July 1991).

The CD will contain 20 locked volumes that can be opened by calling in a credit card number to obtain a password. Stat-Ref 3.0 will be able to rank search results by relevance based on frequency and proximity of search terms and will have hyperlinks to jump between references. Price depends on the number of volumes unlocked. Teton Data Systems, 718/729-1888.—D.L.



PETER HOEY

EPA Restricts Internal Mac Use

THE ENVIRONMENTAL Protection Agency recently issued a policy statement cutting back on the agency's support for Macs. Macs have become popular at the EPA for general-purpose use, but the document reads, in part, "[EPA] will continue to provide limited support for Macintosh computers, but ONLY when those computers are used for scientific applications for which solutions are not available in the MS-DOS

News

environment or as desktop publishing systems." The agency cited the cost of supporting both Macintosh and DOS users, and pinpointed networking and communications costs as the straw that broke the camel's back.

Donald Fulford, who as director of the EPA's National Data Processing Division issued the policy statement, did not return *Macworld's* phone calls.—D.L.

Mail-Order House Shuts Down

CDA Computer Sales, a \$12 million Macintosh mail-order company, is about to file for bankruptcy. The company has reportedly sold off all of its inventory and shut down its operations. CDA president Marc Daniels said he will try to pay back customers who paid for products they did not receive, but some will not get their money back.

New Jersey police investigating CDA received over 1400 customer complaints before turning the investigation over to the U.S. Postal Service. Consumers should forward their complaints, with copies of canceled checks and invoices, to: U.S. Postal Service, P.O. Box 509, Newark, NJ 07101, Attn: Fraud Section.—Carolyn Bickford



MANUELLO PACANELLI

MICHELLE KIENHOLZ WITH HER DEAD JASMINE DRIVE FROM CDA.



TURKEY SHOOT

EARLY SIGHTINGS OF PROBLEM PRODUCTS

Summagraphics' Demon Summagraphics' installer puts the digitizing tablet's driver inside the System file. When the INIT conflicts start you can't just dra-a-a-g it out of the System Folder. What a drag.

Aldus Table Editor Look under the File menu. Surprise! No Print command.

QMS and Adobe Is she or isn't she? Only her code-parser knows for sure. We'd like to know if the QMS-PS 410, 815, and 825 are entirely Adobe PostScript or mostly QMS's UltraScript.

Macworld will send you a Turkey Shoot T-shirt if we shoot your turkey in this column. See *How to Contact Macworld*.

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Inc. lets you create over 100 different types of reports and analyses. With the touch of a button you get customer statements, account agings, sales analysis, income and balance sheets. You name it.

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Accountant, Inc. suggested retail price: \$595. Multiuser (3 users) Introductory price \$995 (suggested retail: \$1295);

Additional user modules, introductory price: \$195 (suggested retail \$295); Upgrade to MultiUser \$300, or \$250 with extended support.

This offer expires February 29, 1992 and cannot be used with any other offer or promotion.

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1(800)933-2537
Softsync, Inc.

Requires Apple Macintosh with at least 2 megabytes of memory and hard disk. Works with Plus, SE, SE/30, II, IIfx, IIfx, Portable, Classic, Classic II, Powerbook 100, 140 & 170, Quadra 700 & 900, si, LC, ImageWriter, LaserWriter, StyleWriter, Appleshare and Multifinder. Copyright 1991, Softsync, Inc. Accountant, Inc. and Accountant, Inc./Multiuser are trademarks of Softsync, Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc. All other trademarks acknowledged.

Circle 367 on reader service card

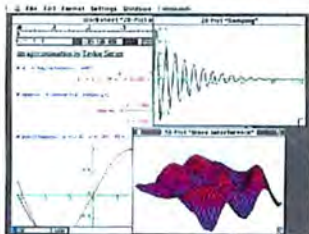
MicroNet's Quadra SCSI Manager

THE MICRONET SCSI MANAGER is a software driver that lets a Quadra 700 or 900 transfer data faster and allows the 900 to support up to 14 SCSI devices. The data-transfer rate improves from 3.5MB per second with Apple's SCSI Manager to 4.7MB with MicroNet's software, according to the company. The support for 14 SCSI devices on the Quadra 900 is possible because the driver logically separates the 900's two SCSI connectors. However, up to seven of the SCSI devices must be from MicroNet.

MicroNet has begun shipping the software with all of its drives for the Quadras. With its Micro/Raven040 disk arrays the transfer rate goes up to 7.1MB per second (see *MacBulletin*, January 1992). The company expected to begin shipping a version with mirroring capability in December 1991. MicroNet Technology, 714/837-6033.—T.M.

Maple Turns Over New Leaf

The combination symbolic and numeric algebra processor Maple has been upgraded to version 5. The new version adds three-dimensional plotting and supports more integrals and functions. Like Mathematica, Maple runs on a



AN EXAMPLE OF MAPLE'S WORKING ENVIRONMENT AND GRAPHS.

wide range of computers and can share command files across platforms. Maple provides tools for combinatorics, geometry, group theory, statistics, linear algebra, and many other kinds of mathematics. \$450; site licenses are available. Waterloo Maple Software, 519/747-2373.—D.L.

Alisa Expands into Unix

Alisa Systems is widening the reach of its Mac-to-VAX VMS connectivity product, AlisaTalk, with a full set of Unix tools. AlisaTalk for Unix provides services to Macs attached to Sun, Digital, and IBM systems running Unix, Ultrix, or AIX. Like the VMS product, AlisaTalk for Unix provides file sharing and file transfer; print spooling using the Unix machine or direct access to printers on the network; and terminal emulation for the Mac. The new AlisaTalk also provides access to UUCP-based E-mail systems and has a suite of management tools. Price depends on CPU. Alisa Systems, 818/792-9474.—D.L.

Ink-jet Printer Produces Large Images

The Bezier Systems BP3670 is a large-format thermal ink-jet printer that can print on paper up to 17 inches wide. The printer produces about 6 letter-size pages per minute at 180 by 180 dpi and can also print at 360 by 360 dpi.

The BP3670 comes with a raster image processor (RIP) for WYSIWYG output on Macs or Sun SPARCstations. The printer has a SCSI port for faster data transfer. Available now, the BP3670 lists for \$1995. Bezier Systems, 408/345-0345.—T.M.



THE BP3670 LARGE-FORMAT INK-JET PRINTER FROM BEZIER SYSTEMS.

A Speeding MacRenderMan

STARTECH HAS COME OUT with a NuBus accelerator board designed to add some whizbang to MacRenderMan, Pixar's photo-realistic rendering package. The 860Edge uses Intel's i860 RISC processor to render

News

graphics about 10 times faster than a Mac IIx, according to StarTech. The board runs in the background under MultiFinder and holds up to 128MB of RAM.

The accelerator works with all NuBus Macintoshes from the Mac II Rev B (later units of the Mac II) on up, including the IIs. The 860Edge is currently shipping for \$6695 without RAM, \$6995 with 8MB, and \$7995 with 32MB. StarTech, 619/457-0781.—T.M.

Fast SCSI-2 for the Quadras

The Data Cannon II from Storage Dimensions is a Fast SCSI-2 NuBus board for the Quadras that can double those systems' data-transfer rates and support an additional seven SCSI devices. With the board the Quadras can sustain up to a 10MB-per-second transfer rate.

The board will support Fast SCSI-2 drives expected to be available from Storage Dimensions and others by the end of 1991. The Data Cannon II is slated to ship in January at a list price of \$999. Storage Dimensions, 408/954-0710.—T.M.

VIRUS WATCH

CURRENT VIRUSES,
TROJAN HORSES, AND WORMS
AFFECTING
THE MACINTOSH COMMUNITY.

Zuc C

TYPE: Virus
FIRST LISTED IN VIRUS
WATCH: 10/91
INFO: A Zuc clone.
IMPACT: Nondestructive;
infects applications and
system files; renders cursor
inoperable

HC

TYPE: Data Virus
FIRST LISTED IN VIRUS
WATCH: 6/91
INFO: Infects HyperCard
stacks.
IMPACT: Causes the Mac to
hum oddly.

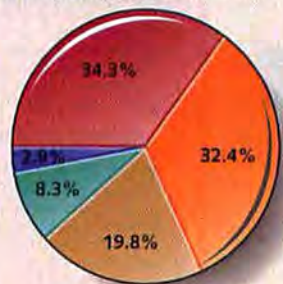
nCam

TYPE: Virus
FIRST LISTED IN VIRUS
WATCH: 5/91
INFO: An nVIR clone.
IMPACT: Nondestructive;
infects applications and
systems files; can cause
crashes.

Reader Survey: Apple-IBM

The Apple-IBM agreement is
very beneficial to end-users.

The long-term results for
Apple will be beneficial.



Strongly agree Agree Disagree Strongly disagree

This month's survey was mailed to 750 readers; 398 usable responses were returned.

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Hayes Personal Modem 2400 Plus with Smartcom

The Hayes Personal Modem 2400 Plus provides you with everything you need to go on-line. This 2400 baud modem has a built-in call-monitoring speaker and two LEDs, plus both phone and computer cables. Included in the package is the Smartcom terminal software to make using your modem simple and convenient. It fully supports the Mac interface. Also emulates popular terminals, such as TTY and VT52/102, to make mainframe and mini access easy. File transfer protocols include XModem and MacBinary.

Manufacturer: Hayes MOD0060

\$149

FoxBASE+/Mac 2.0

Combines the flexibility of the dBase language, the speed of FoxBase+, and the userfriendly Mac interface. Runs all your dBASE III Plus programs on the Mac, without requiring you to change a single line of source code. In NSTL benchmarks, it outperforms other relational database managers, some by as much as 200 times. Version 2.0 has an improved report writer that creates complex columnar and free-form reports - without programming. Procedure language now provides access to up to 16 HyperCard external functions and commands (XFCNs and XCMDs). Manufacturer: Fox Software DAT0047



\$295



PacerTerm

Combines today's standards—Communication Toolbox and HyperTalk scripting—with a comprehensive collection of file transfer (FTP, Kermit, XMODEM, ZMODEM and others) and connection protocols (TCP/IP, LAT, and others). Keyboard remapping, on-screen SoftKeys, and multiple VT320 terminal windows let PacerTerm users create powerful front-ends to host applications and on-line services. COM0106 \$159.

PacerForum

Get your workgroup working! An innovative conferencing and bulletin board application that provides easy and efficient distribution of information on any AppleTalk network. With PacerForum's icon-based graphical user interface, you can share, organize and archive text, files, pictures and sounds. 7/30/91 MacWeek calls PacerForum "a very useful tool that will greatly facilitate office communications." Publisher: Pacer Software NET0167

\$355

Timeslips III 2.0

Timeslips III 2.0 is a complete time keeping and billing package. You gather time data with TS Timer DA. When the time comes to send the bill, TS Report will extract the data and generate invoices and reports in a wide variety of formats. Timeslips can handle the big jobs: 250 users, 250 different activities and over 3,000 clients, with up to 128 projects per client.

Publisher: Timeslips Corporation BUS0043



\$195



WristSaver/ WristSaver MousePad

The WristSaver cradles your wrist with a contoured neoprene rubber pad and a nylon covering. It's ergonomically designed to

support your wrist at the proper angle to help avoid the pain associated with Carpal Tunnel Syndrome. The WristSaver MousePad provides a comfortable rest for your wrist, plus a conventional mouse pad. Simple finger movements replace sliding the entire arm or hand.

Manufacturer: LB Innovators
WristSaverMousePad ACC0634 \$18.
WristSaver ACC0550 \$18.
Bundle BND0031
(Available in Gray, Black, Red or Navy)

\$29



ClickArt Color Graphics for Presentations

Contains more than 250 high-quality, full color images created specifically for use in slide presentations. The images have been designed to deliver quick, clean visual impact against color backgrounds typically used in presentations. The subjects, appropriate for any type of business presentation, include people in office related situations, time, money, flags, maps, business symbols, communications equipment, computers, hand symbols, backgrounds, arrows, logos and more. ClickArt Color Graphics for Presentations is available in PICT2 format for the Macintosh and works with: Aldus Persuasion®, MS®, PowerPoint®, CA-Cricket® Presents™, or any other application that imports PICT2 files. Publisher: T/Maker GRA0272

\$109



ProModem 2400 Mini Plus

Now you can get V.42bis/MNP-5 data compression and error correction in a mini-sized 2400 bps modem, for up to 9600 bps throughput! All the features of a full sized modem at half the price and size. Offered as a complete communications package with MacKNOWLEDGE™ communications software and cable. Manufacturer: Prometheus MOD0068

\$149

Meeting Maker

Meeting Maker™ is a Macintosh network application that helps you plan, schedule and confirm meetings. You can schedule a time and date, select required guests, reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out personal activities. 5-User BUS0165 \$309.

Instant Update

Instant Update™ is a breakthrough collaborative application for Macintosh networks that helps you communicate through live documents. Create live documents just like any word processing document, and then distribute the document to other users on the network. Press the Update button when there is a black "incoming" arrow, and any changes that were made to the document are automatically incorporated into your copy. Publisher: On Technology 2 User COM0096



\$309

FREE

POWER USERS TOOL KIT 7.0

If you're not already a collector of Steven Bobker's highly successful Power User's Tool Kit - compiled exclusively for MacWAREHOUSE - you'll want to start with version 7.0. It's stuffed with ten useful applications, utilities, desk accessories, INITs and System 7.0 extensions for your Macintosh. They're great productivity enhancers and you'll be surprised how easy they are to use.

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And the best thing is, the programs are shareware so you can try them FREE when you order from MacWAREHOUSE. You pay only \$1.50 shipping and handling if you want the disk. If you wish to continue using the software, some authors ask that you pay a small fee (\$5-\$25). All the details are explained on the disk, which is yours to keep. Please remember to ask for item # AAA 0013 when you order.

White Knight V.11

• The perfect low-cost solution to almost any Mac telecommunicator's needs. Offers the kind of power associated with products costing hundreds of dollars more, but is easier to learn and more flexible. 270+ page user manual is geared to all levels of experience. Winner of 11 awards including MacWorld's World Class Software Award 1987-1991. Publisher: Free Soft COM0060

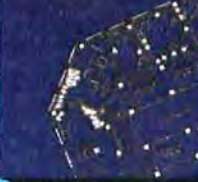


\$85

BLUEPRINT

Blueprint 2.1

• Blueprint makes 2D drafting and design easy. It has a hierarchical symbol library, automatic alignment, auto-dimensioning, and witness lines. It calculates with 9-decimal precision, so you can work at any convenient scale. Blueprint offers unlimited layers, color, hatching, mirroring, and a built-in DXF translator. Blueprint also exports EPS files. Publisher: Graphsoft CAD0024



\$219

WordScan

• WordScan offers the same basic OCR capabilities as WordScan Plus but does not include the more advanced features. UT10215 \$249.
• WordScan Plus offers accurate OCR with a wealth of user conveniences. Special dictionaries help WordScan read pages other software can't read. It even reads faxed documents and draft-quality dot matrix output. Deferred Processing allows you to scan now and process later. Advanced features include: Pop-Up Image Editor, AutoClipping and Style Sheets. Publisher: Calera Recognition Systems UT10216



\$739

THINK C 5.0

• Integrates the editor, linker, and compiler to form a complete C language development environment. A multi-window text editor and a source-level debugger make finding and solving problems fast and painless. It's all new ANSI C compiler and code generator produce compact, efficient code, which is 32-bit clean. Runs in System 7.0 in either 24- or 32-bit mode, with or without virtual memory. Publisher: Symantec LMG0051



\$199

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Accountant, Inc. is the most complete integrated accounting and financial management package for the Mac," says MacUser magazine. It's an easy to use program that gives you exceptional power to streamline your accounting. You only have to enter information once because every transaction is automatically posted to the General Ledger. Accountant, Inc.'s revolutionary System 7 design means you can customize your forms, screens and reports by hot linking with your favorite forms design, spreadsheet and data base programs. You get Invoicing, Accounts Receivable, Inventory, Accounts payable, Check Writing, General and Payroll. Accountant, Inc. is available in single and multiuser versions. Publisher: SoftSync/BLOC FIN0048

\$339

Symantec AntiVirus for the Mac (SAM) 3.0

SAM detects viruses by monitoring the suspicious activities that characterize them. New version 3.0 has enhanced update and repair capabilities, faster scanning, and more. The INIT portion acts like a watchdog during startup to detect viral activity. The GDEV portion operates during normal Mac usage, and offers a number of options for checking disks and folders as you work. Audit Trail keeps track of its activity and your responses. Includes Virus Clinic. Publisher: Symantec UT10214

\$65



The UnMouse

The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. Manufacturer: Microtouch INP0084

\$159



HAND-Off II ver. 2.2.1



Get HAND-Off II for fast, easy file access. ••SuperMenu™ for System 7 makes the Apple menu multi-level. Instantly open or browse an unlimited number of files, folders, applications or aliases hierarchically. ••Pop-up menuing speeds opening files and applications with "Bridges™" which create custom groups of applications and/or documents. ••"On-the-fly" application substitution eliminates the annoying "Application Not Found" error message. ••Switches application color depth and sound level automatically. ••AutoSlide™ reduces Desktop clutter by automatically hiding background applications. Publisher: Connectix UT10148

\$56



PowerCache

33, 40, 50 MHz PowerCache. Here's the affordable way to get the maximum from your software. DayStar's proprietary technology combines a blazing fast 68030 processor with a superfast RAM cache. Now you can get 0/0 performance with proven 0/0 compatibility including System 7.0 virtual memory. Accelerates virtually every function in all applications. An optional math chip is a real time saver for spreadsheet recalc and scientific tasks. The universal design makes it easily transportable to almost every Mac including the SE/30, II, IIfx, Ilex, LC, IIsi & IIfx. Guaranteed 100% compatible. Manufacturer: DayStar Digital See line listings for prices. PowerCache 40MHz DR10467

\$949



Puzzle Master

Solve crossword puzzles or create your own. Includes 250 of The New York Times® classic puzzles, 200 daily puzzles and 50 Sunday puzzles. Built-in timer and scoring system allows you to test your skill against the experts. ENT0383 \$29.

Canis

A new educational/reference program for current and prospective dog owners. Includes VGA pictures of most popular breeds, health care, and nutrition. ENT0384 \$27.

Blackjack Strategy Tester

Test Blackjack betting and playing strategies by playing up to 100,000 hands under a broad variety of setups. ENT0329 \$65.

Casino Master

Offers all the fun of playing the odds in Las Vegas without the risks. Simulates the five most popular casino games: Blackjack, Craps, Roulette, Poker, and Baccarat.

Publisher:
Centron Software
ENT0277

\$40

Targus Universal Notebook Carrying Case for the Mac

Designed especially for the new generation of Notebook Macs, The Targus Universal Notebook Carrying Case provides a convenient way to tote your computer and accessories (including a printer). Two padded compartments (11x13x2.5 inches each) keep your Notebook computer and accessories separated. Non-skid rubber feet, rugged Coskin finish, velcro closures and self-healing nylon zippers top it off.



Manufacturer: Targus
ACC0675

\$79



Rapport

Use any combination of Rapport and Kennet's Drive 2.4 (3.5") or Drive 1200 or Drive 360 (5.25") to read, write and format all Mac and IBM formats on your Macintosh. Or use Rapport alone on older Macintoshes to read IBM files from your internal drive. Manufacturer: Kennet Technology

Drive 2.4 DR10141 \$325.
Drive 360 DR10219 \$259.
Drive 1200 DR10218 \$259.
Rapport DR10140

\$195

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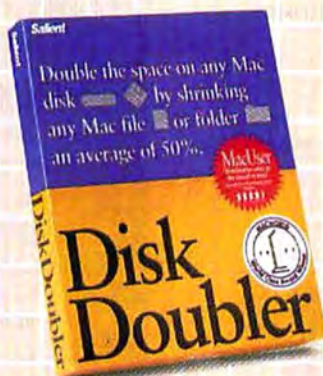


MacPrint 1.2

Use a Macintosh with non-Apple printers. Print Mac applications on HP LaserJet, Deskjet or compatible printers including all Series IIs, IIsx and the Deskjet 500. Prints text and graphics at the printer's maximum resolution.

Does not require PostScript. Cable is included. Publisher: Insight Development UT10098

\$95



Disk Doubler 3.7

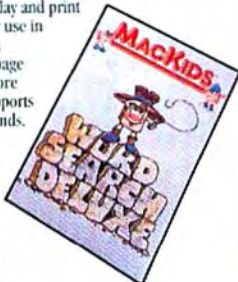
Disk Doubler 3.7, the system 7 savvy version, can double your hard disk and floppy disk storage capacity without the expense of an additional hard disk. The new version provides even more enhancements, including smaller compressed file sizes, increased compression speed, and self expanding files, which may be expanded without needing the Disk Doubler application. Disk Doubler can also split large files into pieces for backup purposes and combine files together for telecommunications. Works transparently within any application, and operates in the background under MultiFinder. Disk Doubler works with documents, applications, plus sound graphics, and scanner files. Publisher: Sallent Software UT10179

\$49

Word Search Deluxe

Perfect for newsletters, classrooms, and puzzle enthusiasts everywhere. Fun to create. Fun to play. Improve your vocabulary in any subject. Use as stand alone application to create, play and print word search puzzles or use in combination with word processing, paint and page layout programs for more decorative results. Supports color and digitized sounds.

Publisher: Nordie Software EDL0276



\$35



MAXIMA 2.0

4MB SIMM users! MAXIMA 2.0 extends your RAM access to as much as 128MB. Creates a powerful non-volatile RAM disk that survives system crashes, restarts, and shutdowns. Use the RAM disk to reduce boot time, accelerate many routine operations, and

speed up memory intensive applications. Get MAXIMA 2.0 to maximize your RAM investment for System 6 or 7 in 24- or 32-bit mode. Publisher: Connectix UT10209

\$45



The "ULTIMATE" Classic & Classic Extended Carrying Case

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Manufacturer: I/O Design, Inc.

Ultimate Classic

ACC0529 \$65.

Ultimate

Classic Extended

ACC0440

\$85



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Aldus Persuasion, Quark XPress 3.1		ea. 52
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DRI 0206

Manufacturer: PowerUser

\$589

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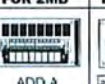


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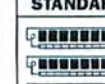
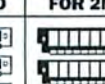
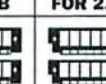

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(Ask for item # CHP0012 120NS)

	STANDARD	FOR 2MB	FOR 2.5MB	FOR 4MB
				
MACINTOSH CLASSIC	1MB SURFACE MOUNT	ADD A 1MB EXPANSION CARD	ADD A 1MB CARD & 2-256K SIMMS OR ADD A 3MB EXPANSION CARD	ADD A 1MB CARD & 2-1MB SIMMS OR ADD A 3MB EXPANSION CARD


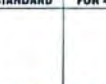
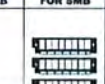

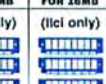



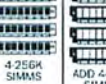







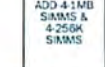




The Mac Classic comes with a standard 1MB of memory, which is surface mounted (soldered) to the motherboard. Additional memory for your Mac Classic is provided by an Expansion Board, which slides into a slot on the Classic's motherboard. The Expansion Board can be purchased with 1MB of memory (for a total of 2MB), and then two 1MB SIMMS can be added to the Expansion Board later for a total of 4MB. Or, you can install a 3MB Expansion Board, which brings your Mac Classic up to its full 4MB.

	STANDARD	FOR 2MB	FOR 2.5MB	FOR 4MB
				
MACINTOSH PLUS & SE	4-256K SIMMS	ADD 2-1MB SIMMS	ADD 2-1MB SIMMS & 2-256K SIMMS	ADD 4-1MB SIMMS



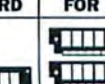


The Mac Plus and Mac SE have four available slots on the motherboard, which originally contain four 256K SIMMS modules - totalling 1 megabyte (1MB) of memory. To upgrade, you can replace each 256K module with a 1MB module, but you must do this in pairs. Replace two 256K modules and you will have a total of 2.5MB of memory. (That's the two new 1MB modules plus the original two 256K modules.) Replace all four modules and you'll have 4MB. (You should save the 256K modules for later use if you want to pass your Mac on to someone else.)

	STANDARD	FOR 4MB	FOR 6MB	FOR 10MB
				
MACINTOSH LC	2MB SURFACE MOUNT	ADD 2-1MB SIMMS	ADD 2-2MB SIMMS	ADD 4-2MB SIMMS

The Mac SE/30, II, IIx, IIcx, and IIfx each come with a total of eight slots. The standard configuration has four 256K SIMMS modules, or a total of 1 MB. Here, memory must be upgraded in multiples of four. This allows for expansion from 1MB to 4, 5 or 8MB on the II and IIx, and up to 32MB on the SE/30, IIcx and IIfx, depending on whether you are using 1MB, 2MB or 4MB SIMMS. If you are upgrading a Mac IIfx, you must use SIMMS rated at 80ns or faster.

	STANDARD	FOR 4MB	FOR 5MB	FOR 8MB	FOR 9MB	FOR 16MB	FOR 32MB
							
MACINTOSH SE/30	4-256K SIMMS	ADD 4-1MB SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS
							
MACINTOSH II, IIx	4-256K SIMMS	ADD 4-1MB SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS
							
MACINTOSH IIcx, IIfx	4-256K SIMMS	ADD 4-1MB SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS	ADD 4-1MB SIMMS & 4-256K SIMMS

The Mac IIfx comes with a standard 1MB of memory, which is surface mounted (soldered) to the motherboard. Four slots are available for additional memory, and you must upgrade your Mac IIfx in multiples of four. The Mac IIfx is expandable to 5, 9 or 17MB, depending on whether you are using 1, 2 or 4MB SIMMS, and the SIMMS modules must be rated at 100ns or faster.

	STANDARD	FOR 5MB	FOR 9MB	FOR 17MB
				
MACINTOSH IIfx	1MB SURFACE MOUNT	ADD 4-1MB SIMMS	ADD 4-2MB SIMMS	ADD 4-4MB SIMMS

The Mac LC comes with a standard 2MB of memory, surface mounted (soldered) to the motherboard, with two slots available for additional memory. The Mac LC can be upgraded to 4, 6, or 10 MB, depending on whether you are installing 1, 2 or 4MB SIMMS.

**FREE STEP-BY-STEP
VIDEO INSTRUCTIONS****

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WAREHOUSE**

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A unified workspace you can customize

The first thing you'll appreciate about Lotus 1-2-3 Mac is the way everything is kept together in a single file. Spreadsheet data, text blocks, graphs, drawn objects, and macros all stay together and are available whenever you open the document. Tear-off menus put formatting, graphing and drawing tools at your fingertips, anywhere on the screen. And you can customize Lotus 1-2-3 Mac by adding your most frequently used formats, styles, and macros right to the on-screen menus.

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Once you've collected all your data and analyzed it, you probably need a meaningful way

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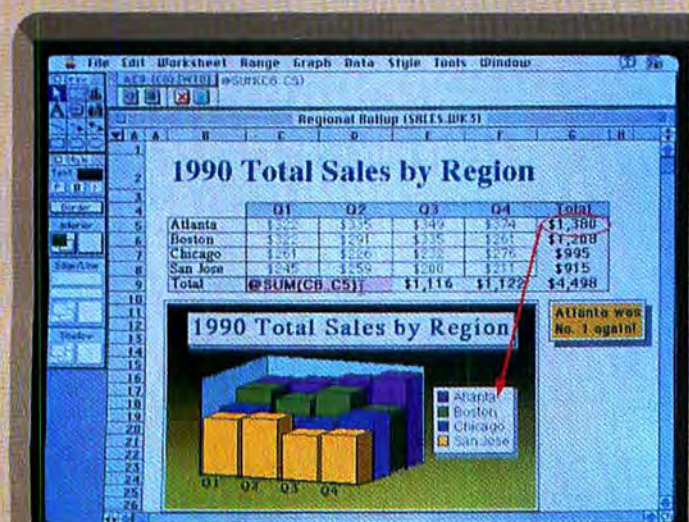
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Circle 10 on reader service card

Desktop Publishing Diversifies

TODAY'S
PUBLISHING
PROGRAMS

SATISFY
PROFESSIONALS
AND

NOVICES
ALIKE

BY JIM HEID

IF FREEDOM OF THE PRESS belongs to those who own one, as the saying goes, then a lot of people have been buying into the First Amendment. If you're about to join them, you'll probably start by investigating the two programs most people associate with desktop publishing: Aldus PageMaker and Quark's QuarkXPress.

But the market is growing, and you owe it to yourself to check out the rest of it. If you're new to publishing or on a tight budget, you might find an entry-level program appealing. Besides streamlining the publishing process, programs such as Aldus Personal Press and Timeworks' Publish It Easy retail for about half of what more sophisticated programs cost.

For book and technical publishing, there are new versions of the so-called long-document programs: Ventura Publisher, Macintosh Edition, and Frame Technology's FrameMaker. The latter allows you to create "smart" documents that can change and update themselves—Johannes Gutenberg meets Buck Rogers.

To pick the right program, first determine the types of publications you will create. Brochures and menus, newsletters, books, scientific papers, advertisements—every piece has its demands, and some programs meet them better than others. Next, consider your hardware. Low-end packages run on Mac Classics, SEs, and Pluses, but most other programs

crawl on them. Finally, consider yourself—your design and layout skills and the extent to which you want to immerse yourself in publishing minutiae.

Points of Comparison

IT'S ALSO IMPORTANT TO ASSESS HOW the programs you're considering approach desktop publishing. The most basic point of comparison concerns the way you position text and graphics on the page. Two schemes predominate: the on-the-fly, import-and-place scheme exemplified by PageMaker; and the draw-a-frame-and-then-import approach of QuarkXPress and most other programs. Some designers find the former approach preferable for experimenting with layouts—it is also more akin to the way a layout artist works. A frame-oriented scheme lends itself to periodicals, books, and manuals, where consistency and planning are paramount. Most programs also let you type position values in a dialog box—handy for precise positioning.

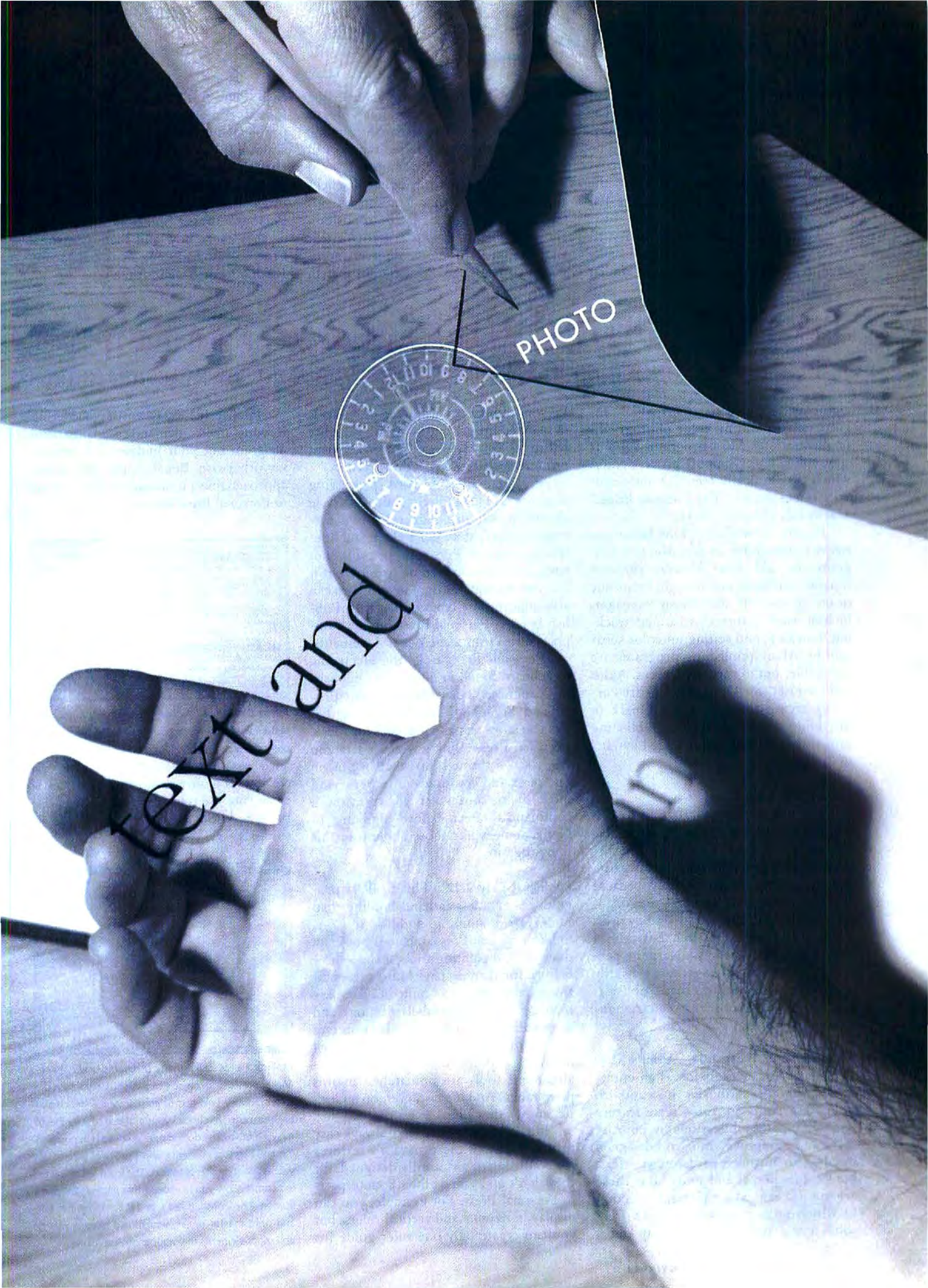
Some programs add word processing, drawing, and painting features, saving you from the expense of additional software and from having to endure the chore of importing elements created in other programs. But the features in these do-all programs rarely match those of stand-alone equivalents—and when they do, only a fast Mac with lots of memory can accommodate them.

All publishing programs can import files from word processors and graphics

programs, but some do a more thorough job of it—or recognize a wider variety of documents—than others. The ability to export text files from a publication allows you to update word processing files to reflect last-minute edits made on the layout.

Most publishing programs allow you to create documents with hundreds of pages (although it's smart to divide tomes into more manageable chunks). Other programs limit document length to available memory or storage space. In a similar vein, some publishing programs, including PageMaker, can open only one document at a time. That means more work when you want to reuse elements from other publications.

A publishing program is also a typesetting program. Nearly all publishing programs let you manually *kern*—adjust the spacing between characters to improve the look of headlines and other text. Most also offer automatic kerning features that tighten such obvious candidates as *To* and *AW*. But precision



PHOTO

text and

varies: costlier programs provide finer kerning than low-end ones. You also pay more for *tracking*, a feature that adjusts word spacing and letterspacing based on type size; and for *justification* controls, which enable you to precisely adjust the spacing of text aligned against the left and right margins.

Then there's color in its two varieties: *spot color*, in which color is usually used to set off rules, headings, or similar

publication within the AutoCreate dialog box by assigning text and graphics files to a template's elements (see "Automatic Layout"). I would like to see that sort of innovation in costlier programs.

Personal Press is no slouch at click-and-drag layout, either. You can use on-screen guides or dialog boxes to position and size elements. You can rotate text and graphics in single-degree increments—a feat PageMaker cannot match.

each. Publish It Easy supports fewer file formats than does Personal Press and has problems importing and printing gray-scale TIFF files unless you allocate roughly 2MB of memory to the program. Its gray-scale modification features also fall short of those offered by Personal Press. And Publish It Easy crashes every now and then. (Personal Press 1.0 also had some gnats, but version 1.01 performed well for me.)

TO PICK THE RIGHT PROGRAM, DETERMINE THE TYPES OF PUBLICATIONS YOU WILL CREATE, THEN CONSIDER YOUR OWN DESIGN SKILLS

elements; and *process color*, which involves incorporating color photographs or illustrations. Most programs support spot color; fewer support process color, which is technically complex and hardware intensive (see "The Prepress Edge," Macworld, October 1991).

Finally, *extensibility*. This buzzword refers to the ability to accessorize a program—to add new features through separate software modules that you buy or create yourself. Publishing extensions include such features as refined tracking, indexing, and setting up color separations. Many publishing programs are extensible, but to varying degrees. Aldus and Letraset (for DesignStudio) are currently trying to catch up to Quark in providing more malleable publishing programs (see "Enhancing Page Layout," in this issue).

Taking the Low Road

IF YOU WANT TO AVOID LEARNING publishing arcana; if you have a Mac Classic, Plus, or SE; or if you can't justify a costlier program, take the low road. But choose your route carefully, because the top contenders in this category—Aldus Personal Press and Timeworks' Publish It Easy—approach entry-level publishing from widely divergent perspectives. Personal Press is more elegantly designed, but it does less than Publish It Easy. You must choose between friendliness and features.

Aldus Personal Press 1.01 Aldus's \$299 Personal Press takes its job as an entry-level program seriously; it wants to hold your hand. An AutoCreate feature lets you create publications by pouring text and graphics into predesigned molds—for business cards, newsletters, books, brochures, and more. But these are not just canned templates, a selection of which most programs include. Personal Press actually lets you lay out a

Personal Press can also alter gray levels in scanned images and print high-quality halftones on low-cost, non-PostScript printers such as Apple's StyleWriter.

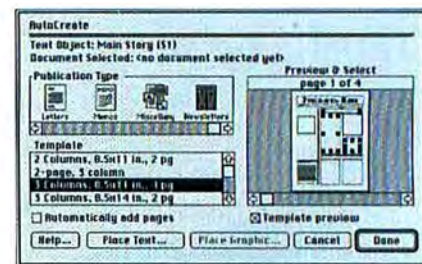
Personal Press's word processing features are complete, but its style sheets (which automate repetitive formatting) don't store tab, indent, and line-spacing settings. Personal Press does not have an automatic kerning feature, but it lets you manually kern. The program can also import more types of files than Publish It Easy. Personal Press can even import stories from PageMaker documents.

Personal Press lacks the electronic pasteboard found in most other publishing programs, but each document provides a Scrapbook-like workbook that lets you store text and graphics for reuse. Personal Press's link navigator lets you easily scroll through text that begins on one page and continues on others. And most dialog boxes let you preview a command's effect before applying it. Conveniences like those abound in this fine program.

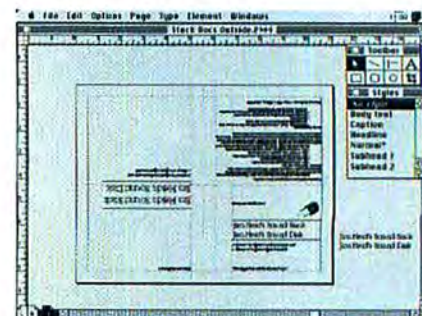
Publish It Easy 2.12 This \$249.95 program believes less in hand-holding than in feature cramming. Publish It Easy, unlike Personal Press, includes powerful drawing and painting tools; a slide-show feature for turning pages into presentations; and even a built-in database manager for creating labels, catalogs, and personalized form letters. The program also provides automatic and manual kerning, and its drawing and object-alignment tools are unmatched in this price range. And it's fast, even on a Classic, an SE, or a Plus.

But Publish It Easy isn't always easy to use. Many of the program's features are confusing or awkwardly designed. Or they don't go as far as their counterparts in Personal Press. For example, you can display horizontal and vertical rulers, but you can create only one ruler guide for

Publish It Easy is worth considering if your needs demand a mainstream program but your budget or hardware say otherwise. But if you're after basic, approachable publishing features, look to Personal Press instead.



Automatic Layout Aldus Personal Press's AutoCreate feature lets you quickly pour text and graphics into a predefined template. Here, one of Personal Press's several newsletter templates has been opened and one of its stories selected in the preview box. Clicking on the Place Text button and then choosing a text file causes Personal Press to import the text into the selected blocks.



Making Pages Like many programs, Aldus PageMaker provides an on-screen pasteboard you can use to temporarily hold text or graphic items—much as a paste-up artist might tack a strip of text to the edge of a layout table. The dotted ruler guides aid in positioning and aligning elements, and the Styles palette lets you assign style sheets to text. The icons in the lower-left corner allow you to access other pages in the publication. The icons labeled L and R correspond to left and right master pages, which hold page numbers and other elements that appear on each page.

ReadySetGo 4.5a ReadySetGo used to be Letraset's flagship, but when the firm released DesignStudio, it recast ReadySetGo as a dinghy, lowering its price to \$295. ReadySetGo does provide some advanced features missing from other programs in its price range—a glossary for entering often-used text, relatively fine kerning, style sheets that include tabs and paragraph formatting, and a thumbnail window that lets you reorganize pages by dragging them.

But ReadySetGo cannot directly import files from WordPerfect for the Macintosh 2.0 and Microsoft Word 4.0. (You can import Word 4.0 files by saving them in Word 3.0 format.) And only nostalgia buffs will enjoy the manuals' references to the Mac 512K. ReadySetGo is an ideal dinghy if your ultimate destination is the DesignStudio flagship—they work similarly, and DesignStudio can convert ReadySetGo documents. If not, think twice.

MaxPage 1.2 MinPage would be a better name for this \$89 bare-bones program. It can't kern or even justify type, publications are limited to a single page, the Undo command doesn't work, and the program has an amateurish feel to it. It does run on a 512K Mac. MaxPage needs a face-lift and more features. I can't recommend it. Version 2.0, which should be shipping when you read this, will sport an improved interface and drawing tools, but still won't justify text.

In the Mainstream

IF ENTRY-LEVEL PROGRAMS ARE FOR publishing apprentices, then PageMaker, QuarkXPress, and DesignStudio are for experts. Although these programs pack some word processing punch, they aren't jacks-of-all-trades, but production tools. All three offer excellent type- and image-adjustment features, precise layout and positioning aids, and support for both spot and process color. (A separate program, such as Aldus PrePrint, is required to color-separate PageMaker files; PrePrint is bundled with PageMaker.) All three also support tracking. Nevertheless, the differences between the top two picks, PageMaker and QuarkXPress, are significant.

PageMaker 4.01 PageMaker (\$795) puts designers in familiar territory, thanks to an on-screen pasteboard and the way the program lets you attach text and graphics without first drawing frames (see "Making Pages").

You can create top-notch type with either program—if you have patience and a typographer's eye. But Page-

Page-Layout Lineup

Products are ranked within each category.

ENTRY-LEVEL PROGRAMS

Aldus Personal Press 1.01 \$299 Personal Press does what a low-end publishing program should: it streamlines publishing for nonpublishers. Even pros may use its AutoCreate feature to automate production of documents whose type doesn't demand finesse. It's also extensible with file import/export modules and scanner drivers.

Timeworks Publish It Easy 2.12 \$249.95 Fast even on the slowest Macs, Publish It Easy sports an everything-including-the-kitchen-sink mix of features that may eliminate having to buy a separate drawing or even database program. But some bugs, incomplete features, and daunting complexity mar this otherwise versatile program.

Letraset USA ReadySetGo \$295 Travel back in time to see what page layout was like in 1988. ReadySetGo's ease of use and strong typography are offset by outdated manuals and the inability to import today's popular file formats.

Applied Systems and Technologies MaxPage 1.2 \$89 The world could use an under-\$100 page-layout program, but this one isn't it. MaxPage is poorly designed and lean on features—even for its price.

MAINSTREAM PROGRAMS

Aldus PageMaker 4.01 \$795 The best typography in its class, solid printing and bookmaking features, and an elegant interface combine to make PageMaker the best all-around mainstream package. Version 4.2 (which should be available when this appears) will add long-overdue extensibility and keyboard positioning and sizing—but will still be limited to one open document at a time.

Quark QuarkXPress 3.0 \$795 QuarkXPress is the program of choice for producing pieces requiring rotated elements or spreads of more than two pages. Sophisticated extensions are available for high-volume production. Publishing acrophobes need not apply—the learning curve is steep—but pros will find power aplenty at the summit.

Letraset USA DesignStudio 2.0 \$795 Mainstream publishing's also-ran, DesignStudio is strong on typography but weak on layout conveniences. Style sheets don't work as they do in most programs, and the interface could use a lift. The program has the hooks to allow for powerful extensions, but to date, only Letraset has produced any.

LONG-DOCUMENT PROGRAMS

Frame Technology FrameMaker 3.0 \$795 Powerful and well designed, FrameMaker is the best choice for scientific and technical publishing. Version 3.0 has a fine table editor, allows manual kerning, and can import and print color images in the Desktop Color Separation format. But its power demands commitment—and a Mac II-class machine.

Ventura Software Ventura Publisher, Macintosh Edition 3.2 \$795 Ventura's technique of linking publications to their original text and graphics files means the source files are always up-to-date. The program is a good choice if you already use Ventura on IBM PCs, but Mac veterans will have to adjust to many idiosyncrasies and should consider FrameMaker instead.

Maker's type controls edge out those provided by QuarkXPress. PageMaker provides five automatic tracking levels versus QuarkXPress's one, giving you easier command of character spacing.

Unlike QuarkXPress, PageMaker doesn't let you edit its kern tracks (you can with third-party software), but it does include well-crafted tracks for 35 PostScript fonts—QuarkXPress doesn't. As for manual kerning, PageMaker offers less precision than QuarkXPress, but the differences show up only in very large type sizes printed on high-resolution imagesetters. Also, QuarkXPress does not let you disable automatic kerning for individual paragraphs; PageMaker does, and lets you control it through style sheets. That is ideal when you want to

automatically kern text in some fonts or elements but not others. PageMaker's ranked hyphenation scheme also allows for better automatic hyphenation, although PageMaker doesn't allow as much control over hyphenation.

Although QuarkXPress's frame approach lends itself to structured documents, PageMaker remains the better program for producing books and manuals, thanks in part to its ability to link separate documents and generate a table of contents and index that spans the group. (Indeed, PageMaker's indexing features are among the best anywhere.) PageMaker's unique word processor-like story editor lets you edit without weaving through a publication's pages. PageMaker also provides a better system of

managing the links between a publication file and the text and graphics files you import into it. That simplifies updating publications when their source files change, and simplifies sending publications to imagesetting service bureaus. *Macworld's* production department has encountered problems with linked PICT and MacPaint format graphics—they occasionally disappear when publications are sent to a publishing service bureau for imagesetting. But at this writing, we don't know whether the problem lies in PageMaker or in Aldus PrePrint.

PageMaker's printing features, manual, and online help also beat their QuarkXPress equivalents. And PageMaker is more reliable than QuarkXPress, thanks in part to its minisave feature, which automatically saves the page you're working on when you switch to another page. PageMaker also supports many popular IBM PC file formats, and is itself available for the PC. (A PC version of QuarkXPress is in the works.)

PageMaker 4.2, which should be available by the time you read this, will allow you to position and resize elements by typing values, as well as fine-tune element positions using the keyboard's arrow keys—conveniences QuarkXPress users have enjoyed for years. Version 4.2, like QuarkXPress 3.1 (due to ship by the time you read this), also will support the subscribe feature of Apple's System 7 software. PageMaker 4.2 will also incorporate the Aldus Additions extension technology and include six add-ons.

QuarkXPress 3.0 QuarkXPress may fall short of PageMaker in some areas of typography and publication management, but it offers many more features for manipulating type and page elements. Some examples: QuarkXPress lets you open numerous documents simultaneously and even drag elements from one to another. It lets you rotate text in .001-degree, not just 90-degree, increments. It lets you rotate graphics, and a library feature lets you save and reuse elements with a mouse click (see "Layout Librarian").

QuarkXPress allows spreads of more than two pages, can cope with rules and boxes of virtually any weight, and lets you apply tints to spot color. Its indent-to-here keyboard shortcut makes short work of aligning numbered or bulleted lists. The program lets you lock elements against being moved or modified. Its Step and Repeat command simplifies creating forms and other structured pages.

QuarkXPress also has the lead where extensibility is concerned. Aldus can

point to a handful of developers that have announced additions, but Quark can show you a catalog of dozens of extensions available now.

QuarkXPress 3.1 will be easier to use than earlier versions, but the program's labyrinth of features, preference settings, and document setup options can still be daunting. PageMaker—my favorite, but by a small margin—is easier to learn and generally feels smoother, if slower. Many publishing professionals buy both programs and apply each one's strengths to the appropriate jobs.

DesignStudio 2.0 There's a lot to like in DesignStudio (\$795), starting with fine type: three tracking levels with editable tracks; paragraph-level automatic kerning; tabs that have not only starting points, but widths as well, making it easier to create specialized tables; and a unique Professional-rag option that creates attractively undulating ragged margins.

As for layout, DesignStudio uses frames similar to QuarkXPress's and allows you to position and resize items using the keyboard or mouse. The program can also display a customizable row-and-column grid, but oddly, does not let you display the grid and ruler guides simultaneously.

DesignStudio has many such blemishes. It doesn't provide adequate feedback when you're linking text frames. There's no ruler for setting paragraph indents; you must type values in a dialog box. It lacks its competitors' convenient floating windows for assigning colors and styles and for sizing and positioning elements. And its approach to style sheets is annoying—you can't apply a style to already-formatted type without losing the previous formatting, and you can't format styled type without first removing the style. And many aspects of the program are rough around the edges. DesignStudio is a promising program, but Letraset needs to revamp the style sheets and polish the interface.

Letraset is currently working on a maintenance upgrade, tentatively called version 2.5, that adds System 7 support, including TrueType support, a Subscribe command, balloon help, and support for AppleEvents. The new version will also be able to print to non-PostScript printers (version 2.0 doesn't), and will, according to Letraset, run faster and use memory more efficiently. It will also support Apple's QuickTime and will be able to play back QuickTime movies located on pasteboard—Johannes Gutenberg meets Max Headroom. The update is scheduled to be available in the first quarter of 1992.

When the Going Gets Long

LONG-DOCUMENT PROGRAMS ARE DESIGNED for publishing books and manuals, especially for technical or scientific subjects. Such programs can generate tables of contents, indexes, lists of figures, footnotes, and tables; and can automatically update page numbers in cross-references as a document's page breaks change (as in "see 'word' on page 2"). They can place vertical bars alongside text that has been edited since the last revision, aiding in the document-review process. They have built-in equation editors, table editors, and drawing tools.

FrameMaker also lets you create electronic publications with HyperCard-like on-screen hot spots where you click to display more information or jump to other sections. Interleaf Corporation's Interleaf Publisher 5.0 is scheduled to ship in mid-1992 and includes a programming language that enables docu-



Layout Librarian QuarkXPress's innovative library feature lets you store and recall often-used text or graphics. Retrieving an element from the library is a simple matter of dragging it from the library window (here called Maryellen's Tidbits) onto the page. Also visible here is QuarkXPress's Document Layout palette, which lets you rearrange and quickly access a publication's pages. The measurements palette at bottom displays information about the selected element and lets you conveniently modify its position, text, and other attributes.



The FrameMaker Way FrameMaker lets you automate document construction by predefining character and paragraph formats, and then using the catalog palettes to assign formats. The document at top shows an automatically numbered (here, lettered) list and a table created with FrameMaker's table editor. FrameMaker's drawing tools created the table's graphics.

ments to tailor themselves to the need at hand. For example, an on-screen service manual might show different troubleshooting diagrams depending on the problem reported by a diagnostic device.

Long-document programs require more planning and setup time than do other publishing programs, as well as a department- or company-wide commitment to their structured approach. But if you make the effort, these programs let you create and update large, complex publications with an ease other programs don't provide.

The top program in this group—FrameMaker—wraps its power within an approachable interface backed by excellent documentation. (Interleaf 5.0 will offer some features FrameMaker lacks, including built-in graphing, publish and subscribe support, and active-document architecture. Interleaf Publisher 3.6 is available but does not offer a standard Mac interface and is better suited for workstations. I don't recommend it.)

FrameMaker 3.0 In FrameMaker, a designer or production artist first creates a template describing a document's appearance and containing style sheets (called formats) for character and paragraph formatting. The style sheets go well beyond those of popular word processors, incorporating such details as whether paragraphs should be numbered or bulleted according to one of dozens of schemes.

Then, writers use FrameMaker to write the publication, choosing the predefined styles from palettes and adding index and table-of-contents entries, cross-references, equations, and the like, as they work (see "The FrameMaker Way"). Meanwhile, artists might use FrameMaker's drawing tools to create *technical* illustrations or diagrams. Revisions are easier because there are no separate word processing and graphics files to modify and import. All this occurs on a network (and one that may encompass high-end workstations for which FrameMaker is also available) that allows people to collaborate on publications stored on a central file server.

FrameMaker 3.0 addresses many of version 2.1's shortcomings. FrameMaker now sports a powerful table editor, it imports Microsoft Word style sheets more accurately, and it can import text into an existing document. FrameMaker now offers manual kerning and can import and print color images in the Desktop Color Separation format.

Version 3.0 adds a powerful new formatting attribute called *conditional text*. This lets you create different versions of a document from a single base

document—for example, domestic and international versions of a catalog with price and shipping information for each, or student and teacher versions of a textbook. FrameMaker lacks some of the space-age features Interleaf Publisher will offer when it releases version 5.0, but its conditional text and hypertext links make it a powerful electronic publishing tool. It's a superb program.

Ventura Publisher, Macintosh Edition

3.0.1 With Ventura, instead of importing text and graphics into a publication, you establish links between the publication file and original text and graphics documents. When you change those original files, the publication is updated. Therefore, Ventura doesn't need the heavy-duty word processing and drawing features of FrameMaker and Interleaf Publisher. Ventura also lacks conditional text and hypertext features, although it provides excellent table and equation editors and better typographic controls than its competitors. Ventura 3.2, due out by the time you read this, adds support for Apple's System 7, including publish and subscribe commands.

Ventura began life on IBM PCs, and that heritage shows up in the Mac version. Many things don't work the way a Mac veteran would expect them to, and that can be frustrating. But its PC heritage means Ventura supports numerous PC text and graphics file formats, and it can swap publications with its PC counterpart. Offices already using Ventura on PCs might consider the Mac version; otherwise, I recommend FrameMaker.

Other Choices

PUBLISHING FEATURES ARE SURFACING in many programs, and depending on your needs, the best program for publishing might not be a publishing program. If fine type control and support for a wide range of graphics formats aren't important, you might consider a word processor or integrated package. Numerous word processors let you draw and import graphics and create multicolumn layouts (see "Write—or Wrong?", *Macworld*, September 1991). Integrated programs such as Microsoft Works, Symantec's GreatWorks, Beagle Bros' BeagleWorks, RagTime USA's RagTime Classic and RagTime III, and Claris's ClarisWorks have the convenience edge if you're creating reports containing information from a spreadsheet or database. (At this writing, only Microsoft Works and the RagTime series are shipping.)

And illustration programs such as Aldus FreeHand and Adobe Illustrator

MW

EDITORS' CHOICE

Entry-Level Program

Personal Press This program is easy to use, yet offers a wide array of features, including automatically creating documents within preset templates. **Company:** Aldus Corporation. **List price:** \$299.

Mainstream Program

PageMaker In a close race with QuarkXPress, PageMaker gets the nod with such standout features as minisave (which automatically saves the page you're working on when you switch to another page), superior indexing, and links between documents. **Company:** Aldus Corporation. **List price:** \$795.

Long-Document Program

FrameMaker This program outshines the competition with an excellent table editor, style sheets that improve on those of popular word processors, and *conditional text*—a feature that lets you create different versions of a document from a single base document. **Company:** Frame Technology. **List price:** \$795.

are ideal for creating small, graphically oriented publications, especially ones requiring special typographic effects. Illustrator 3.0 handles text particularly well, even allowing you to link frames so that text flows from one to another.

Then there's Multi-Ad Services' \$895 Multi-Ad Creator, which lets you create documents containing numerous versions of a single page. With its PageMaker-like place-and-go layout scheme, built-in library of PostScript text special effects, and superb style-sheet features, it's an excellent choice for producing single-page publications, especially display ads.

In the diversifying world of desktop publishing, PageMaker and QuarkXPress will remain the preeminent programs—and deservedly so. Still, it's good to see the market expand to encompass novices as well as professionals with specialized requirements. After all, the printed word can take many forms, and no single program can handle all of them. **m**

See *Where to Buy* for contact information.

Contributing editor and Getting Started columnist JIM HEID is a former typographer and the author of Macworld Complete Mac Handbook (IDG Books Worldwide, 1991). He has also designed and produced quick-reference cards for several IDG books.

Enhancing Page Layout

CUSTOMIZE

YOUR

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WITH THESE

UTILITIES

AND ADD-ONS

BY JIM HEID

NO PROGRAM CAN BE ALL things to all people. That truism is the driving force behind one of the most recent trends in desktop publishing software: *extensibility*. Just as you can enhance your Macintosh with plug-in boards and external add-ons, you can improve old desktop-publishing features or add new ones through software that plugs into or works alongside a publishing program.

Although Aldus began offering layout templates shortly after PageMaker debuted, Quark pioneered the trend to the customized publishing environment in 1989 when it introduced Xtensions. Letraset followed Quark's lead when it introduced DesignStudio, whose software add-ons are called Annexes. Aldus joined the fray when it recently announced its Aldus Additions technology, which debuts in PageMaker 4.2, scheduled to ship by the time you read this.

To understand why extensibility is desirable in publishing software, consider any large publishing department. Of course it has typesetters and pasteup artists, but it also needs specialists for each publishing niche: Darkroom technicians prepare the publication's images. Proofreaders and editorial assistants check spelling and compile indexes. Research assistants cull information from databases and wire-service reports. Managing editors monitor the big picture and shepherd stories through the production process. Advertising coordinators sell, track, and manage ad space. Strippers integrate the elements of each page on film—text, graphics, photographs—and then organize those pages so that they're in the correct order after being printed,

cut, folded, and bound. An equivalent publishing add-on exists for every one of these job specialties—if you use QuarkXPress, that is.

Over 60 extensions and stand-alone utilities are available for QuarkXPress. Roughly a dozen additions should be shipping for PageMaker by the time you read this; Aldus estimates at least 50 more will be shipping by mid-1992. Only a few annexes are offered for DesignStudio, all created by Letraset, and all but one (a tool for automating the creation of publications) bundled with DesignStudio. (Bundled annexes improve hyphenation and enable you to edit kerning and tracking tables, perform color separations, and create lists of fonts or pictures.) Letraset has just opened DesignStudio's annex technology to outside developers; time will tell whether the program, the least popular of the three, will attract them in significant numbers.

For now, at least, Quark and Aldus are the major players in mainstream publishing extensibility. (Other publishing programs are extensible to lesser degrees, allowing you to add file import/export filters, foreign-language spelling-checker dictionaries, and scanner drivers.) When you choose between PageMaker and QuarkXPress, you're also buying into an extensibility technology. Understanding how those technologies differ may help you choose the one that can grow to meet your specific needs.

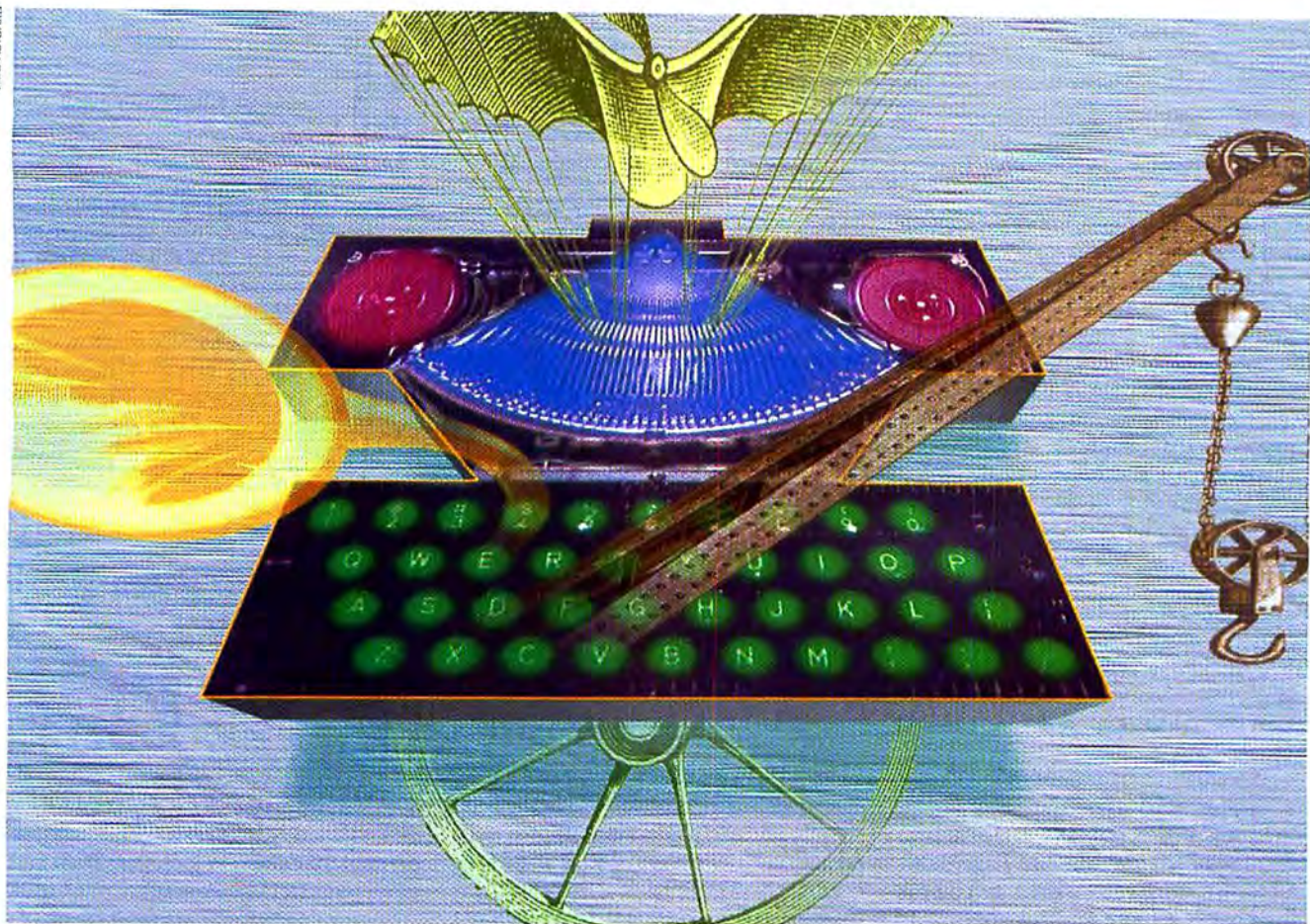
How Software Add-Ons Work

UNLIKE EXPANDING A MAC, EXPANDING a publishing program involves no slots or static-sensitive circuit boards. To install a utility, simply copy it to a special folder on your hard drive. When you start the publishing program, it examines the folder containing the utility and loads

the add-ons it finds. The names of the add-ons appear in one or more of the program's menus.

Beyond these basics, however, the programs' underlying approaches to extensibility diverge. Quark's Xtensions technology allows extensions to tap into QuarkXPress's software code. Quark provides dozens of software routines that extensions developers use to create dialog boxes and manipulate style sheets, ruler guides, text and picture boxes and their contents, menus—every aspect of QuarkXPress. Extensions can add commands to any QuarkXPress menu, and those commands can be dimmed (made unavailable) when it wouldn't make sense to choose them. Extensions can display floating tool palettes that are always available and that operate like QuarkXPress's own palettes. In short, extensions can weave themselves into QuarkXPress and become part of it.

Because extensions are intimately tied to QuarkXPress, however, compatibility problems often arise when Quark releases a new version of the program. Quark acknowledges this, but says many developers revise their extensions any-



way in order to exploit the new features that a new version of QuarkXPress provides. Some extension developers I talked to agreed, but many said the need to keep pace with Quark means more work for them and more inconvenience for their customers. For consumers, the lesson is clear: before buying an extension, verify that it works with your version of QuarkXPress.

Aldus aims to avoid this problem by putting some distance between PageMaker and its additions. Instead of granting developers access to PageMaker's code, Aldus has created what it calls the interface manager, a go-between that allows additions to interact with PageMaker through two text-based languages. One language comprises commands: put a ruler guide at the 3-inch vertical mark, create a new tabloid-size document, import a file, and so on. The other language handles queries: What font does the selected text use? Where is the ruler's current zero point? What are the current tracking settings? Both languages are fairly easy to understand because they're derived from PageMaker's menu commands and mouse actions.

Essential Differences

BUT THE PROBLEM WITH COMPUTER languages is that they have finite vocabularies. A PageMaker addition can't make PageMaker do anything that PageMaker doesn't already know how to do. Imagine the Aldus Additions technology as a set of wires leading to a puppet's limbs. Now imagine Quark's Xtension technology as both providing those wires and allowing developers to add entirely new limbs.

This isn't to say that Additions can't make PageMaker do new things. They can, but ultimately additions rely on the command and query languages to put their efforts on PageMaker's pasteboard.

Consider the Sort Pages addition that will accompany PageMaker 4.2: Sort Pages lets you reorganize pages by dragging icons within a window—certainly a new feature. When you close the window, the addition uses PageMaker's command and query languages to insert and delete pages and cut and paste as needed to reorganize the publication. The Sort Pages addition doesn't teach PageMaker how to sort pages; it simply uses the Aldus Additions mechanism to

automate the grueling process of inserting, deleting, cutting, and pasting.

A more direct limitation of Aldus Additions is that an addition must complete its work before you can return to the publication window. Thus you won't see additions that provide floating tool palettes that are always available (as with many Quark Xtensions). Nor does the Aldus Additions mechanism allow an addition to appear in any PageMaker menu—all additions appear in the Aldus Additions submenu (in the Options menu). Finally, an addition's name cannot be dimmed when the addition isn't relevant. For example, it wouldn't make sense to choose the Drop Cap addition (bundled with PageMaker) when you have a graphic selected. This bends Apple's rules for how Mac programs are supposed to work.

Additional Advantages

BUT THE ALDUS ADDITIONS MECHANISM also has some significant advantages over the Xtension technology. You can create your own additions by writing scripts in PageMaker's command language. Want to automate a repetitive

task? Type a script on PageMaker's pasteboard or in its story editor, then select the script and choose the Run Script command (see "PageMaker on Autopilot"). PageMaker hackers will litter their pasteboards with time-saving scripts that make fractions, apply kerning, shift baselines, reflow text, import files, and much more. Expect to see script collections appearing in user group libraries and online services.

Additions technology also enables different applications to work together with PageMaker. Using AppleEvents, the interapplication communication (IAC) mechanism in System 7, PageMaker can exchange messages and data with other programs that support AppleEvents. PageMaker 4.2 and Aldus's forthcoming FreeHand 3.1 (due to ship by the end of 1991) illustrate how handy this can be: if you press the option key while clicking on an imported FreeHand illustration, PageMaker starts FreeHand 3.1 and opens the illustration. When you've finished modifying the illustration in FreeHand, PageMaker imports the new version. QuarkXPress doesn't support AppleEvents.

Developers can also use AppleEvents to control PageMaker from separate applications. For example, a database program might shuttle data into PageMaker and format it to create a catalog. You can also create remote-control macros in Microsoft Excel 3.0, HyperCard, and other AppleEvents-capable programs.

As mentioned earlier, Aldus says PageMaker's interface manager will shield commercial additions from the new-version compatibility problems that occur in the QuarkXPress world. We

shall see. Aldus also says the interface manager makes it easier for developers to create additions for both the Mac and DOS PC versions of PageMaker. This, too, remains to be seen, although it's true that having identical command and query languages on the Mac and DOS PC should streamline the process. At this writing, the DOS PC version of QuarkXPress is still in development, and it isn't clear how easy it will be for Quark extensions developers to convert their wares to the PC version.

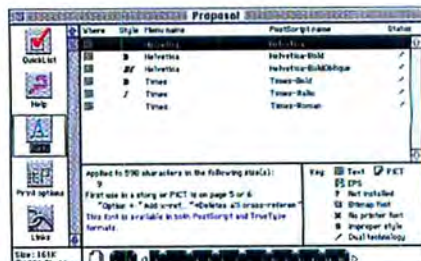
Shopping for Add-Ons

"UTILITY DIRECTORY" LISTS EXTENSIONS, additions, and annexes that are available for QuarkXPress, PageMaker, and DesignStudio. Quark also publishes a detailed extensions directory free on request. Many extensions are developed by small software shops that aren't equipped to take orders and ship products. The best source for purchasing extensions is San Francisco-based XChange (415/337-0102, 800/788-7557). The firm also puts publishing companies seeking customized extensions in touch with free-lance programmers.

So who wins the extensibility contest? For sheer numbers, Quark. Whether you want to create complex impositions, track ad placement, customize style sheets, or create crossword puzzles, there's an extension for the job. The large selection of top-quality extensions makes QuarkXPress the most versatile publishing program available.

Many extensions are geared toward high-end pagination and publication management, giving QuarkXPress additional appeal for newspaper and periodical publishing. This appeal may grow when Quark releases QuarkCopyDesk, a \$17,000 editorial- and production-management system that, among many other things, Quark says, will enable editors to write and file stories that are stored on a central file server, where they can be imported into QuarkXPress. QuarkCopyDesk will use new software, QuarkDispatch, to provide routines developers can use to write programs that enable users to log into and out of a network publishing system, track story revision histories, and more. These products are both scheduled for delivery in the second quarter of 1992.

Quark has the edge in numbers, but whose extensi-



ElseWare CheckList If you send publications to service bureaus, consider this \$179.95 program. CheckList scans a PageMaker publication (or a printed-to-disk PostScript file) and reports on the fonts it uses, the text and graphics files it contains, the print options specified for it, and much more. You can even compress the publication and its source files. An older version of CheckList is distributed as shareware through user groups and online services. (For a review of CheckList, see *Reviews*, this issue.)



Advanced Separations By itself, QuarkXPress can't color-separate continuous-tone images. With PrePress Technologies' \$495 SpectreSeeps QX, it can. This X-tension also enables you to color-correct an image to compensate for the somewhat inaccurate colors generated by color scanners. The Range pop-up menu lets you define the image's overall tonal range (the difference between highlight and shadow densities), the Gradation pop-up allows you to lighten and darken images, and the Sharpness pop-up lets you sharpen and blur images.

bility technology is the best? That's a tough call, but based on the preliminary information available at this writing, I give a slight edge to Aldus. The first generation of the Aldus Additions technology limits what additions can do, and it still remains to be seen whether going through PageMaker's interface manager will make additions slower than extensions that perform equivalent tasks—especially since PageMaker is already generally slower than QuarkXPress.

But because additions are insulated from PageMaker's underlying code they should be less prone to compatibility problems. Moreover, Aldus Additions' AppleEvents support lays the foundation for links between PageMaker and other programs. Besides simplifying the process of moving information into and out of PageMaker and updating source files

PageMaker on Autopilot

This Aldus Additions script shows how you might use scripts to automate the production of a weekly status report. The text following each set of double hyphens are comments that describe each statement's purpose.

```
new--create a new publication
pagesize 8.5, 11--make it an 8.5 by 11 inches, tall
pageoptions off,off--turn off double-sided, facing pages
pagemargins 1, 1.5, 1, 1--set page margins
page RM--go to right master page
guidehoriz 1.5--make ruler guide 1.5 in from page top
linestyle thickthin--use double-rule, thick/thin line style
line (1,1),(7.5,1)--draw a line across top of page
line (1,10),(7.5,10)--draw a line across bottom of page
page 1--go to first page
autoflow on--turn Autoflow on
import "report"--import file named "report"
place (column 1 left, 1.5)--place it starting at col. 1
```


UTILITY DIRECTORY

Product Name	Price	Description
DESIGNSTUDIO ANNEXES		
DesignScript	\$125.00	Automates publication creation using coded text files
PAGEMAKER ADDITIONS AND UTILITIES		
Aldus PrePrint	1	Color-separates files from PageMaker and other programs
CheckList	\$179.95	Streamlines sending publications to service bureaus
DataShaper	\$179.95	Automates production of publications containing information from a spreadsheet or database
PageMaker Dictionaries	\$89.00	Adds foreign-language legal, medical, and scientific dictionaries
PrinterTracker	\$99.00	Edits PageMaker's kern tracks
Tableau	\$495.00	Manages and imports classified ads
Table Editor	1	Creates tables for importing into PageMaker
QUARKXPRESS XTENSIONS		
Advertising Advantage	\$495.00	Generates ads and tracks ad co-op billing rebates for retail stores
Agfa XPress Scan	\$550.00	Controls Agfa ACS100 and Focus scanners from QuarkXPress
At/Cu	\$20.00	Adds moving eyeballs to QuarkXPress dialog boxes
Atan Express	\$5000.00	Connects QuarkXPress to Aten systems
AutoPage	\$6100.00	Automates book, manual, technical document construction
BureauExpress	free	Compresses/transmits publications to BureauMaster-based sites
ClassManager	\$2495.00	Provides billing, order entry, tracking of classified ads
ClassManager/Plus	\$2995.00	Same as Class Manager but adds classified ad layout features
ColorSnap 32+	\$995.00	Captures 24-bit color images from any video source
CommLink/Plus	\$995.00	Links Mac to dedicated typesetters via RS-232C interface
CopyBridge	\$1500.00	Translates XyWrite styles and documents to QuarkXPress format
CopyFlow	\$395.00	Streamlines importing large numbers of text or graphics files
CopyFlow Reports	\$225.00	Reports relationship between source files and publication
Copy Specs	\$30.00	Allows copying and pasting of text formatting attributes
Dashes XTension	\$200.00	Provides dictionary- and algorithm-based hyphenation
MacStep-Flexo Step & Repeat	\$4695.00	Repeats publication files for label and tag printing
GrafIXChange	\$295.00	Imports IBM PC graphics file formats
Grid Layout	\$24.95	Simplifies creating layout grids
Grids&Guides	\$49.95	Streamlines QuarkXPress grid and ruler-guide features
Keyliner	\$2500.00	Provides high-end stripping features
MakeBooklet	2	Organizes pages for saddle-stitch binding
MS Word XTensions	\$295.00	Imports files from PC version of Microsoft Word
Mycro-Comp Page	\$49.95	Automates production of editorial and classified ad sections
NewsEdit	\$375.00	Text editor with copy-management features
NewsLink	\$1500.00	Builds pages from stories stored on SunType Editorial System
Overset	\$69.00	Creates temporary text box for overset text
Page Director	\$1495.00	Automates production of newspapers and other periodicals
Palos	1	Automates layout of color publications; includes image-capture software and multiuser image database
PinPointXT	\$79.50	Reports PostScript printer errors, aids in troubleshooting
Printer's Spreads	\$179.00	Creates impositions for saddle-stitched publications
Professional Catalog Link	\$4995.00	Links QuarkXPress to mainframe databases to verify prices
Publication Locking	\$295.00	Enables page elements to be locked according to various criteria
The Puzzler	\$495.00	Generates crossword puzzles
QSpool	\$495.00	Adds print-spooling features (works with NewsEdit)
QTools	\$195.00	Provides copyfitting utilities and generates jump and runover lines
QXEdit	\$149.00	Adds story editor window to QuarkXPress
Resize XT	\$40.00	Allows percentage scaling of text and graphics boxes and lines
SCS/Link	\$2750.00	Builds newspaper pages mixing editorial and advertisements
Service Bureau XTension	\$395.00	Reports on fonts, linked graphics, other publication features
SetInset	free	Allows setting of different text inset values for all sides of text box
SetSnap	free	Allows customizing of guide snap-to sensitivity
SignMaker	2	Generates retail store signs
Sonar Bookends	\$129.95	Generates tables of contents and indexes

For contact information on shipping products, see *Where to Buy*. ¹ Included with PageMaker. ² Contact company for pricing information.

as a publication evolves, AppleEvents support will make possible powerful stand-alone additions that handle specialized publishing tasks.

And the Aldus Additions scripting language is a strong asset that will enable all PageMaker users to extend Page-

Maker in ways that will streamline their own work. To many users, scripts may be the most useful aspect of PageMaker 4.2's extensibility. After all, to extend a program is to customize it to meet your particular needs, and no one knows those needs better than you. **m**

Product Name	Price	Description
Sonar TOC	\$99.95	Generates tables of contents (requires Sonar Bookends)
SpectreScan QX	\$295.00	Controls popular scanners from within QuarkXPress
SpectreSepp QX	\$495.00	Enhances QuarkXPress's process color separation features
SpellBound XTension	\$200.00	Checks spelling
StylePro	\$49.95	Adds Style palette to QuarkXPress
Tableau	\$495.00	Manages and inserts classified ads
Tableworks	\$299.00	Adds table-editing features to QuarkXPress
Thesaurus reX	\$69.00	Adds online thesaurus
TimeStamp	\$30.00	Stamps documents with date and time of last revision
TMS Express	1	Connects QuarkXPress to TMS/EMS systems
TransTags	\$495.00	Converts coded files from dedicated typesetting systems
Visionary/Q	1	Creates databases, fractions, and more for Scitex imaging equipment
Wang WP/PC XTensions	\$395.00	Imports files from Wang word processors
WireManager	\$1895.00	Collects wire service stories and stores on hard drive
WordPerfect XTensions	\$295.00	Imports files from PC version of WordPerfect
Xdata	\$295.00	Automates production of directories and other publications containing information from a database manager
XMacro	\$650.00	Translates coded files into QuarkXPress format
XSize	\$325.00	Simplifies picture resizing
Xstyle	\$79.00	Adds style-editing palette to QuarkXPress

NON-SHIPING

Product	Price	Description (Contact Information)
QUARKXPRESS XTENSIONS		
AdLink	\$2500.00	Provides multiuser database for production and placement of display ads (Synaptic Micro Solutions, 800/526-6547)
Default Settings	\$49.95	Customizes interface (a lowly apprentice production, 619/459-7655)
DigiMac	2	Connects QuarkXPress to DigiDesign prepress systems (MacMecharna AB, 011 46/40-758-00)
ImageBase	2	Builds photographic databases, tracks use of photos (MacMecharna AB, 011 46/40-758-00)
INposition	\$1750.00	Creates impositions (David King & Associates, 619/488-8118)
InsertSpace	\$49.00	Optically centers text (XTend, 908/821-6400)
PINK Press	2	Provides multiuser text-editing, page production, and publication administration (PINK America, 212/522-7465)
ProPublisher	\$75.00	Automates tasks with function keys (XChange, 415/864-7592)
XMacro	2	Translates coded files into Quark format (XChange, 415/864-7592)
XSize	2	Simplifies picture resizing (XChange, 415/864-7592)
XTension Manager	\$69.95	Enables/disables XTensions (David King & Associates, 619/488-8118)
PAGEMAKER ADDITIONS AND UTILITIES		
BureauExpressPM	free	Compresses/transmits publications to BureauMaster-based service bureaus (Compumation, 814/238-2120)
Graphics Import and Rotation	2	Rotates/flips graphics in formats that can be imported by PageMaker, as well as other formats (Equilibrium, 415/457-6333)
PagePort	\$129.00	Opens multiple publication files and enables movement of elements between pages (Altura Software, 408/655-8005)
PMcopyFit	2	Adds vertical justification and copyfitting features (EDCO Services, 813/962-7800, 800/523-8973)
PMproKit	2	Enhances tabs, text rotation, kerning, tracking, and more (EDCO Services, 800/523-8973)
PMproPages	2	Imports coded files from dedicated typesetting systems (EDCO Services, 800/523-8973)
Rotation	2	Rotates/flips graphics in formats that can be imported by PageMaker (Equilibrium, 415/457-6333)
Visionary1A	2	Creates grids, databases, fractions, and more for Scitex imaging equipment (Scitex Graphic Arts User Group, 615/366-1798)

See *Where To Buy* under DTP Utilities for contact information.

Contributing editor JIM HEID is a former typographer and the author of *Macworld Complete Mac Handbook* (IDG Books Worldwide, 1991), an expanded, updated collection of his *Getting Started* columns.

Seeking Midrange HARD DRIVES

Weighing Performance Factors

THERE'S MORE TO DRIVE PERFORMANCE than raw speed. For each task performed—mostly standard Macintosh functions, such as launching applications, saving files, and searching databases—Macworld Lab recorded how long the various operations within a task take: the central processing unit (CPU) selecting the drive, the drive receiving commands, the drive receiving and sending data, and the drive releasing the bus back to the CPU, for example. The lab staff distinguished between *CPU time* (the time taken up by operations that rely solely on the CPU) and *disk-access time* (the time used by operations that involve the hard drive itself and SCSI communication between the drive and the CPU).

Separating the two types of access time is important because disk-access time

**Macworld Lab
tests 44 external
hard drives from
120MB to 220MB**

BY BRUCE F. WEBSTER

You may be startled to realize that *mid-range* for hard drives now means between 120 and 220 megabytes of storage—especially since the largest (and only) external hard drive Apple sells holds just

80MB. But such is the case. Increasing capacities; decreasing costs; and the ballooning size of system software, applications, and data files have combined to shift the midrange definition, which just a few years ago was 40MB to 80MB. No doubt, it will

continue to shift upward.

Get as much space as you can afford. It's my observation that most hard drives tend to reach equilibrium at around 90 percent of their capacity, which means that if you purchase a 200MB hard drive, after several months you will find yourself with 180MB of applications, images, data, sound, fonts, utilities, games, and so on. At that point you start wishing you'd purchased a larger drive—so you might as well buy the largest drive you can afford in the first place.

You may also be startled to realize that the price for a 200MB to 210MB hard drive can range from \$659 (the Club Mac 207MB) to \$1799 (the Rodime Systems Cobra)—with drives at both ends of the price range using the exact same drive mechanism.

is what you as a buyer can use to determine which hard drive will work fastest for you. If you have a Mac Classic, there is little point in picking one of these hard drives based on disk access speed, since the Classic's slow (8MHz 68000) CPU and SCSI interface are the limiting factors on performance of most hard drive operations. But if you're getting a Quadra 700 or 900—with a 25MHz 68040 CPU and a hopped-up SCSI interface—you may well want one of the drives with the fastest access times, since the *drive's performance* will be the limiting factor most of the time.

If you have a relatively fast Mac like a II, the most important speed factor is the kind of disk access you are doing. Some tasks, like loading a Microsoft Excel file, use little disk-access time, while others, like duplicating files, use a lot of disk access time. To help you gauge your needs, see "When Disk Speed Matters."

The formatting software you use can also make a difference. For example, we formatted the Total Peripherals 210MB drive first with the software that came with the drive, and then with Club Mac's SCSI Director software. When formatted with SCSI Director, the drive was at least 10 percent faster.

The version of a drive's ROM can have a similar effect: both the FWB PocketHammer200 and MacProducts USA MagicDrive drives use Quantum PD



Speed Demons No matter your price range or desired capacity, you'll find a fast drive. In our tests, the MacTel Technology Index 210, GCC Technologies UltraDrive 175S, and FWB PocketHammer200 (top to bottom) clocked in as the fastest.

210 mechanisms, and we formatted them with the same software, but the FWB was at least 10 percent faster. Why? The FWB uses a later version of Quantum's ROM: 527 versus 501C.

The overall speed difference between the fastest drive (FWB PocketHammer200) and the slowest drive (Relax Vista 180) is about 35 percent. This

means that a task that takes 13 seconds with the PocketHammer200 will take about 20 seconds on the Vista 180. While that 35 percent difference may be significant if you deal with large files (such as graphic images) or heavy disk access (such as program compilation or page swapping), it is insignificant in casual, everyday use. What's more, most drives

tested scored within about 10 percent of the fastest drive—in other words, they had at least 90 percent of the speed of the PocketHammer200. And drives from the same assembly line vary 2 or 3 percent from each other because of manufacturing differences.

With the small speed differences among most drives' mechanisms, it's easy

HARD DRIVE DETAILS

Company	Product	120-130MB Drives (capacity/mechanism/price)	140-180MB Drives (capacity/mechanism/price)	200-220MB Drives (capacity/mechanism/price)	Sales Method	Dimensions	Termination	Connectors	Universal Power Supply	Backup Software
APS	APS	120/M/\$439	170/Q/\$589	200/M/\$689; 210/Q/\$699	dealer, direct	2.8 x 9.5 x 9.7	ext.	50-pin	●	○
CD Technology	HD Porta-Drive	○	○	200/C/\$1595	dealer	2 x 6.8 x 8.3	ext.	50-pin	●	○
Club Mac	Club Mac	120/Q/\$589	170/Q/\$609	207/M/\$659; 210/Q/\$709; 220/HP/\$799	direct	2 x 10 x 10	int.	50-pin	●	○
CMS Enhancements	Platinum	○	○	200/WD/\$1499	dealer	2 x 10 x 10.5	ext.	50-pin	●	●
Core International	Optima 200	○	○	220/HP/\$1429	dealer	2.3 x 6.8 x 8.4	ext.	50-pin	●	●
Cutting Edge	Cutting Edge	○	170/Q/\$1169	210/Q/\$1279	dealer	2.3 x 9.8 x 10.4	int.	50-pin	●	●
Deltaic Systems	Server	○	○	210/Q/\$749	dealer, direct	2.5 x 9.7 x 9.7	ext.	50-pin	●	○
DJK Development	DJK	○	○	213/M/\$959	direct	2.5 x 9.8 x 9.8	ext.	50-pin	●	●
Ehman	Ehman	○	170/Q/\$729	210/Q/\$749	direct	2.3 x 9.8 x 10.4	int.	50-pin	●	●
ETC Peripherals	DataPort	120/M/\$714	170/Q/\$936	210/M/\$1011	dealer	2.8 x 9.8 x 9.8	ext.	50-pin	●	○
FWB	PocketHammer200	○	○	200/Q/\$1799	dealer	3 x 6.5 x 9	ext.	50-pin	●	○
GCC Technologies	UltraDrive	○	175S/CDC/\$1399	○	dealer, direct	2.8 x 9.5 x 10.7	switchable	50-pin	●	●
Hard Drives International	PowerDrive	○	○	210/Q/\$698; 213/M/\$679	direct	2.5 x 10 x 10	int.	50-pin	●	○
La Cie	Cirrus	120/Q/\$679	170/Q/\$799	210/Q/\$879	direct	3 x 6 x 9	switchable	25-pin	●	●
La Cie	Tsunami	120/Q/\$729	170/Q/\$849	210/Q/\$929	direct	6 x 2.8 x 8	switchable	25-pin	●	●
La Cie	ZFP	120/Q/\$579	170/Q/\$699	210/Q/\$779	direct	9.75 x 9.75 x 2.4	switchable	25-pin	●	●
Liberty Systems	Liberty 50 series	120/Q/\$999	○	○	direct	1.9 x 4 x 7	int.	25-pin	optional	○
Liberty Systems	Liberty 70 series	○	170/Q/\$1199	210/Q/\$1299	direct	2 x 5 x 7	int.	25-pin	optional	○
MacProducts USA	MagicDrive	○	170/Q/\$699; 170/CDC/\$999	210/Q/\$799	dealer, direct	2.5 x 9.9 x 9.3	int. or ext.	50-pin	●	○
MacTel Technology Corporation	Index	○	○	210/Q/\$699	direct	2.5 x 10.2 x 10.2	ext.	25- or 50-pin	●	●
Mass Microsystems	DiamondDrive	130/M/\$1079	○	213/M/\$2549	dealer	2.7 x 9.8 x 10	ext.	50-pin	●	○
MicroNet Technology	MS	○	173/S/\$1849	200/M/\$1445	dealer	2.5 x 9.8 x 10.5	ext.	50-pin	●	○
Microtech International	Microtech	○	○	200/Q/\$1699	dealer	2.5 x 9.5 x 10.5	ext.	50-pin	●	●
Mirror Technologies	Mirror	○	○	210/Q/\$829	direct	2.5 x 9.8 x 10.8	ext.	50-pin	●	●
Optima Technology Corporation	MiniPak	130/U/\$1395	○	200/U/\$1795	dealer	2.5 x 6.2 x 7.8	ext.	50-pin	●	○
Optima Technology Corporation	DisKovery	130/U/\$1395	○	200/U/\$1795	dealer	2.5 x 11.4 x 10.2	ext.	50-pin	●	○
Peripheral Vision Storage	PV	○	○	200/Q/\$749	direct	2.5 x 9.5 x 9.8	switchable	50-pin	●	○
PLI	PL Turbo	○	○	200/Q/\$1199	dealer, direct	2.4 x 9.8 x 9.8	switchable	50-pin	optional	●
Procom Technology	Procom	○	○	210/Q/\$1550	dealer	2.5 x 9.5 x 10.5	ext.	50-pin	●	○
Relax Technology	Vista	○	180/F/\$659	210/Q/\$699	direct	2.3 x 10.2 x 10.2	ext.	50-pin	●	○
Rodime Systems	Cobra	○	120/M/\$1229	210/M/\$1799	dealer	2.4 x 9.7 x 10.4	int.	50-pin	●	●
Storage Dimensions	MacinStor ZFP	120/M/\$1009	○	205/M/\$1609	dealer	2.3 x 9.7 x 10.5	ext.	50-pin	●	○
Third Wave Computing	Third Wave	○	○	210/Q/\$759	dealer, direct	2.5 x 9.8 x 9.8	ext.	50-pin	●	○
Total Peripherals	TP	○	170/Q/\$829	210/Q/\$929	dealer	3.3 x 10 x 10.5	int.	50-pin	●	○

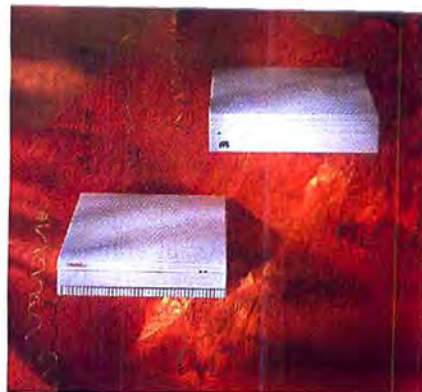
● = yes; ○ = no, none; C = Conner; CDC = CDC; F = Fujitsu; HP = Hewlett-Packard; M = Maxtor; Q = Quantum; S = Seagate Wren V; U = unknown (company would not disclose); WD = Western

to see why issues like the driver, ROM, and formatter can make a big difference in actual performance. And that's why several companies have been successful selling disk utilities that can speed up a hard drive. Such products include La Cie's Silverlining, Golden Triangle's DiskMaker, FWB's Hard Disk Toolkit, and Casa Blanca Works' Drive7. One of

these might turn a middling performer into a star—for a combined cost less than that of a top-speed drive.

Price Trends

JUDGING A HARD DRIVE'S PRICE involves issues of time, reliability, and peace of mind, not just dollars. Midrange hard drives tend to fall within three price



Best Buys All around, the APS 170 (top), Mirror Technologies Mirror 210 (bottom), and MacTel Index 210 (shown on page 219) are the best deals, offering low prices and solid performance.

Other Bundled Software	Maximum Partitions	A/UX Partitioning	Password Protection	Warranty (in months)	Extended Warranty (in months)	Toll-free Technical Support	Repair Turnaround (in days)	Data Recovery on Request	On-line Technical Support
public domain	52	●	○	24	○	●	2	for a fee	BBS
○	unlimited	●	○	24	○	○	14	for a fee	○
SCSI Director	unlimited	●	●	48 (Q,M); 60 (HP)	○	○	2-5	○	○
SUM II	16	●	●	12	12 ¹	○	2-5	none	AppleLink; BBS; GEnie
SUM II	44	●	●	60	○	●	2	○	BBS
DiskDoubler	unlimited	●	○						
○	1	○	○	24	up to 60	●	2-3	for a fee	○
○	99	●	●	24	up to 60	○	7-10	free	BBS
DiskDoubler	unlimited	●	○	24	12 ¹	○	1	for a fee	America Online;
ETC Tools 2.0	1	○	○	12	up to 24	●	3	for a fee	○
Hard Disk Toolkit	unlimited	●	●	24	○	○	2	free	CompuServe
MacTools Deluxe, public domain	unlimited	●	●	24	12 ¹	●	2	free	America Online; AppleLink; Compu-Serve; GEnie
○	unlimited	●	○	12 (M); 24 (Q)	up to 24	●	2	○	○
○	60	●	○	24	60	●	3	for a fee	○
○	60	●	○	24	60	●	3	for a fee	○
○	60	●	○	24	60	●	3	for a fee	○
○	unlimited	●	○	12	12	○	2	for a fee	AppleLink
○	unlimited	●	○	12	12	○	2	for a fee	AppleLink
○	unlimited	●	●	24 (Q); 48 (CDC)	up to 60	●	2	free	BBS
public domain	unlimited	●	●	24	○	○	2	free	○
○	unlimited	○	○	24	○	●	2	for a fee	○
○	36	●	●	12	12 ¹	○	2	○	○
Norton Utilities, public domain	unlimited	●	○	60	○	●	2	free	BBS
public domain	15	●	●	24	12 ¹	○	2	for a fee	America Online; BBS; GEnie
○	unlimited	●	●	12	up to 36	○	1	free	AppleLink; BBS
○	unlimited	●	●	12	up to 36	○	1	free	AppleLink; BBS
○	unlimited	○	○	36	○	○	none	○	○
public domain	6	○	○	12	12 ¹	○	○	○	○
○	unlimited	●	●	12	up to 48	●	2	○	BBS
○	unlimited	○	○	36(F);24(Q)	○	○	2	○	AppleLink
MacTools Deluxe	unlimited	●	●	24	○	○	3	○	AppleLink
MacInStor Installer	unlimited	●	●	24	up to 48	○	2	○	○
○	unlimited	●	●	24	○	●	2	for a fee	America Online; AppleLink; Connect
○	1	○	○	24	○	○	3	free	AppleLink

groups. The low-cost drives range roughly from \$700 to \$900. The midcost drives fall in the \$1100 to \$1300 range. And the high-cost drives go from \$1600 to nearly \$1900. The pricing reflects some general trends. For example, the low-cost drives' cases tend to look similar to each other, the midcost drives include fancier models such as the La Cie Tsunami drives, and the most expensive 200MB to 220MB model is also the fastest: the FWB PocketHammer200, at \$1799. But some of the fastest drives—such as the MacTel Index 210 and the Mirror Technologies Mirror 210—are among the cheapest, and there are drives that inexplicably manage to be expensive, plain-looking, and relatively slow all at the same time, such as the CMS Platinum 200.

Bundled Software

ALL THE HARD DRIVES WE LOOKED AT come with utilities that let you format, initialize, and test the drive; adjust performance parameters; and recover *bad blocks* (damaged or unusable segments). Nearly all these utilities let you divide, or *partition*, a drive into several volumes that appear as separate drives (called *logical drives* by techies) on the Finder desktop. The quality, functionality, and documentation of the bundled utilities vary widely. We did not exhaustively compare these utilities, but some did appear to be superior—for example, those bundled by FWB, La Cie, Mirror Technologies, and Storage Dimensions. Other packages, such as those provided by Deltaic Systems, ETC Peripherals, and Total Peripherals, had little functionality beyond formatting the drive.

Several manufacturers install megabytes of public domain or shareware software—usually games, fonts, HyperCard stacks, and yet more utilities. Good or bad, these dealer-installed utilities introduce a serious problem: if you want to partition the hard drive, you have to either back up the software you want to keep, or lose it all when you reformat the disk to make the partitions. And you'll

¹ Renewable.

probably want to delete some of the utilities to free up disk space.

A few vendors also bundle a full-blown professional set of utilities with their drives. For example, CMS Enhancements bundles SUM II, Microtech bundles The Norton Utilities for the Macintosh, and GCC and Rodime bundle MacTools Deluxe. These packages provide functions to recover lost files, repair damaged disks, and detect and prevent virus infections. But by buy-

ing one of these programs bundled with a hard drive, you may be paying more for the set than if you bought the drive and program separately.

Reliability, Warranty, and Support

PART OF A DRIVE'S REAL COST IS WHAT it takes to deal with problems that may come up. To a large extent you have to rely on what the vendor tells you. But in general, the more services and support a vendor offers, the better. All the compa-

nies offer a standard parts-and-labor warranty for anywhere from 12 months to 5 years, usually based on the drive mechanism; for example, most drives using Quantum mechanisms have at least a 24-month warranty, since that's what Quantum offers. Several vendors sell extended warranties, which extend the basic warranty to as long as five years. The length and quality of warranty offered may be a significant indication of the drive's component and assembly



Hard Drive Speed Tests 120MB-220MB

Color Key

Fastest

Percent slower than fastest

Up to 10%

11%-20%

21%-29%

30% or more

Overall Fastest

The drives are listed from best overall performance (top) to worst overall performance (bottom), based on both application and SCSI Evaluator low-level tests. To determine the ranking, we indexed overall performance numbers against the fastest drive. Thus, the FWB PocketHammer200 gets a 1.00 and the Relax Vista 180 gets a 0.65. Index numbers are listed to the left of the product name.

On the application tests, we tested each drive's ability to duplicate a 3.2MB file and a 10MB folder and search a database for a specific record. We also averaged the drive's speeds for opening and saving files from several applications including PageMaker and Excel. See "When Disk Speed Matters" for a comparison of the effort required for a drive to save various kinds of files.

C = Conner

CDC = CDC

F = Fujitsu

M = Maxtor

Q = Quantum

S = Seagate Wren

U = unknown

(company would not disclose)

WD = Western Digital

Overall Slowest

1.00	FWB PocketHammer200 (Q)
0.99	MacTel Index 210 (Q)
0.97	Storage Dimensions MacinStor 205-ZFP (M)
0.96	GCC UltraDrive 175 (CDC)
0.96	Optima MiniPak 200 (U)
0.96	MicroNet MS 173 (S)
0.95	Optima Diskcovery 200 (U)
0.94	La Cie Tsunami 210 (Q)
0.94	Mirror 210 (Q)
0.94	APS 210 (Q)
0.94	Procom 210 (Q)
0.94	PLI PL Turbo 200 (Q)
0.93	Cutting Edge 210 (Q)
0.93	Microtech 200 (Q)
0.93	Liberty 70 series 210 (Q)
0.93	Peripheral Vision Storage PV 200 (Q)
0.93	Ehman 210 (Q)
0.93	Relax Vista 210 (Q)
0.91	MacProducts USA MagicDrive 170 (CDC)
0.89	Liberty 70 series 170 (Q)
0.88	Deltaic Systems Server 210 (Q)
0.88	Cutting Edge 170 (Q)
0.88	Ehman 170 (Q)
0.88	HDI PowerDrive 210 (Q)
0.88	APS 170 (Q)
0.88	Club Mac 210 (Q)
0.86	DJK 213 (M)
0.86	HDI PowerDrive 213 (M)
0.86	La Cie Tsunami 120 (Q)
0.86	MicroNet MS 200 (M)
0.84	MacProducts USA MagicDrive 210 (Q)
0.84	Rodime Cobra 210 (M)
0.82	ETC DataPort 170 (Q)
0.82	APS 200 (M)
0.81	CD Technology HD Porta-Drive 200 (C)
0.81	MacProducts USA MagicDrive 170 (Q)
0.80	La Cie Tsunami 170 (Q)
0.80	CMS Platinum series 200 (WD)
0.78	APS 120 (M)
0.78	Total Peripherals TP 210 (Q)
0.76	Liberty 50 series 120 (Q)
0.75	Total Peripherals TP 170 (Q)
0.72	Storage Dimensions MacinStor 120-ZFP (Q)
0.65	Relax Vista 180 (F)

Duplicate (in seconds)	Open (in seconds)	Save (in seconds)	Search (in minutes)	Compile (in minutes)	SCSI Evaluator Read (in kbps)	SCSI Evaluator Write (in kbps)
100.0	74.2	55.5	34.3	30.1	1.27	1.43
101.5	75.0	55.9	34.3	30.6	1.27	1.43
108.7	76.7	62.3	32.3	30.5	1.43	1.19
109.3	75.2	60.1	34.3	31.3	1.28	1.26
108.8	77.3	62.7	34.9	31.7	1.42	1.28
109.4	75.5	60.1	34.2	31.0	1.28	1.28
108.8	77.8	62.4	34.9	32.1	1.42	1.19
109.4	75.3	62.1	34.6	32.0	1.26	1.28
107.2	74.3	60.0	34.1	31.6	1.28	1.13
108.6	75.2	60.0	34.0	31.1	1.28	1.13
107.5	74.7	60.3	34.1	31.5	1.27	1.13
107.4	75.0	60.0	34.2	31.5	1.27	1.13
107.6	75.7	60.8	34.2	31.6	1.27	1.13
109.4	75.4	60.4	34.1	31.6	1.27	1.13
109.5	75.2	60.6	34.4	31.5	1.27	1.13
108.6	75.7	60.9	34.1	31.0	1.28	1.13
109.9	75.1	61.9	34.3	31.4	1.28	1.13
108.9	77.5	61.7	34.2	31.8	1.27	1.13
110.9	77.1	62.8	35.4	31.8	1.22	1.12
111.7	75.8	62.3	34.5	31.4	1.07	0.97
112.8	76.2	61.8	34.3	32.1	1.08	0.97
113.9	76.4	63.1	34.5	32.2	1.08	0.97
113.3	76.1	62.4	34.7	32.3	1.08	0.97
108.7	75.2	60.1	34.0	32.2	0.92	0.95
113.5	77.1	63.4	34.2	32.8	1.08	0.98
107.9	74.8	60.5	34.1	31.5	0.91	0.89
128.0	89.1	67.3	41.8	37.6	1.42	1.28
127.6	89.6	67.0	41.9	37.5	1.42	1.27
123.6	78.0	66.3	35.4	32.2	1.07	1.05
125.8	89.8	67.4	42.1	37.5	1.43	1.19
102.6	75.5	60.7	35.2	31.7	0.93	0.93
120.4	80.4	61.1	33.2	33.4	0.88	0.87
112.9	77.0	63.4	34.1	31.8	0.76	0.72
127.6	89.6	67.2	42.1	37.7	1.24	1.03
122.1	81.5	66.7	33.4	32.6	0.83	0.82
112.3	76.8	61.3	34.5	31.5	0.65	0.65
113.5	77.2	62.7	34.4	32.1	0.64	0.64
118.0	88.9	63.3	40.5	33.9	0.94	0.94
128.8	82.0	68.1	38.6	34.0	0.88	0.81
127.9	81.6	66.2	35.2	33.6	0.71	0.79
131.0	85.7	73.1	39.1	35.1	0.78	0.75
138.2	83.7	71.6	36.0	33.2	0.70	0.73
143.6	95.0	71.0	46.4	38.9	0.89	0.89
153.9	94.0	80.6	41.4	38.1	0.60	0.58

Mirror 210 Fast and inexpensive, this 210MB drive also has some of the best documentation, utilities, and public-domain software of the drives surveyed. **Company:** Mirror Technologies. **List price:** \$829.

Index 210 This is both one of the fastest and one of the cheapest drives in the 210MB capacity range. Despite the Index 210's low price, it also offers good documentation. **Company:** MacTel Technology Corporation. **List price:** \$699.

APS 170 If price is your primary consideration, this drive offers the best deal while delivering a lot of capacity (170MB). **Company:** APS. **List price:** \$589.

Ancillary Issues

FINALLY, THERE ARE THE ODDS AND ends that make a joy or a pain.

Documentation quality is one such area, and the range is wide: from literally no documentation at all (as with the Relax drives), to good basic documentation (such as with APS, DJK Development, and MicroNet Technology drives), to absolutely first-class technical manuals that are well written, informative, and useful (such as with FWB, La Cie, MicroNet, Mirror, and Procom drives).

Another issue for some is a drive's size and appearance—after all, you'll be looking at it day in, day out. Most of the drives have the same dimensions, designed to fit underneath a compact Mac; fully half of the drives are almost identical in appearance and layout—and I found them unattractive. Unfortunately, the drives I found visually attractive—La Cie, FWB, and Liberty—are pricier.

Another concern is how the drive handles termination, cabling, power, SCSI IDs, and so on. Luckily, manufacturers seem to be heading toward a standard: external termination (the easiest to use), dual 50-pin connectors (standard), a push-button switch for SCSI ID (also the easiest to use), and a universal power supply that adapts automatically to a wide range of voltages (Liberty and PLI offer universal power supplies only as an option). Where internal termination is used, most companies provide a removable plate for easy access to the terminating resistors. However, a few unenlightened firms, such as CMS and Total Peripherals, require that you take the drive to a dealer (or disassemble it yourself) to change the termination.

quality. A 12-month warranty can be a warning flag, while a 48- to 60-month warranty may indicate that the company is very confident in its quality.

There is no apparent correlation between support and drive prices: some of the most complete support services are offered by low-end vendors such as APS and Mirror, while some midrange and high-end vendors (such as CD Technology and Liberty Systems) offer fewer support options.

For disk repair times, the current industry "standard"—what most companies quote when asked—is a 48- to 72-hour turnaround from receipt of the drive. Some firms are more modest (or honest) and quote turnaround times of 5 to 10 days.



Performance Art For those seeking drives that can double as desktop sculpture, five stand out (clockwise from top): the Liberty Systems Stealth 170, La Cie Tsunami 210Q, ETC Peripherals ETC DataPort C170Q, Peripheral Vision Storage PV-200, and CD Technology HD Porta-Drive 200. But art is not cheap: be prepared to spend more money to get both form and function.

Standout Performers

NOT ALL THE DRIVES IN THIS SURVEY excel. Some, such as the Deltaic Systems Server 210 and the two Total Peripherals drives, have minimal software functionality. Others, such as the Relax Vista 180, have no manual, and the few online notes are Microsoft Word files that can't be opened until you install Word. The Relax Vista 180 is also the slowest drive tested, and Total Peripherals' drives were also near the bottom of the performance list.

Some drives compete well on features but seem awfully pricey. Case in point: the Storage Dimensions MacinStor 205-ZFP was in the top five in overall performance and offers excellent utility software and documentation, but it costs \$1609.

The overall best buy is the Mirror Technologies Mirror 210 hard drive. Its \$829 price is low, and it ranks among the top 10 drives in performance. Equally important, it has some of the best documentation, disk utilities, and public-domain software of the drives surveyed.

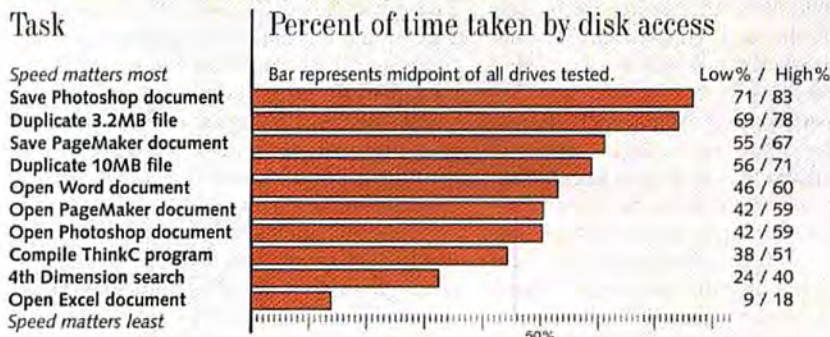
Look at drives with a lot of capacity and decide which other features you want. Then look for the lowest price. That's the best way to pick a drive. **m**

See *Where to Buy* under Midrange Hard Drives for contact information.

BRUCE F. WEBSTER, a *Macworld* contributing editor, is the vice president of product development for Pages, Inc., a San Diego-based software development firm.

Macworld Lab testing supervised by Mark Hurlow.

When Disk Speed Matters



Disk-access speed matters greatly for disk-intensive tasks like copying files and saving graphics images. But for tasks that require little disk access, disk speed is not very important. When weighing the importance of speed, keep in mind the kinds of tasks you do. For example,

opening an Excel document requires little disk access, so a fast drive is not important. The percentages reported here are based on tests conducted on a Macintosh IIci with all the drives in "Hard Drive Speed Tests." The disk-access percentages will vary on different CPUs.



Digital Data on DEMAND

Fast, reliable, pay-by-the-call data communication is here

by Lon Poole



NOTHER PART OF YOUR LIFE IS ABOUT TO go digital. This time it's data communication—transferring files, connecting to remote networks, and other “talking” a computer does on the phone with fellow computers. By going digital, you don't need to use error-prone analog modems; instead you get nearly error-free data communication at speeds modems can only dream of. Telephone companies in the United States, Canada, Japan, and Western Europe offer digital services that cost about the same to use per call as high-speed modems. These services are called switched digital services because they take advantage of switched phone lines to keep costs down. Placing a call switches on a connection to a phone line, and ending a call switches off the connection, freeing the line for another call. You pay only for calls you make, not for full-time use of a dedicated phone line.

Macworld started using switched digital services last summer to transmit scanned-image files and Aldus PageMaker files of magazine pages to and from Digital Pre-Press International (DPI), a San Francisco prepress service bureau. The files, which range in size from several hundred kilobytes to over 100 megabytes, used to be copied onto disk cartridges and carried to DPI by bike messenger. In addition, *Macworld's* San Francisco office keeps stories and artwork on a file server that sister magazines in other countries can quickly access using switched digital services. Previewing and copying those files

by modem takes forever, and transfers too often fail due to noisy phone lines.

What You Get

U.S. TELEPHONE COMPANIES OFFER two types of switched digital services, switched 56-kbps service and ISDN (Integrated Services Digital Network). With switched 56 service you get a single phone line that can transfer digital data at speeds up to 56,000 bits per second. You can't use the line to make voice calls or send Group 3 faxes.

ISDN service gives you more than one communication channel on a single line. You get two or more 64,000-bps channels for digitized voice, digital data, or Group 4 (high-speed digital) fax calls. These are called B (Bearer) channels. You can use B channels independently or combine the channels for higher data-transmission rates. For example, you might talk on one B channel while your computer communicates on another, or you might combine two B channels for video teleconferencing.

The B channels only carry content. Another channel, called the D (Delta) channel, carries signaling information that makes and controls B-channel connections. The D channel operates at 16,000 bps or 64,000 bps depending on the type of ISDN service. Signaling doesn't keep the D channel busy, so it can also be used for data transfer at rates equivalent to those of a 9600-bps modem or for X.25 packet switching.

In addition to data-transfer capabilities, ISDN can improve the sound quality of voice calls. ISDN also offers features such as the ability to display a caller's phone number before you answer a call, add that number to a list of unanswered calls, or use it to look up information about the caller in your database. (Access to the caller's number may be restricted or blocked in some states.) Several newly announced applications can use ISDN voice features, including Northern Telecom's Meridian TeleCenter, and Cypress Research's PhonePro.

Where It Goes

ALTHOUGH SWITCHED 56 AND ISDN are switched services, you can't use them to call just anywhere. You can call other switched digital lines served by the same

Where It Is

YOU MAY HAVE TROUBLE OBTAINING ISDN or switched 56 service from your local phone company. Neither service is available everywhere. Right now ISDN service is concentrated in the business districts of major metropolitan areas (see "ISDN Lines in the U.S."). Switched 56 service is more widely available but is not universal. Even in areas where switched digital services are available, phone company representatives may not know ISDN and switched 56 exist, or they may not know them by those generic names. Each phone company has its own names for these services. Pacific Bell, for example, has an ISDN service named Centrex IS and a switched 56 service named CenPath. Fortunately this picture should improve during the next year as

varies depending on the type of service the phone company offers). Pacific Bell charges \$30 to \$40 monthly per switched digital line and \$15 per conventional voice Centrex line. You also pay connect charges at standard voice-call rates. Lower-cost switched digital services are available in some parts of the United States and should become more widespread this year.

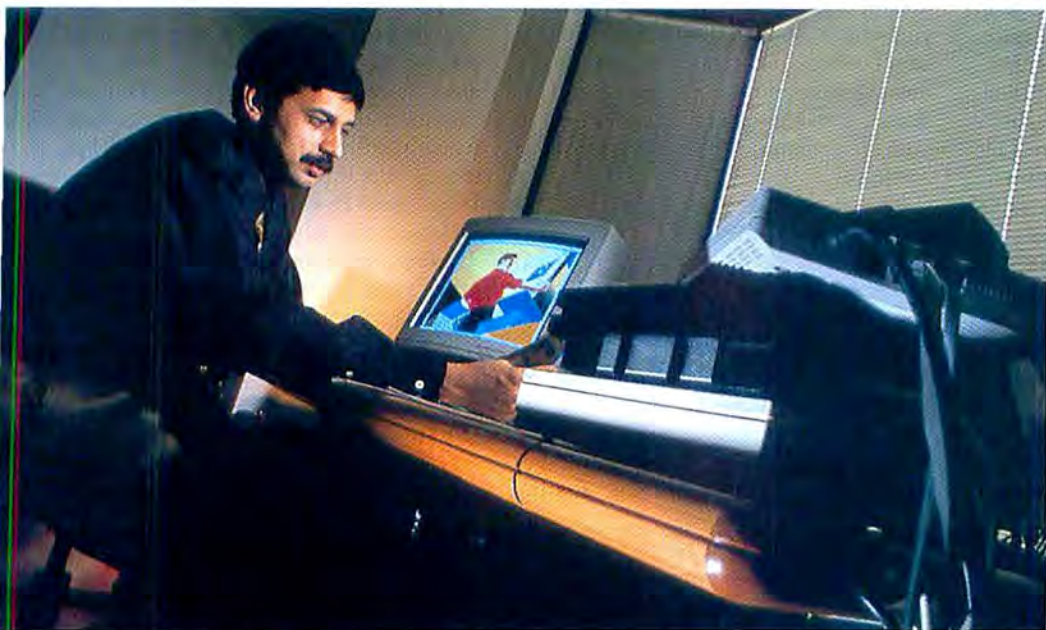
If you plan to make ISDN or switched 56 calls outside your state or service area, you must choose a long-distance company and pay it for those calls. Switched digital calls cost the same as ordinary voice calls on AT&T, MCI, and Sprint.

To get ISDN at your building, you must be located within about 2 miles of a phone company central office that has switching equipment for routing ISDN calls. This distance will increase to about 3½ miles as telephone companies install new switching equipment over the next few years. For switched 56 service you must be within about 3½ miles of a central office with switched 56 switching equipment. The geographical areas served by central offices vary widely; they are roughly the size of—but by no means coincide with—zip code areas. If you are farther away than the maximum distance, the phone company must run a high-speed dedicated line from a switched digital central office to your phone company central office or directly to your building. You pay a monthly fee for full-time use of that line and also pay by the call for calls that must be routed beyond the central office. A dedicated line is generally not economical unless you install at least six ISDN or switched 56 lines on it.

Inside Your Building

NEITHER BASIC-RATE ISDN (TWO B channels and one D channel) nor switched 56 service requires special wiring inside your building. Basic-rate ISDN service, like ordinary voice service, uses two of the four wires routed to common RJ-11 modular jacks. Switched 56 service requires either two wires or four, depending on the specific type of service your phone company offers. You can usually replace an existing voice line with basic-rate ISDN or switched 56 service without any wiring change inside the building.

To use an ISDN line, you must install a terminator, called an NT1, to maintain



Macworld uses switched digital services to send files of the magazine's pages to Digital Pre-Press International, a San Francisco prepress service bureau. Files are sent—with no transmission errors—at 64,000 bits per second. Previously, files were copied onto disk cartridges and sent to the service bureau by messenger.

central office. Calling beyond your local telephone company's central office becomes more complicated, especially for ISDN. The transmission rate drops to 56,000 bps because that's the maximum for the trunk lines that carry calls outside a central office. Likewise, calls outside your service area (as depicted in your telephone book), state, or country run at 56,000 bps.

For example, *Macworld* and DPI are served by the same central office in San Francisco and can transfer files at 64,000 bps over an ISDN line. But when *Macworld Japan* places an ISDN call to *Macworld* in San Francisco, the two communicate at 56,000 bps. Still, that transfer speed is many times faster than a high-speed modem.

telephone companies install more ISDN and switched 56 services and promote them more aggressively.

Like names, charges for switched digital services vary among phone companies. Your local phone company may compound the cost of getting ISDN or switched 56 by requiring that you also have an unrelated service such as Centrex, which gives business customers PBX capabilities from the phone-company central office. Pacific Bell charges \$540 to \$650 to establish Centrex service and install two Centrex lines (its minimum) with a switched digital service on one of them. In addition to paying the phone company's installation costs, you must buy special equipment to attach to the phone lines (the type of equipment

signal quality on the phone-company lines. The NT1 terminator usually connects to your RJ-11 wall jack. It costs \$100 to \$300, and you must buy one that has been made for the switching equipment installed in your phone company's central office. As the switching equipment migrates to new standards over the next few years, you should have a wider choice of vendors. Switched 56 service does not need a terminator.

Connecting to a Mac

ALTHOUGH ISDN AND SWITCHED 56 services transfer data digitally, you can't connect them directly to a computer. You don't need an ordinary modem to convert digital data from the computer to analog data (sounds) or the reverse. Instead you need a device that prepares the digital data from a computer for transmission on digital phone lines. Think of it as a digital modem.

The ISDN digital modem is called a terminal adapter (TA). You can buy a freestanding TA from Northern Telecom, Fujitsu, Hayes, UDS/Motorola, and other companies for \$750 to \$2000. You can also install a TA inside any Macintosh with a spare NuBus slot. Apple should already be shipping its \$1099 ISDN NB Card. Apple's NuBus board and some of the freestanding TAs convert a second B channel to let you plug in a standard telephone, answering machine, or Group 3 fax machine. Alternatively, you can buy an ISDN telephone with an integral TA and data port for

\$500 to \$1000 from AT&T or Fujitsu, or for \$700 to \$1100 from Telrad.

Digital modems for switched 56 go under two names, depending on the type of switched 56 service your phone company offers. One is called a DSU/CSU (Digital Service Unit/Channel Service Unit) and the other is called a Data Unit. AT&T, Northern Telecom, UDS/Motorola, and others sell them. Some ISDN terminal adapters can also be used as switched 56 digital modems.

To further complicate the situation, digital modems are not all compatible with each other, nor is every digital modem compatible with all types of switching equipment used in phone-company central offices. You may be unable to call someone else who has switched digital service because your digital modems are incompatible. And if you're not careful, you could buy a digital modem that won't work with the switching equipment at your phone-company central office or with the switching equipment at your new central office after you move across town.

Using a Digital Modem

DIGITAL MODEMS WITH SWITCHED digital services can speed up file transfer, screen sharing, and remote network access. For simple file transfer between two Macs, you can use Microphone II, WhiteKnight, VersaTerm Pro, or another terminal program. To remotely operate (and exchange files with) another Macintosh, you can use screen-sharing

software like Timbuktu/Remote. Products like Farallon's PhoneNet Liaison and Shiva's TeleBridge let you access E-mail, file servers, and other network services from a remote Mac.

When used with a freestanding digital modem connected to the Mac's modem or printer port, none of these applications can take full advantage of switched digital speed. The Mac serial ports can run at 57,600 bps asynchronously, but today's system software, which handles serial communications for application programs, can't sustain that rate. The serial port can usually sustain a throughput rate of 19,200 bps—the exact speed depends on factors such as the speed of your Mac, the communications protocol, and the design of the application program.

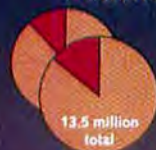
Some programs can achieve full switched digital speed if they are used with an ISDN NuBus board. These programs use the Communications Toolbox part of system software to transfer data synchronously at 56,000 bps or 64,000 bps through the ISDN board. At this writing, VersaTerm Pro and Timbuktu/Remote are compatible with the Communications Toolbox, and compatible versions of the other products mentioned above are in progress. (The Communications Toolbox is built into System 7 and can be added as an INIT to Systems 6.0.4 through 6.0.8.)

On Your Network

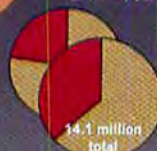
WITH SWITCHED DIGITAL SERVICES you can go beyond connecting a

ISDN Lines in the U.S.

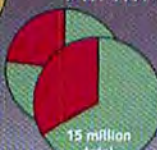
Southwestern Bell



US West



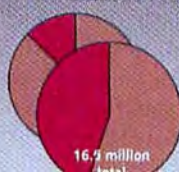
Pacific Bell



NYNEX



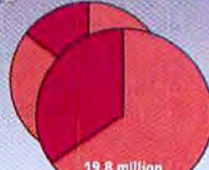
Ameritech



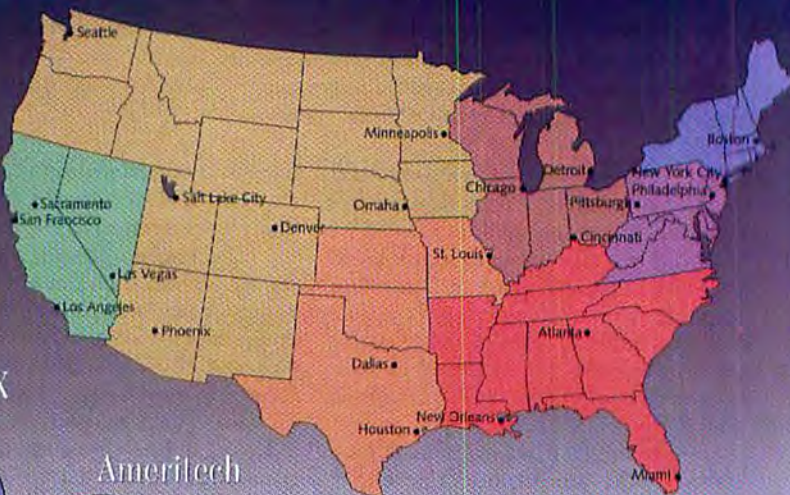
Bell Atlantic



BellSouth



Each year, telephone companies across the country are installing more lines that have access to ISDN. Each pie chart represents the total number of telephone lines in a region—the more lines, the larger the pie chart. The charts in front represent figures for 1994; the charts in back represent figures for 1991. The red slices of the pies represent the percentage of lines with access to ISDN.



Mac to a distant network. You can interconnect multiple AppleTalk networks and share network services. For instance, *Macworld* affiliates in different countries can link networks to access each other's file servers and exchange E-mail by placing ISDN phone calls. After linking networks, a *Macworld* editor uses Timbuktu to preview large illustrations (by opening them on the distant network's file server) and to transfer files. Timbuktu or a new product, Aspects, let several users work on the same document simultaneously from separate Macs.

You can also access a distant network with the Chooser and connect to file servers, items shared with System 7's file sharing, and printers. If you use the Chooser to mount a distant file server or shared item on your desktop, you can copy files to or from the server with the Finder. With applications that take advantage of System 7's publish and subscribe technology, you can include live copies of material from a distant file server or shared disk. If someone changes the original material, your documents are automatically updated across the switched digital network link. Applications that use System 7's program-linking capability to share services, such as MacProject II 2.5 and Claris Resolve, could be located on remote networks.

To set up a switched digital link between AppleTalk networks, you connect each network to a router, each router to a modem, and each digital modem to a switched digital phone line. The router examines packets of data traveling on the local network and routes packets headed for the distant network across the phone line.

Some routers, such as Farallon's \$395 PhoneNet Liaison, are software that run on any Macintosh connected to the network. Hardware routers connect independently to the LocalTalk cabling. They include Engage Communication's \$1895 SyncRouter, Shiva's \$599 TeleBridge, Solana Electronics' \$2195 H-Server, and International Transware's \$899 TransTalk. Although the PhoneNet Liaison and the TeleBridge routers cost less, they communicate asynchronously at only 19,200 bps to 38,400 bps. The other routers communicate synchronously at the switched digital service's full 64,000 bps or 56,000 bps.

The History of ISDN

1960 More than 30 years ago the telephone company realized it could make more money by digitizing the public telephone network. A digital network would allow combining multiple calls on a single transmission path, increasing the carrying capacity of the copper wire already installed worldwide. In the sixties the phone company began digitizing long-distance calls.



1980 The past decade has seen a large increase in the amount of data sent over the telephone network by computers. The computer's digital data must be converted to analog data (sounds) before it is sent over the partly analog telephone network, and then converted from analog back to digital upon receipt; modems handle these conversion chores. At most, modems send and receive data at 19,200 bps (most modems work at even slower speeds—9600 or 2400 bps), wasting a good deal of the available 64,000 bps available on a telephone call.



1990 Full-speed data transmission is possible on a completely digital telephone network. Local phone companies are now digitizing the "last mile" (also called the local loop) between the telephone-company central offices and individual businesses and homes.



Routers made by different companies are incompatible, and more compatibility problems exist between routers, digital modems, and phone-company central-office switching equipment. In setting up its international file server, for example, *Macworld* first tried H-Servers, found them to be incompatible with something in Tokyo, switched to SynchRouters, and is currently evaluating TransTalk routers for its enhanced network-security options. Other people in Tokyo, New York, and Paris, however, have used H-Servers without any trouble whatsoever.

To make your network more secure, some routers let you restrict access by users on linked networks to specific zones in your network. Without this zone-blocking control someone at *Macworld*

could accidentally print a document on DPI's imagesetter—a costly mistake. Some routers offer other security provisions that help keep hackers out of your network.

Experienced users say network performance across a switched digital link rivals that of a direct connection to a LocalTalk network with five to ten active users. Apparently a private 56,000-bps or 64,000-bps connection using a hardware router approximately matches an individual's share of a 232,000-bps LocalTalk or PhoneNet-type connection. Of course performance declines when several people actively use an ISDN or switched 56 network connection simultaneously. Your choice of digital modem and router may also give you lower performance.

Not only are switched digital services fast, they are also extremely reliable. You can't transfer multimegabyte files frequently using ordinary modems and voice phone lines without failures due to line noise. But *Macworld* editors routinely use ISDN to transfer tens of megabytes across town and across the Pacific without any failure. Other ISDN and switched 56 users report the same reliability—no errors, period.

ISDN Today

SWITCHED 56 AND ISDN PROMISE a lot and deliver it to some Macintosh users, but don't hang up your modem just yet. You'll still need it to connect to commercial information services, national E-mail services, and electronic bulletin boards. And if you sometimes access files and E-mail on your office

network or your office Macintosh from home or a hotel room, you'll want a modem for that too. Switched digital services can't help you with those connections today.

Right now those most able to take advantage of ISDN or switched 56 services are businesses needing to link locations and transfer lots of data regularly but not constantly. The rest of us must anxiously wait while switched digital services come to our telephone prefixes. **m**

See *Where to Buy* under Digital data for contact information.

Contributing editor LON POOLE has written about new technology for *Macworld* since its first issue. His latest book is *Macworld Guide to System 7* (IDG Books Worldwide, 1991).

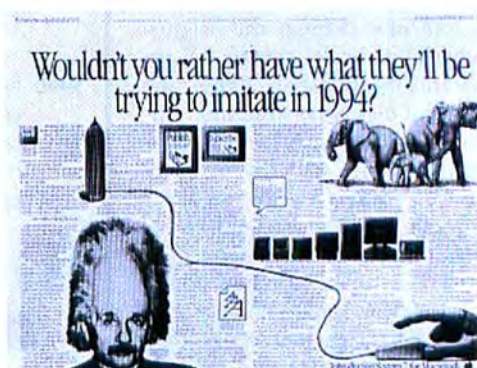


Year in Review



This photo has nothing to do with stock options of corporate executives. Jack Kuehler, IBM, and John Sculley, Apple, announce the deal of the year.

Apple announced QuickTime and true portable computers. The Microsoft suit drags on, overshadowing the industry. Apple announced its largest layoff and profit losses ever. John Sculley traded in four years of development work for an IBM pact. We'd like to think the worst is over . . .



Award for Best Subliminal Message

Did Apple really intend to show the mouse in this ad connected to IBM's Atlanta headquarters?

Top Legal Actions, or the We're All Friends in This Industry Department



- Apple-HP, Microsoft suit
- Apple Corps settlement with Apple Computer
- Apple stockholder suit over 1983 Twiggy drive
- Apple stockholder suit over spring price drop
- Apple settlement with minority employees
- FTC probe of Microsoft

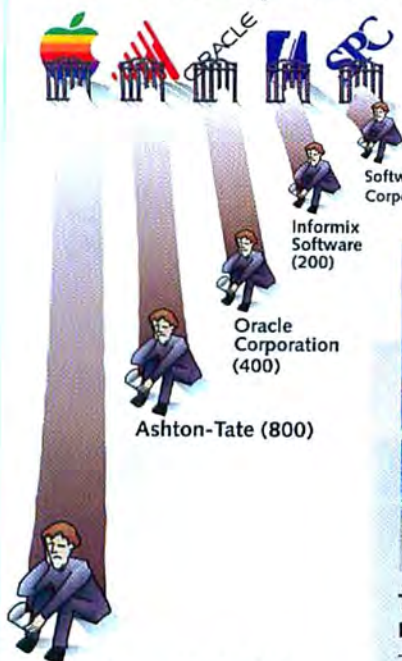


So will we all grow to look like Michael Jackson someday?

Toshiba ad portraying Mac user as *Australopithecus*.

The Economy Is in Recovery

Layoffs in the computer industry



Apple Computer (1500)

Where Are They Now Department (Apple developers)

- Don Casey (now at Wang)
- Lotus Marketplace
- Jasmine Technologies
- Lotus 1-2-3 for the Mac



Nathan Schulhof, formerly of
Jasmine



Top Ten Bill Gates Epithets

- *Forbes*: Cocky Bill Gates
- *Forbes*: Second Richest Man in the U.S.
- *Fortune*: Longtime Wunderkinder
- *Newsweek*: [the] Whiz They Love to Hate
- *New York Times*: Mr. Software
- *Playboy*: Soft Icon
- *Seattle Post*: Impish Bill Gates
- *Time*: 800-lb. Gorilla
- *Business Month*: Silicon Bully
- *U.S. News & World Report*: Market Mover



It Sure Melts My Butter Department

From the *Playboy* interview of Siskel and Ebert.

Ebert: What frustrates me is that Gene could make life so much easier for himself and save himself so much trouble if he would get himself a Macintosh computer. . . .

Playboy: Why won't you buy him one?

Ebert: I'm not going to give him no Macintosh as a present.



Apple Still Leaks from the Top

John Sculley preannounces the PowerBooks in April of 1990.

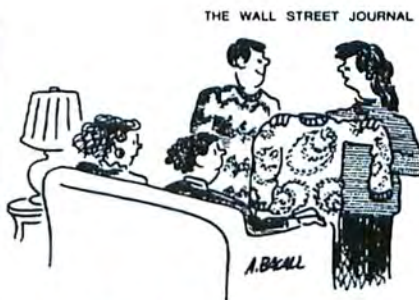
Where Are They Now Department (Apple)

- Apple employee collective bargaining
- Apple IIe board for the Macintosh LC
- Speedstart program
- Wireless computing
- Machandwriter
- Kinder, gentler Apple
- TrueImage
- Apple consumer division
- Apple investment in British RISC chip technology
- Ethernet boards



Machandwriter

The Macintosh in Cartoons





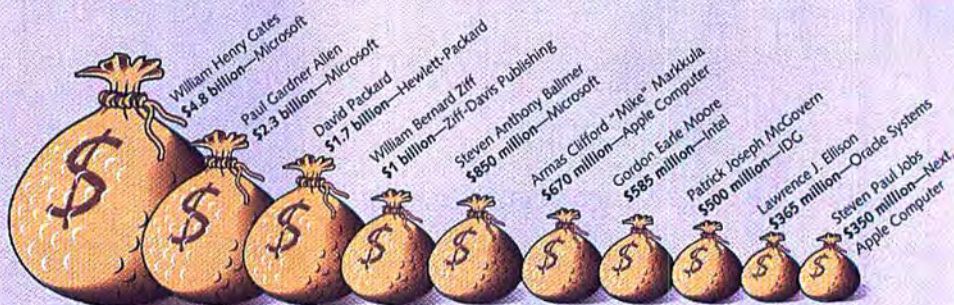
Apple Customer Support's Most-Often-Asked Questions

Why won't my computer recognize my hard drive?
What's SCSI?
What's termination?
My machine crashes when I...
My computer says I don't have enough memory...
I just bought it.
How do I get Mode32?
Who is my local reseller?
How long do I have to stay on hold?



Just Plain Bugs Department

Computer Millionaires



Source: Forbes Magazine



Actually, he runs the accounting department; his brother is in tech support.
Jasmine booth at Macworld Expo features live chimp, adding to the zoo-like atmosphere.

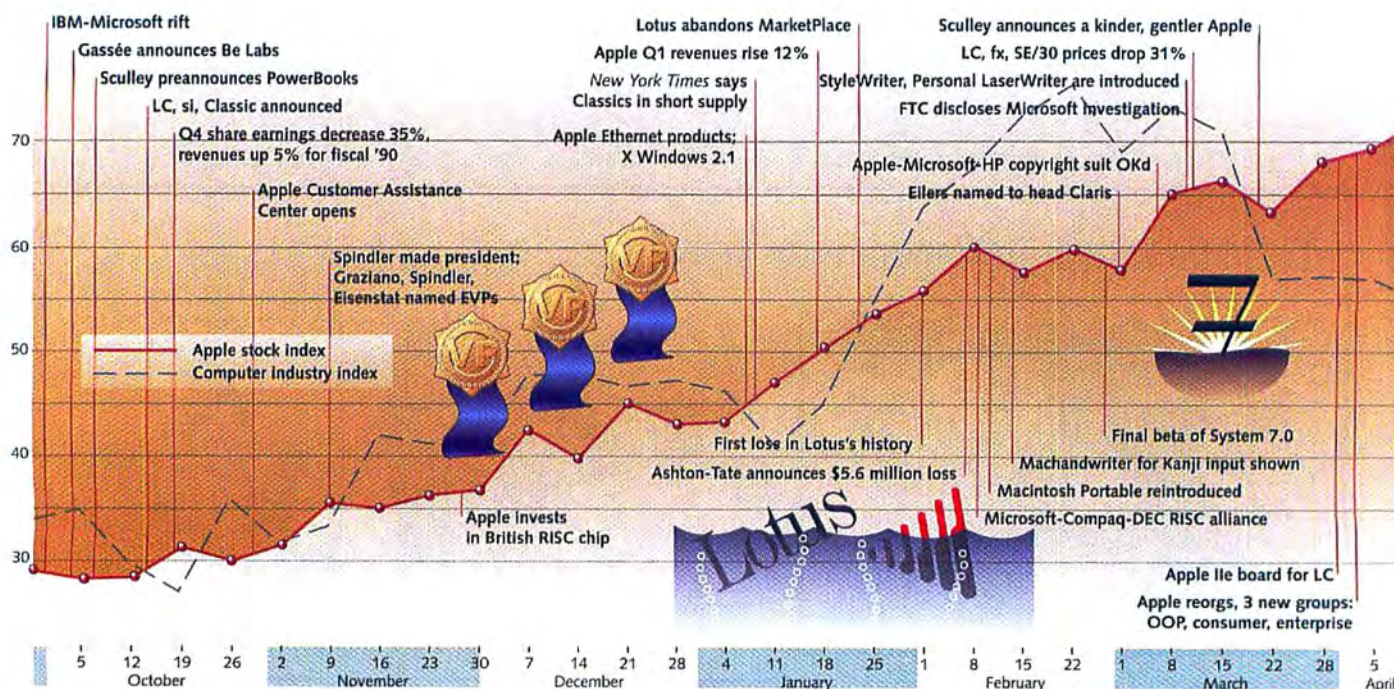


We assume she had to check some luggage.
And that she's stronger than she looks. Martin Marietta ad features a tot using a Mac Portable on a plane.



And to think I used to support Cesar Chavez.
Apple janitors disrupt the annual stockholder meeting in their efforts to unionize the janitorial work force at Apple.

Year at a Glance





Top Stock Sellers

(Dollar amounts from Apple stock sold during 1991)

Mike Markkula
\$20.56 million

Albert Eisenstat
\$10.91 million

John Sculley
\$5.35 million

Kevin Sullivan
\$4.32 million

Peter Crisp
\$2.22 million

Sören Olsson
\$2.06 million

Joseph Graziano
\$1.45 million

Fred Forsyth
\$1.44 million

Ian Diery
\$1.14 million

Edward Stead
\$0.80 million

Joseph Arena
\$0.69 million

John Moon
\$0.58 million

Michael Spindler
\$0.51 million

Say What?

During a speech in Japan in October 1991 Sculley announces a 1992 version of the LC with a CD ROM drive... six months after killing the Fast Eddy project, a Mac LC computer with a built-in CD ROM drive.

The 7 seas.
The 7 deadly sins.
The 7 voyages of Sinbad.
The 7 wonders of the world.
The 7 colors of the spectrum.
The 7 articles of the U.S. Constitution.
And of course, Snow White and the 7 dwarfs.

We might have added the Seventh Seal.

Apple creative services' copy likens the announcement of System 7 to the seven wonders of the world.

Cache Switch

640 Processor Cache:

v7.0.1

☐ Faster (Caches Enabled)
 ☒ More Compatible (Caches Disabled)

Some applications will not work correctly when the processor's caches are enabled.

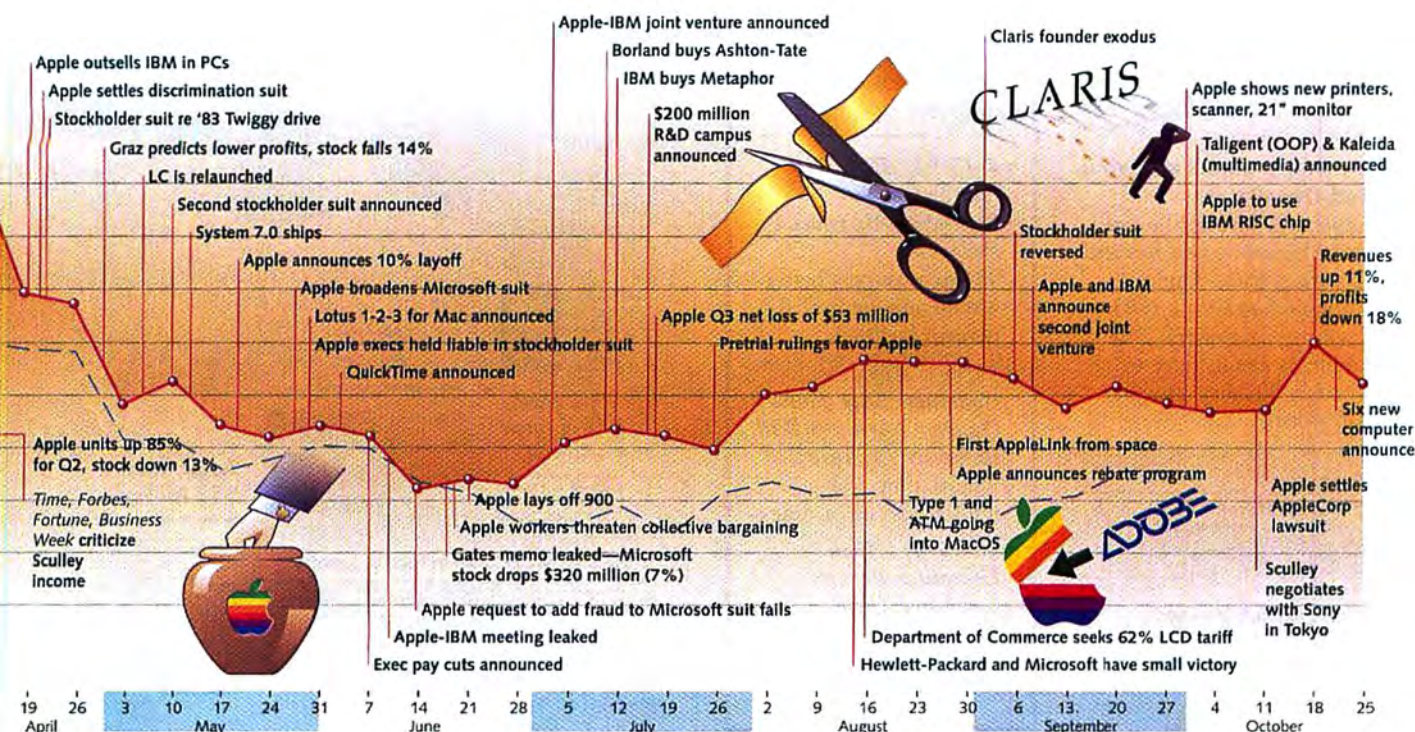
But you only paid \$8000 for it!

Best Dialog Box of the Year Award for a utility that ships with Apple's new Quadra computers.



Perhaps Ritalin would help?

Borland CEO and founder Philippe Kahn strives for most unusual CEO photographs by posing with musical instruments, sailboats, and motorcycles.



Headlines of the Year

TECHNOLOGY Ken Siegmann

Hewlett-Packard Is Ready to Launch Snake Attack

Hewlett-Packard Co., the Palo Alto-based computer and electronics giant, has been getting better at the war of attrition in the software market for more than a year.

HP's competitors — most notably Microsoft — have been getting better at the war of attrition in the software market for more than a year.

Software Publishers Taking Aim At Pirates

By Ken Siegmann
Chronic Staff Writer

Illegal copying costs the \$182 billion personal computer software industry between \$6 billion and \$7 billion in lost sales, says the Software Publishers Association.

Apple's Sculley Meets the Lotus 1-2-3

A Apple Computer CEO John Sculley, right, is pictured here with Lotus Development Corp. President Mitch Kapor, left, in a meeting. The two men are seen in a meeting room, with Sculley on the right and Kapor on the left. They are both smiling and looking at each other.

Maybe that's what happened to 1-2-3!

AT DEADLINE

Apple Says Microsoft Lied To Get '85 Licensing Pact

Microsoft Corp. used lies and threats to force Apple Computer Inc. to sign a 1985 licensing agreement key to the development of Windows, Apple told a federal judge last week. Apple filed a motion to expunge its 1985 licensing agreement with Microsoft and Hewlett-Packard, asking that its 1985 licensing agreement with Microsoft be declared invalid, as more a Microsoft attorney described as "deceptive." U.S. District Judge Vaughn set a hearing on the motion for June 14.

— Tom Quinlan

My Dad Is Gonna Kick Your Butt Department

Apple tells a federal judge that Microsoft used lies and threats to force Apple Computer to sign a 1985 licensing agreement. But inquiring minds have to wonder, did they use any bad words?

Business

Profit report trashes Apple stock

Lower-than-expected profit margins for Apple Computer Inc. have led to a sharp drop in its stock price.

Profit report trashes Apple stock

23 million shares traded in a single day.

App Composite Index Falls 0.2% as Investors Retreat Following Missile Hit in Israel

The Composite Index of the New York Stock Exchange fell 0.2% to 2,814.14 on Monday, as investors retreated following the missile attack on Israel.

OTC FOCUS

The OTC index fell 0.1% to 1,111.11 on Monday.

level of very large

The level of very large orders in the market was high on Monday.

TrueType Will Help Resolve the Font Puzzle

Windows 3.1 Promises to Make TrueType a Standard, But Some Confusion Will Undoubtedly Puddle Users

By Robert Calkins

Windows 3.1, the next version of the operating system from Microsoft Corp., will be a significant step forward in the way Windows handles fonts. It will be the first version of Windows to support TrueType, a font technology developed by Apple Computer.

TrueType is a font technology developed by Apple Computer. It allows fonts to be scaled to any size without losing quality. This is a significant improvement over the fixed-size fonts used in previous versions of Windows.

We'd agree with the "some confusion" part.

Nominations for Press Release Euphemisms of the Year from the Department of Clarification and Obfuscation, Apple Computer

- 4-17-91: Apple Rolls Out Extensive Commute Alternative Program
There must be a better way to announce a 10 percent layoff.
- 5-1-91: Apple Computer Says Third Quarter Earnings Will Be under Pressure
Translation: \$53 million loss of earnings.
- 10-17-91: Apple Computer Reports Sustained Unit Momentum
Translation: 18 percent decrease in revenues.

Setting up a challenge to Intel

21 firms unite to create new computer standard

A group of 21 computer manufacturers, including Apple, have joined forces to create a new computer standard that will challenge Intel's dominance in the market.

Yes, but they're certainly a happy-looking group of oinkers. This is what the Germans would call *die eierlegende Wollmilchsau*, an egg-laying woolly milk pig.

Sony to Supply Apple Computer With Portable PCs

By JACOB M. SCHLESINGER
Staff Reporter of THE WALL STREET JOURNAL

TOKYO—Sony Corp. said it will produce portable personal computers for Apple Computer Inc., filling a major gap in Apple's product line.

A Sony spokeswoman said the company received a request earlier this year from Apple to build the PCs. She wouldn't say whether it would be a laptop or notebook-sized machine, or give any further details of the arrangement, referring all further inquiries to Apple.

Best Kept Secret of the Year Nomination: Sony-Apple Deal

Do more. Work less.

Yo! We've got the "do more" part down. Could you explain the "work less" part to us once more?

System 7.0 heralds new era at Apple

Software sets path for future

Apple Computer Inc. has announced the release of its new operating system, System 7.0. This new version of the operating system is a significant improvement over the previous versions, offering a more powerful and flexible environment for users.

Apple is paring 10% of corps worldwide. Company won't reveal number of local layoffs.

Apple Like Ghost Town in Face of Layoffs

Work has virtually ground to a halt at many departments of Apple Computer Inc., as employees await the arrival of a new wave of layoffs.

Jeez: With new eras like this we may never ship system software again.



Francis Ford Mac
Most Gratuitous Use of a Mac as a Prop in an Interview Award to Francis Ford Coppola in the public television program "Memory & Imagination."

This would be one of a thousand points of light?
Embezzler with coke and his Mac. Roger McGuinn's "King of the Hill" music video.



The Mac in Film



Yuppie Puppy Dog Care
At last, someone actually using a Mac. Yuppie dog care center with Mac.



As if Star Trek sequels weren't bad enough:
Star Trek: The Next Generation. Apple Computer spends a fortune making a "Star Trek"-style promotional film.

The Power to Crush Other Kids
Truth in Advertising Award to "Saturday Night Live" for its satire of a Macintosh ad.

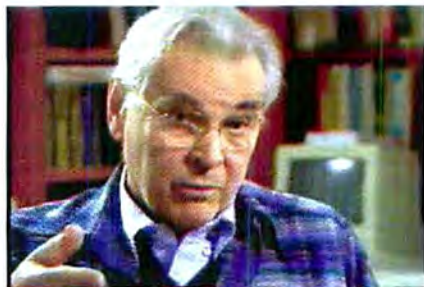


Only Sighting of an LC in a Video Award
Marsha Mason's family in the television series "Sibs." Perhaps that explains initial slow sales of the LC?



Pedagogue as Demagogue
Special Award: Leni Riefenstahl School of Film. Apple Computer commercial.

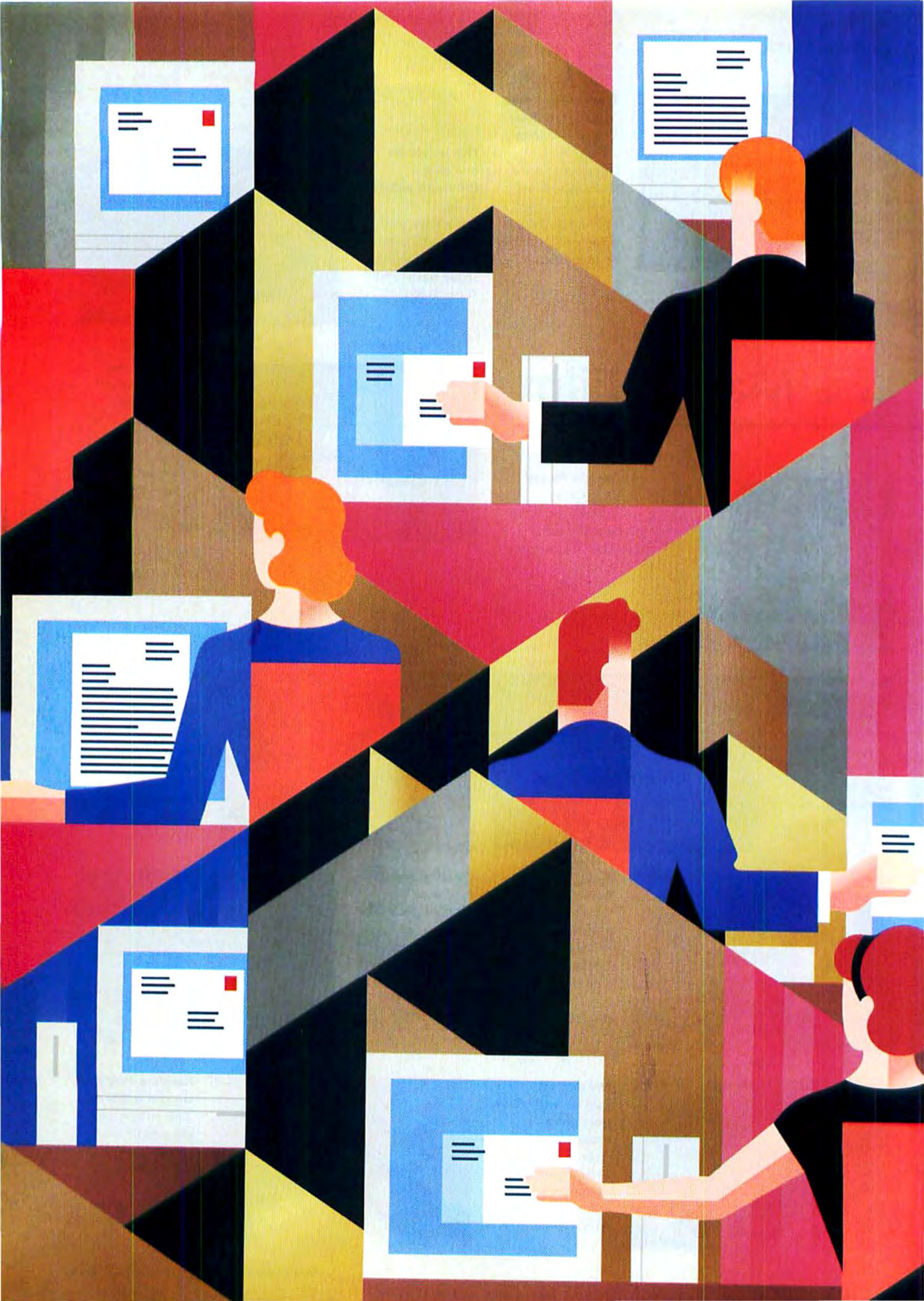
Classical Mac
Professor Bill McNeill, one Mac user we can respect, interviewed in the PBS series "Columbus in the Age of Discovery."



My dad's a psycho and we've only got a crummy IIGS.
Arnold Schwarzenegger comforts a student in *Kindergarten Cop*.



Here's a Mac user we can relate to.
The computer for the rest of us, now typified by users like Gilbert Gottfried. 3rd Bass's "The Gas Face" music video.





O P E N I N G U P

E-MAIL

Macworld Lab takes five E-mail packages for a spin

E

LECTRONIC MAIL, OR E-MAIL, HAS ENTERED THE Macintosh mainstream. With more than 450,000 Mac E-mail users, E-mail is fast becoming a necessity for office environments. Since the last time we took a close look at Mac-based E-mail (see "E-Mail: A Postal Inspection," June 1990), two new players from the DOS world—cc:Mail and WordPerfect Office—have joined the fight for Mac E-mail users. And the two leading companies offering Mac E-mail, CE Software and Microsoft, have added significant new features to their programs. Macworld Lab put the five major E-mail products through their paces.

cc:Mail

CC:MAIL MACINTOSH PLATFORM PACK, FROM cc:Mail, a Division of Lotus, is a relative newcomer to the Mac E-mail market, although it currently is the best-selling E-mail package for DOS machines. cc:Mail is one of the few programs that lets you send graphics with any message and then view the graphics within the E-mail message without requiring a special form. And when it comes to saving messages, you have three options—save the message as a text file, file the message in cc:Mail format on the server in a user-defined folder, or append the message in cc:Mail format to an archive file on your hard drive. The last two options are particularly useful when you need to send replies at a later date.

cc:Mail lets you create a Post Office Box file for each "post office" (the program's name for a

server) that you connect to. Items like the path to the post office and your name are stored in the Post Office Box file, simplifying the log-on procedure—just requiring a double-click on the appropriate Post Office Box file. cc:Mail also encrypts messages.

These positive features pale in comparison to cc:Mail's shortcomings, however. The program doesn't offer customizable E-mail forms. And cc:Mail is the one program in the group that incorporates all the mail-handling intelligence in each user's Macintosh, rather than in a server. If you want to have the Mac periodically check (poll) the server for waiting mail, you have to install a Notify INIT. Too-frequent polling adds unnecessarily to network traffic as the INIT polls the server to find that no mail's waiting.

In its latest version, cc:Mail for the Mac has an improved interface that is more Mac-like in its treatment of windows and menu options. But if you want more than just a simple E-mail system for your local area network (LAN), and choose to install gateways to other systems or support more than one server, cc:Mail's DOS origins show through. All of cc:Mail's gateways run only on a

by Dave Kosiur

DOS-based cc:Mail server, although they are accessible to Mac clients. Remote access is also allowed only to DOS servers. Plus, if you want the servers to exchange their user directories to form a company-wide directory, you need another DOS-based cc:Mail option.

Macworld Lab devised a series of tests to measure how long each program takes to save, read, delete, and send messages with or without enclosures; to log on to the mail server; and to send messages during heavy network traffic (see "Enclosure Speed"). Most of the lab's tests showed little performance variation among the products. In two areas where the performance diverged more clearly—sending messages with enclosures and processing simultaneous messages from six different clients—cc:Mail came in second to InBox (see "Simultaneous Messages"). That performance was not good enough to overcome cc:Mail's other inadequacies, however.

InBox

SITKA'S INBOX HAS NOT CHANGED much since its original release as a Sitka product two years ago. It's still packaged in two kits—InBox, which is a part of Sitka's TOPS Network Bundle, and InBox Plus for Macintosh, which is sold separately. You can get your feet wet

with InBox (it supports up to 20 users), but for routing mail between multiple servers or for supporting more than 20 users, look to InBox Plus.

InBox's distinguishing features are variable fonts (although InBox allows only one font per message), user-defined aliases for any address, automatic updates of address files, and the ability to search mail by subject or sender. Like CE Software's QuickMail, InBox Plus allows you to create file-based mail systems on non-Macintosh platforms. Administration is still accomplished via the Macintosh-based program, but this approach allows you to support non-Mac clients on other networks fairly easily. Unlike QuickMail, InBox Plus does not require that the file system be compatible with Apple's AppleTalk Filing Protocol (AFP).

InBox showed the best performance marks in critical areas: it was the fastest E-Mail product in sending messages with enclosures and most consistent in processing simultaneous clients—impor-



Ben Luce, left, Blake Barber, and other students at the Warren Grade School in Warren, Vermont, use QuickMail to communicate with each other, teachers, school board members, and the school principal.

tant points in its favor. But InBox lacks support for sound or graphics within messages, offers no customizable forms, and does not allow remote access to the server. These serious deficiencies greatly reduce its overall standing.

Microsoft Mail

WITH THE INTRODUCTION OF Microsoft Mail 3.0 for the Mac in 1991, Microsoft caught up to the market leader, QuickMail, on most items on a features checklist. Microsoft also made a few changes to its server technology to alleviate network traffic. The company added extensive options to its server reporting feature and an automatic mail-file backup feature for the server.

Many of the changes in Microsoft Mail benefit the user, which is where the program lost points in our past review. For example, you can now create your own personal address book, which contains addresses from the global Microsoft directory and the custom addresses you create (such as to mail a message to an MCI Mail correspondent). Mailing groups can now be defined by either the administrator or the user.

In a major change to the user interface, Microsoft added folders for storing messages in their native Microsoft Mail format. These folders actually exist on the server, not on your Macintosh. The advantage of keeping folders on the server is that you can access any folder from any Mac on the network or over a remote link. Unfortunately, this approach poses a problem for network managers—it uses up server disk space.

Microsoft Mail now lets you send more than one enclosure with a message. You can send as many enclosures as you

E-Mail Checklist

Here are some features to consider when shopping for an E-mail system.

Server architecture In file-based architecture (used in cc:Mail, InBox, and QuickMail on non-Mac servers), the intelligence to run the mail system resides in the client Mac, with only data stored on the server. This makes it easier to place a server on different computer platforms. In server-based architecture (used in Microsoft Mail, QuickMail on Mac servers, and WordPerfect Office), the intelligence of the mail system is divided between client and server, which allows the server to perform automatic maintenance, such as backup.

Message filing To avoid overloading large or busy networks, look to QuickMail, the only program that lets you file messages into mail folders on your own Mac. You'll inevitably forget about messages filed on the server, and waste space. But if you need remote access to your messages, go with server-based message filing for easy retrieval. Along these lines, QuickMail, Microsoft Mail, and WordPerfect Office store a single copy of any message (or enclosure), independent of the number of recipients—further saving server space.

Server management If you're only using one mail server, remote management isn't an issue. But if you have many servers, remote management (offered by all programs reviewed here except QuickMail) can save time by allowing you to handle almost anything from your Mac. Detailed server reports also assist in troubleshooting. Microsoft Mail offers the best detailed, customizable reports; cc:Mail comes in second.

Gateways Links to mainframe- or minicomputer-based mail systems can be important in large corporations. And for companies of all sizes, linking Mac-based E-mail to AppleLink, MCI Mail, or CompuServe can be an important, if not essential, efficiency measure. Using gateways (offered by the E-mail package or by the online service itself) to these systems lets you use your Mac's E-mail interface for all communications—local or international.

E-MAIL ROUNDUP

like, so long as you don't exceed the total kilobyte limit specified by the administrator. Microsoft Mail also allows users to dial in to the server via modem to send and receive mail.

Microsoft Mail's test results were its main weakness; it was the slowest for processing simultaneous messages, and also trailed the leaders by a wide margin in enclosure speed tests. If Microsoft can find a way to move its messages faster, Microsoft Mail's excellent feature set will make it a strong contender.

WordPerfect Office

WORDPERFECT OFFICE 3.01 FOR MACINTOSH, from WordPerfect Corporation, is a long-awaited newcomer to the Mac market. This new system combines four desk accessories for E-mail, scheduling, note taking, and file manipulation. The E-mail and scheduling DAs work together particularly well.

The complete package offers some innovative features. For example, WordPerfect Office can track a message that you've sent and tell you if the servers have received the message, which recipients have read the message, and who has deleted it. All of this is accompanied by the date and time of each action—a handy tool, and more detailed than QuickMail's mail log. (Offices that use this feature might want to establish guidelines, however, to ensure that it is not used to invade individual privacy.)

WordPerfect's experience with DOS-based office automation has helped it incorporate some interesting security features that its competitors lack. For example, you can conceal the subject for a message when it's sent so that the recipient will see it only when he or she opens the message. You can also add a security label to any message to inform the recipients of the message's degree of sensitivity; but unfortunately, options for encryption and hiding the subject must be handled separately. You also can encrypt a message so that only the recipient can read it using the WordPerfect Office client software—a message intercepted on the network would be unreadable.

Like Microsoft Mail, WordPerfect Office's E-mail lets you store messages in folders kept on the server. You can enclose up to 100 files with any message, with no size limits.

One of the major changes in the E-mail interface over the past two years has been the introduction of customizable forms. QuickMail probably has the largest variety of forms, but WordPerfect Office outdoes QuickMail by providing full support for color in the forms. This customizability extends to the messages

Product	cc:Mail	InBox	Microsoft Mail 3.0	QuickMail 2.5	WordPerfect Office
Vendor	cc:Mail Division of Lotus	Sitka	Microsoft	CE Software	WordPerfect
Price	\$495, 25 users \$595	20 users \$299; InBox Plus: 50 users \$995, 100 users \$1995	mail server \$395, 5 users \$395, 20 users \$1349	5 users \$399, 10 users \$599, 50 users \$2499, 100 users \$4699	\$149, 5 users \$495, 20 users \$1495
CLIENT					
Notification options	audio and/or visual alerts	audio and/or visual alerts	audio and/or visual alerts	audio and/or visual alerts, open DA	audio and/or visual alerts
Create messages offline	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/> (for personal addresses only)
Customizable message forms	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Send graphics in message	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Send sound in message	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Number/size of enclosures	20/no limit	no limit/no limit	no limit/set by manager	16/2MB	100/no limit
Encrypted messages	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Public message board	<input checked="" type="radio"/> (10 max)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> (1 max)	<input type="radio"/>
Conferencing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Filing of messages	on server; archive to local hard drive	on server or local hard drive	on server	to local hard drive	on server
Search messages by subject or sender	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SERVER					
Remote access to server	DOS only ²	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	DOS only ²
Server architecture	file-based	server-based or file-based	server-based	server-based (Mac), file-based (others)	server-based
Server-initiated WAN connections	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Remote management of server	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Copies of message stored	1 per message	1 per addressee	1 per message	1 per message	1 per message

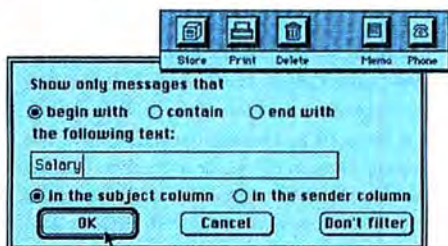
● = yes; ○ = no. ¹ Graphics can be used in forms. ² With additional software from E-mail vendor. ³ With third-party software.

themselves, as a WordPerfect Office user can select any available typeface and size on a character-by-character basis.

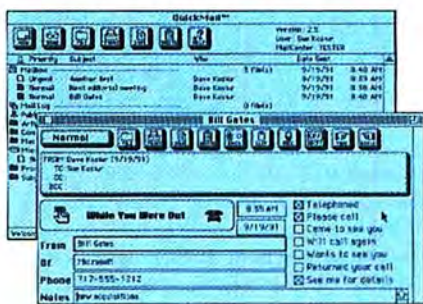
This package scored near the top in tests involving sending messages with enclosures, and was the fastest for sending messages only, although it placed in the middle of the pack for processing simultaneous messages.

Like cc:Mail, however, WordPerfect Office suffers from DOS roots. While Macintosh and DOS clients can use the same server whether the server is running on a Mac or DOS PC, additional features such as remote access and gateways to other systems can run only on a DOS-based server.

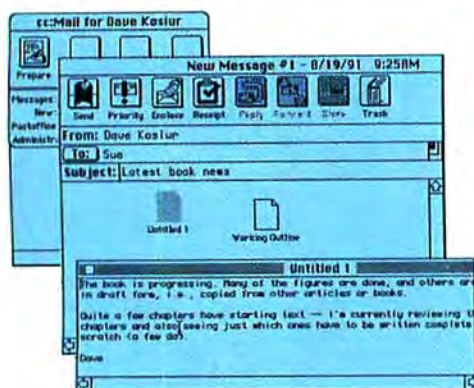
WordPerfect Office's addressing scheme also leaves something to be desired. Setting up custom addresses is awkward; you must include in the address the entire path to the server and any associated gateway, such as MacCS:PCHost:EZLGate:Fax:"801-555-1234/cover page." What WordPerfect Office needs here is a point-and-click method for constructing the address. (One good thing can be said for WordPerfect Office's addressing scheme—it's extremely flexible; in the above example, the stated path also includes the phone number for a fax and the selection of a cover page.)



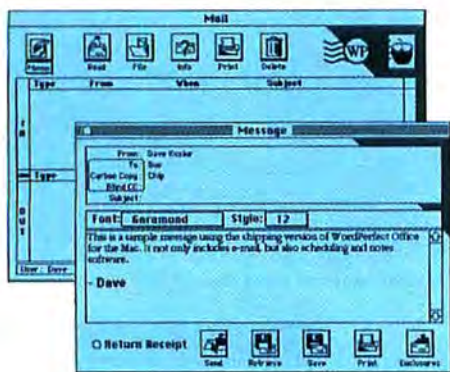
InBox InBox can search subject or sender lists for specific words, as shown here. The InBox interface is simple and uncluttered, with only two message types (Memo and Phone, as shown in the command bar at the top).



QuickMail QuickMail 2.5 added a Mailbox folder for incoming mail (see top line of rear window); the folders below the Public icon are user-defined. The front window is an example of QuickMail's standard phone-message form.



cc:Mail cc:Mail displays messages and enclosures as separate icons below the address space. In this example, the message icon has been opened to display the text of the message. An enclosure named Working Outline is also part of the mail. Unlike some of its competitors, cc:Mail does not offer customizable message forms.



WordPerfect Office The front window is the standard memo form; all forms let you size and style text character by character, as shown here. The pop-up menus in the middle of the form (labeled Garamond and 12) display all available fonts and sizes when clicked on. WordPerfect Office also provides full support for color in all forms.



Microsoft Mail The rear window of this display shows one of Microsoft Mail 3.0's new features—folders for storing messages. You store messages simply by dragging them to the appropriate folder, just as on the Mac's desktop, although the mail folders reside on the server. The column of icons at the left represents the types of messages that can be sent—the fifth icon in the list is for an AppleLink gateway. The front window shows Microsoft's new interface for setting user preferences.

Overall, this is a program to watch, if WordPerfect can alleviate these problems in future releases.

QuickMail

I SELECTED CE SOFTWARE'S QUICK-MAIL as the top E-mail product in 1990. With version 2.5, CE Software has improved its user interface and created more-robust server and telecommunications architecture.

The user interface now includes a folder for incoming mail in addition to personalized folders. However, QuickMail departs from the usual desktop interface—instead of dragging mail to folders in order to file a message, you use a pop-up menu.

Network managers should welcome QuickMail's feature—unique among the products reviewed here—of filing user messages on their own disks, rather than on the server, freeing disk space on the server. (This can be a prob-

MW

EDITORS' CHOICE

QuickMail is the easiest program to use in a mixed network of Macs and DOS machines. It has average speed, but QuickMail offers excellent user-interface and network-administration features and has greatly improved remote-access abilities.
Company: CE Software. List price: \$399 (five users).

lem in one case, however—when a remote user wants to see an old message that's been filed on a Macintosh in the home office.)

Passing messages to others now has more flexibility than before. If you care to forward a message, you can attach comments—something I longed for in past versions. And replies can be directed to the originator, the sender only (as in forwarded mail), or all original recipients. QuickMail also offers an online conferencing mode.

The Future of Electronic Mail

Before long, E-mail as we know it will probably disappear. Rather than use an E-mail desk accessory or application to send messages with enclosures, we'll probably all send and receive electronic messages within our regular applications. The first steps in this direction, at least for Macs, are the Application Programming Interfaces (APIs) offered by Microsoft and CE Software for their E-mail products.

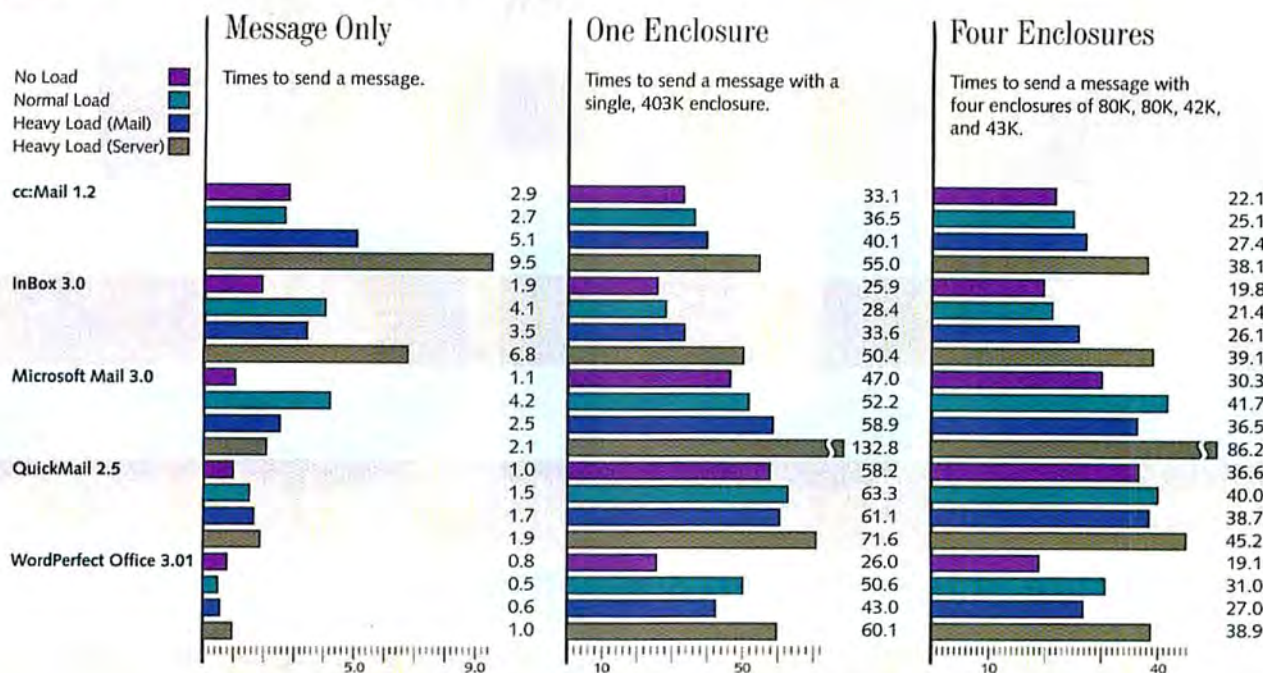
As noted in the past review of E-mail products (see "E-Mail: A Postal Inspection," June 1990), some applications, such as Microsoft Excel, Microsoft Word, and Aldus PageMaker, had used the APIs to add E-mail support to their programs. You could send data from one spreadsheet to another, or place incoming mail directly into a page layout. But that's only the beginning of an important trend.

Our glimpse into what the future holds after such APIs is colored by some of the features of System 7, namely AppleEvents and interapplication communication (IAC). By using the AppleEvent Interapplication Messaging (AEI/M) interface, programmers can write their programs to exchange data, messages, and common commands (such as Save, Open, Quit) with other programs that accept AppleEvents. With AEI/M and Apple's networking support in System 7, this exchange of AppleEvents can happen between networked Macs.

Currently, E-mail programs offer two essential services missing from AppleEvents and IAC—directory and store-and-forward. But each E-mail package handles those services in its own way. Users of one package can communicate with users of another only through gateways—software protocols that vary in quality and speed and must be re-created for each package. Apple says that its recently announced Open Collaboration Environment (OCE) will simplify network communications by providing common directory and store-and-forward services, as well as adding encryption, and authentication—digital verification of who sent a message and that it has not been tampered with.

Compatibility problems between E-mail packages would end, because OCE would mediate all mail handling, passing messages through APIs. E-mail vendors could concentrate on improving the user interface and server reliability. Apple says it is working closely with E-mail vendors to ensure smooth upgrades when OCE ships. Apple also plans to integrate the Open Messaging Interface (OMI), a cross-platform messaging standard, as an API. OMI, developed jointly by Lotus, Apple, and IBM, should let users of the OCE exchange data and messages with users of DOS, Windows, Unix, and OS/2 computers.

Because any application—not just E-mail—could access the OCE, it could make message services intrinsic to all applications, opening new opportunities for collaborative computing across great distances.—Dave Kosiur and Charles Piller



WordPerfect Office was fastest for the Message Only test; for enclosures InBox had the overall fastest times, followed by cc:Mail and WordPerfect Office.

All tests were run with a single mail server installed on a Mac IIci that was

also an AppleShare 2.0.1 server and with Mac IIcx clients. Under No Load conditions, only the test client was attached to the server. For Normal Load, macros simulated the traffic of a 100-node network. For Heavy Load (Mail), macros

simulated a heavy work load for the mail servers by deleting many messages during testing. For the Heavy Load (Server) test, a macro copied a 403K file from the AppleShare server during testing.

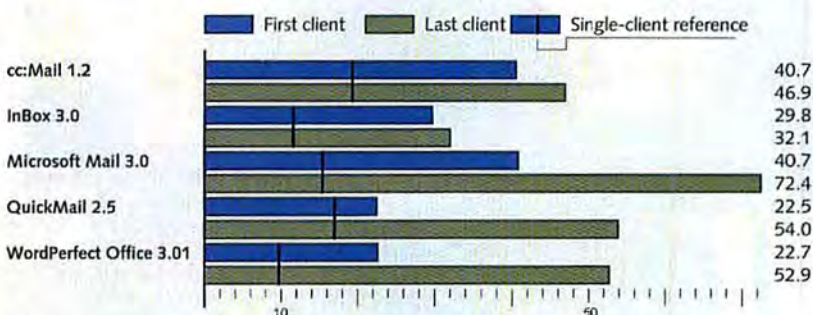
QuickMail 2.5 has switched over to storing a single copy of any message or enclosure on the server, regardless of the number of addressees. This approach, which has been adopted by most other mail programs, saves space and reduces disk fragmentation.

One of the major problems with older versions of the QuickMail was its handling of modem links, both between servers and for remote users dialing a server. Garbled messages, interrupted sessions, and incomplete file transfers were fairly common. To solve these problems, CE Software switched over to using Apple's Communications Toolbox, which should prove more robust than the original QuickMail code (other telecom programs have used the Communications Toolbox reliably). And to make the remote user's task easier, the QuickMail Remote application was rewritten from the ground up—it too uses the Communications Toolbox and now sports an interface that's almost identical to that found in the regular QuickMail application (or DA if you're still using any System below 7.0).

QuickMail is the easiest program to use in a mixed network of Macs and DOS machines, because the server and client software for both operating systems are included in the same package. QuickMail further eases use in mixed networks by letting you install file-based

Simultaneous Messages

Times are in seconds.



To determine the programs' consistency of performance when a server is forced to queue messages, we timed the first and last finishers among six clients simultaneously sending a 512-byte message with an 80K enclosure. (For comparison, we timed a single client sending the same message.)

QuickMail and WordPerfect Office were the fastest in processing the first of the six clients, but InBox and cc:Mail showed the smallest gap between the first and last clients. This suggests that the latter two products perform more consistently under heavy traffic conditions. InBox was the fastest to process all six clients.

E-mail servers on any AFP-compatible file servers. (The only caution: you must have at least one Mac running the QuickMail Administrator program.)

In our lab tests, QuickMail responded sluggishly in enclosure speed tests, and was about average when taking on simultaneous messages. But overall, with its combination of excellent user and administrator features, its ease of use in a mixed network environment, and its

improved remote access abilities, QuickMail retains its superiority in an increasingly competitive E-mail market. **m**

See *Where to Buy* for contact information.

Contributing editor DAVE KOSIUR covers Macintosh networking. He is coauthor of the *Macworld Complete Networking Handbook* (IDG Books Worldwide, 1992).

Macworld Lab testing supervised by Tim Warner.

New tools mean instant

Quick

In the future, it is said, everyone will be famous for 15 minutes.



PHOTOGRAPHS BY ROBERT HOLMGREN

AT COLOSSAL PICTURES IN SAN FRANCISCO, JIM KOULIAS IS INVESTIGATING THE USE OF QUICKTIME FOR PRODUCING ANIMATION AND SPECIAL EFFECTS FOR BOTH TELEVISION AND MOVIES.

Right now, thanks to Apple's QuickTime, you can take a step in that direction by starring in your own 15-minute movie on the Mac's screen. (Well, maybe you'd better start with a 1.5-minute effort; QuickTime movies take up a lot of space.) Sure, the movie will appear in a small window, and it may look slightly choppy, but who's complaining? After many years of hype, digital video is finally real. You don't have to be a trained video editor to make movies on the Macintosh, and you don't need to buy expensive video-editing hardware or pay for sessions at a professional editing studio. With an investment of less than \$1000 (for a minimal setup), owners of any Mac model with a 68020 or higher CPU (and eventually any Macintosh) can import video clips and create, edit, and view QuickTime movies.

The beauty of these programs is that they're aimed at both video illiterates and video professionals. Even if you're just a beginner, you'll be able to drag icons around to do things like arrange scenes, alter a sound track, and add special effects.

In this article, I look at several QuickTime moviemaking products to give you an idea of what it takes to make movies on the Mac. (For information on additional video-related products, see "QuickTime Companions.")

QuickTime Basics

QUICKTIME IS NOT A PROGRAM, BUT rather a software architecture that lets developers incorporate time-based, or

movies on the Mac

Time

dynamic, media types—sound, video, and animation—as well as still images, into applications. Thanks to QuickTime, video is now a data type (like PICT images or text) that can be included in documents and copied and pasted between them. In addition to supporting time-based data, QuickTime supports compression schemes for animation, digitized photos, video, and graphics that make it feasible to compress these storage-hungry elements and automatically decompress them only when they're being viewed on screen.

In addition to supporting Apple's compression schemes, QuickTime's Component Manager and Image Compression Manager let other companies develop their own compression/decompression components (called *codecs*) and drop them into the System for higher rates of compression or specialized support for unique features. Compression schemes vary; some offer a high degree of compression at the expense of image quality. You should experiment with different codecs to see which compression method suits your needs.

QuickTime is currently a System extension but will eventually be incorporated into Macintosh system software. For a more complete explanation of QuickTime, see "QuickTime in Motion," *Macworld*, September 1991.

Just before the final version of QuickTime was released—and the first round of programs to make use of it came out—I looked at prerelease versions of several digital video products. The descriptions that follow are *previews*,

not reviews, since both the programs and QuickTime itself were still under development. If you want hands-on demonstrations of some of the applications described here, you can purchase Apple's QuickTime Starter Kit, which should be available by the time you read this (the price had not been determined at press time). The kit includes the QuickTime INIT, several utilities, and a look at what QuickTime can do. The kit's third-party shopping catalog features working (but limited) versions of several of the programs described here, and descriptions and demos of others. Also in the kit are reusable short videos and animations (like moving clip art), as well as sounds

by Erfert Fenton

plus three handy utilities from Apple: SimplePlayer for opening, playing, cutting, copying, and pasting movies (see "Apple's SimplePlayer"); Convert-to-Movie for turning PICS animations, Scrapbook sequences, PICT, SND, and AIFF (Audio Interchange File Format) files into movies; and PICT Compressor, which will perform JPEG compression on PICT images that will be readable in any application that currently supports PICTs. (JPEG stands for Joint Photographic Expert Group and is a compression standard for still images, including single frames of digital video.)

QuickTime movies, like other high-end graphics applications, currently leave owners of low-end Macs in the dust. In addition to the QuickTime System ex-

Photos



The QuickTime Team Pictured here, from left to right, are a few of the hardworking team members: George Cossey, Chris Thorman, Gary Woodcock, Jim Batson, Peter Hoddie, Bruce Leak, Sean Callahan, Mark Krueger, Lee Mighdoll, Ken Doyle, and David Van Brink as the pink flamingo.

tension, digital video applications require a Mac II or LC with at least 4MB of RAM (8MB is recommended); a color graphics board; 32-bit QuickDraw; and System 6.0.7 or later. If you want to import your own video clips, you need a video-capture board and a camcorder or videotape deck. You need plenty of space on a hard drive to store your movies; even with file compression, a few seconds of digital video can easily take up several megabytes of space. And make sure to defragment your hard drive regularly—fragmented drives slow down video capture.

My video editing setup certainly met my husband's practical definition of multimedia, "it's multimedia if you need to make more than one trip to the car when taking it somewhere." I used a Mac IIsi with 5MB of RAM, an 80MB hard drive, and a 24-bit video board; a removable-cartridge drive and several 44MB cartridges; a video-capture board and RCA jack for video input; a video 8 camcorder; and an external speaker so that I could listen to the audio portion of my tape during capture. Optional, but handy, equipment included an 8mm videotape deck and a CD ROM drive. Once I got the equipment set up, I bulldozed all the extraneous files off my hard drive to make room, dug out a few dozen camcorder cassettes I'd recorded over the years, and proceeded to make some movies. Jumping into video editing was easier than I expected, although it took me a while to wrestle with the numerous hard-

ware components, cables, power cords, and video jacks that made up my system (the back of my Macintosh looked like a nest of snakes engaged in a spaghetti fight). I had to do some homework on the software end of things as well, actually resorting to reading manuals, but the programs I looked at were on the whole well designed and easy for video beginners to learn.

Video In

THE FIRST STEP IN MAKING A DIGITAL movie is to convert analog video to digital format with a video-capture board. I looked at two boards, SuperMac Technology's VideoSpigot Pro and RasterOps' 24STV. Other video-capture boards are available from Computer Friends, Radius, Neotech, E-Machines, Mass Microsystems, VideoLogic, and others, although I didn't get a chance to look at them for this preview article.

With a video-capture board installed, you can attach a camcorder or VCR to the Mac and digitally record videotapes in 8-bit or 24-bit color. Video can be digitally recorded and played back via QuickTime applications at 1 to 30 frames per second (fps), including mono sound, in a window that ranges from 160 by 120 pixels to 320 by 240 pixels.

I also looked at several QuickTime video-capture and editing programs in various stages of development: Light Source's MovieTime, SuperMac Technology's ScreenPlay (included with the

VideoSpigot board series), Adobe Premiere, DiVA's VideoShop, and Letraset's MediaBlender.

Light Source's MovieTime software works with NEC's \$2100 PC-VCR (a computer-controlled S-VHS/VHS videocassette recorder) and a video-capture board such as RasterOps' Video ColorBoard 364 (\$1099), 24STV (\$1799), or 24XLTV (\$3999). The MovieTime application provides on-screen buttons to control the PC-VCR as you record scenes from videotape at 1 to 15 fps. As you view the video on the screen, you mark beginning and end points for a clip. You can use on-screen buttons to fine-tune the in and out points; the PC-VCR achieves frame accuracy by placing digital time code on the videotape to mark the location of every frame. To improve the quality of the digital movie, MovieTime *oversamples* video as it's captured, recording frames at a large size and then reducing them to remove artifacts. It also employs *frame differencing*, which reduces the size of a movie and increases the frame rate by storing only the differences between frames, rather than each whole frame. Once a video is converted to digital format, you can save it as a QuickTime movie and play it back in any application that supports QuickTime.

SuperMac Technology provides another way to capture video and save it in QuickTime movie format. SuperMac's VideoSpigot board (\$499 for Mac IIsi or LC version; \$599 for a NuBus version for other Mac II models) is a 24-bit color digital frame-grabber that captures video in real time from a TV set, laser disc player, videotape deck, or video camera. VideoSpigot Pro (\$1899 for Mac IIsi; \$1999 for NuBus version) includes a frame-grabber and display board: 8-bit graphics on large-screen displays (19- or 21-inch) and 24-bit graphics on small-screen monitors (12- or 13-inch), as well as a QuickDraw graphics accelerator. VideoSpigot comes with SuperMac's own codec, which offers a higher rate of compression than Apple's video compressor. A companion program called ScreenPlay lets you view a video sequence on the screen, mark beginning and end points for recording, save the clip as a QuickTime movie, and trim the movie by adjusting beginning and end points (see "SuperMac's ScreenPlay").

Video Editing

THE BOARDS AND PROGRAMS MENTIONED in the previous section let you capture and save video clips, but there's more to moviemaking than just amassing raw footage (or perhaps "raw bittage" in

this case, since we're dealing with digital information instead of film or videotape). You'll want to arrange clips in a particular order, add or delete sound, and perhaps add special effects. That's where video editing programs come in. I looked at three such programs, Adobe Premiere, DiVA's VideoShop, and a simple little utility called (for now, at least) MediaBlender.

With Adobe Premiere (\$495) you can import QuickTime movie clips, graphics, and animations and assemble them into a QuickTime movie. The program has several windows for movie construction and editing. You import clips into the Project window, where a color *picon* (picture icon) of the first frame in the clip appears, along with information on the clip's file type, image size, and duration. You can type additional comments about each clip if you wish. Once you've imported all the clips you need, you place each one by dragging its picon to the appropriate track in the Construction window (see "Adobe's Premiere"). The Construction window has A and B video tracks (allowing you to create transitions between scenes), a special-effects track, a superimpose track, and several audio tracks. Special effects include filters (you can use the program's built-in filters or

create your own in Adobe Photoshop) and scene-transition effects such as wipes, fades, and dissolves.

I made a few QuickTime movies using a preliminary version of SuperMac's VideoSpigot Pro board and a prerelease version of Adobe Premiere. Except for the glitches one expects in prerelease products, the process worked quite well. Although my test movies were fairly short, consisting of four or five clips and a few scene transitions each, effects like fades and dissolves made me realize I could create something that resembled a short movie, rather than just a series of clips strung together. I realized how much I was enjoying myself when I passed up a chance to go to the movies, telling my pals I'd rather stay home and make my own.

DiVA's VideoShop (\$595), like Adobe Premiere, lets you assemble a sequence of stills, animations, and digital video clips into a QuickTime movie. Designed for Macintosh users rather than video editing professionals, the program uses Mac terminology and techniques (dragging icons, for example) whenever possible.

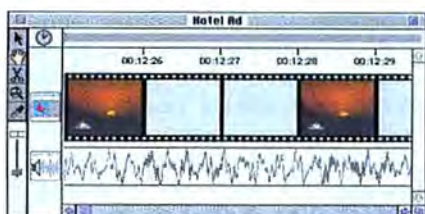
Unlike Premiere, VideoShop can capture video directly from a camcorder or VCR if you have a video-capture board such as RasterOps' Video ColorBoard 364 or 24STV. You might also want to use video clips from the Image Bank CD Collection, a CD ROM library of QuickTime movie clips that is included with VideoShop. The program has a Find command that helps you locate clips from the dozens you may have available on a hard drive or CD ROM.

In addition to incorporating video and animations, you can also make movies from other applications with the program's Screen-to-Movie utility; for example, you might want to add animation to an Excel pie chart for a business presentation.

VideoShop displays available video clips as *micons*, moving icons that play an abbreviated version of the associated video. You drag micons for the clips you want into the program's Sequencer window, which initially consists of one video track and one audio track (see "DiVA's VideoShop"). Adding tracks allows you to create scene transitions or superimpose one clip on another. You can even resize and reposition a clip to create a video inlay; for example, you could show an animated graphic in the upper left corner to help illustrate a concept presented in the main video window. VideoShop's special effects include filters (from VideoShop or Adobe Photoshop) and transition effects such as fades and dissolves. You can play your



Adobe's Premiere Premiere offers two video tracks, allowing you to apply special effects such as wipes, dissolves, and fades between scenes. You can also apply masks using Photoshop's alpha channel to superimpose one clip on another.



DiVA's VideoShop The Sequencer window of DiVA's VideoShop initially offers one video and one audio track. You can add more tracks as you put together a movie.



A Moving Epistle Thanks to a public domain utility called Wild Magic, you can paste video clips into many types of documents, just as you can copy and paste PICT images today.

final movies from VideoShop or other applications that support QuickTime movies, add them to an interactive HyperCard presentation (VideoShop includes a command that lets you place video clips as buttons into HyperCard stacks), or even print to videotape if you have a video-out board installed.

MediaBlender, from Letraset, is pretty straightforward; the utility lets you split a QuickTime movie into segments, allowing you to trim the movie or rearrange scenes. Check with Letraset



Apple's SimplePlayer Apple's SimplePlayer allows you to play back QuickTime movies created in a number of programs.



SuperMac's ScreenPlay ScreenPlay lets you view live video on the screen as you capture it, trim a video clip by adjusting its beginning and end points, and save the clip as a QuickTime movie.

for current marketing plans; at press time these were in flux.

Wild Magic

WITH ALL THE PRODUCTS I HAD TO play with, the most fun I had was provided by a little utility called Wild Magic, which is the work of Jean Eric Garnier, David Fischer, and the Apple France Developer Group. This Control Panel device allows you to paste QuickTime movies into just about any program that accepts PICT images.

You simply open a QuickTime movie with a player utility (Apple provides one in the QuickTime Starter Kit), choose Select All, and copy the movie. Then, open any document and paste in the movie. In the document, you'll see a color graphic with an arrow button. Click on the button, and a set of playback controls appears: play, stop, forward, reverse, and volume (see "A Moving Epistle").

I got quite a thrill out of pasting a five-second movie into a Microsoft Word document (which is either a reflection of how wonderful this utility is or a sad comment on the quality of my

life). The word processor document, movie, Wild Magic cdev, and QuickTime INIT all fit onto a single 800K floppy. Somehow pasting a movie into a letter, copying the letter and its associated movie onto a disk, and playing the movie back on another Mac made me realize that digital video is actually here.

Wild Magic will be available on various online bulletin boards and through user groups. The program is in the public domain, which means that anyone with access to QuickTime movies can paste them into documents and distribute them to friends and colleagues.

Is QuickTime on the Right Track?

DIGITAL VIDEO CERTAINLY HAS BOTH pros and cons. QuickTime movies can be easily transferred from one Mac (II) to another, and you don't need anything extra to play them (you might need a removable cartridge or hard drive to transport them, however). They're stable; you can play or copy a QuickTime movie over and over without affecting the image quality. And if early indications mean much, digital video will be a cost-effective tool in the commercial

video industry, where graphic artists will be able to create video storyboards and comps for much less than it would cost on a professional editing system.

But the image quality of digital video isn't up to broadcast TV standards yet (and is not designed to be within the current architecture of QuickTime); the files take up lots of room (with Apple's compression routine set to medium quality, I managed to fit about four and a half minutes of QuickTime movies on a 44MB removable cartridge); and it still costs real money to put together a serious desktop video workstation.

Right now, a sophisticated Mac-based video-capture and editing system costs several thousand dollars above and beyond the cost of the Mac. A moderately priced system like the PC-VCR (\$2100) adds features like time-code striping and improved image quality through oversampling. High-end systems, like those from Digital F/X and Avid Technology, provide more sophisticated video editing capabilities including frame accuracy with SMPTE (Society of Motion Picture and Television Engineers) time-code striping (the standard for movie and television production time codes) and the ability to create edit-decision lists for assembling finished tape. Although you won't find many people waltzing out and buying a high-end system just to create QuickTime movies, the QuickTime movie format is being added as an output choice for owners of such systems.

Fortunately, digital video quality will only improve with the emergence of new compression and acceleration technologies, mass-storage devices are getting bigger and less expensive, and low-end workstations can be put together; you can slurp in video and create QuickTime movies with a \$499 VideoSpigot board, edit them with a program like Media-Blender (or a more costly but more sophisticated program like Premiere or VideoShop), and paste your results into your existing programs with the free Wild Magic utility.

Digital video still has a ways to go. But even if it needs to get smaller, cheaper, and better before it's widely accepted, it's here now and it works. If you want to get started with the newest data format, the tools you need are waiting for you. ■

See *Where to Buy* under QuickTime Tools for contact information.

QuickTime Companions

Numerous companies have announced new QuickTime movie products or QuickTime compatibility for their existing products.

RasterOps' current video-capture boards will soon be QuickTime-compatible via a new version of their MediaGrabber software, and a new board called MediaTime (\$2799) will support CD-quality audio. Also in development at RasterOps is a video-compression piggyback board called QuickPack, which will allow the 245TV or 24XLTV board to capture full-frame (640 by 480) video to disk.

Radius recently signed a licensing agreement with Apple to use a new video technology called Touchstone in future video products. Developed at Apple, Touchstone includes new technology to produce flicker-free 24-bit video, video window resizing, and an improved bus architecture called HBus (HBus overcomes the performance bottleneck of NuBus, allowing the transmission of 24- or 32-bit data). Radius is expected to introduce products that take advantage of Touchstone in early 1992.

New Video Corporation has announced the EyeQ Delivery Board/Capture Adapter, a \$7500 system that lets you capture and compress full-motion video in real time and play QuickTime movies with stereo sound at 30 frames per second on a screen as large as 16 inches. (By contrast, QuickTime movies typically play in mono sound at 10 to 15 fps in a 160-by-120-pixel window, or at somewhat slower rates in a 320-by-240-pixel window.) The EyeQ board can compress video and sound in ratios of up to 160:1 using DVI, Intel's video-compression and playback technology. Digital F/X will include the board in a future version of its Video F/X video-production system.

SuperMac Technology has announced Digital Film (at press time no price was set), a video processing board that uses JPEG compression and can produce full-screen video at 30 fps with stereo sound.

QuickTime enhancements are available for software developers as well. Storm Technology has announced a JPEG accelerator called QuickPress (\$1500 for developer's kit), which speeds QuickTime JPEG compression by as much as 15 times. The Company of Science and Art (CoSA) offers PACo (\$179), a compression/decompression utility for playing digital video and animations. PACo eliminates start-up delays and reduces the amount of RAM needed to run a digital video movie.

ERFERT FENTON is a free-lance technical writer and a longtime *Macworld* contributing editor. She resides in San Jose, California, with her husband and three Macs.

Images & Tools is a two-day event sponsored by *Macworld* magazine. You will learn firsthand from well-known computer-graphics artists and designers how they do what they do. They'll demonstrate the techniques they use to create high-quality electronic art, and they'll showcase the tools (from Aldus FreeHand to Adobe Photoshop) that help them do it.

Invited speakers will take you through the creative process in their areas of expertise, from concept to finished piece, and then open the floor to questions. Jim Ludtke is a graphic designer and 3-D animator who began his career as an airbrush artist. Ron Chan, formerly with the *San Francisco Chronicle*, illustrates for advertising agencies, design firms, and magazines. Arne Hurty, senior designer/informational graphics at *Macworld*, was the winner of the first Aldus FreeHand illustration contest, published in *Print* magazine. John Hersey is an illustrator whose work has appeared in *Esquire*, *GQ*, *LA Style*, and the *Washington Post*. Erik Adigard, who studied fine arts in France, came to computer illustration through his experience in video animation. Sanjay Sakhuja is president of Digital Pre-Press International, a PostScript-based, state-of-the-art color-separation house. John Knoll, one of the creators of Adobe Photoshop, currently works for Industrial Light & Magic.

Conference registration is \$495 and includes all sessions, conference materials, breaks, and luncheons. Checks must be made payable to Macworld Communications and sent to: Sandy Butler, Events Manager, Macworld Communications, 501 Second St., Suite 500, San Francisco, CA 94107.

For additional information contact the Events and Conferences department; 415/267.1745.

fax 415/442.0766.



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+

THURSDAY, APRIL 30 &
FRIDAY, MAY 1, 1992

AT THE

MARK HOPKINS

INTER-CONTINENTAL
HOTEL.

SAN FRANCISCO

+

3D STRUCTURE, SURFACES, AND MOVEMENT

3-D MODELING HAS COME A LONG WAY TOWARD BEING

When I first discovered a few years ago that I could create photo-realistic three-dimensional graphics on the Mac, my imagination fired. I visualized magnificent marbled structures, bizarre 3-D characters, and futuristic-looking cars and spaceships. But the memory and processing limitations of the Mac and the lack of high-end software forced me to scale back my expectations—I decided to start by creating a graphic of a truly reflective but transparent sphere.

OK, I admit it. I'm talking about a simple glass ball, but even this proved challenging. I created the sphere, set a camera angle, defined the glass surface properties, and told my Mac to render the image. Ten hours later my Mac beeped to signal that it was done with the task. I opened the file to see what I had

created, only to be confronted by a murky gray circle, not at all close to the shining orb I had expected.

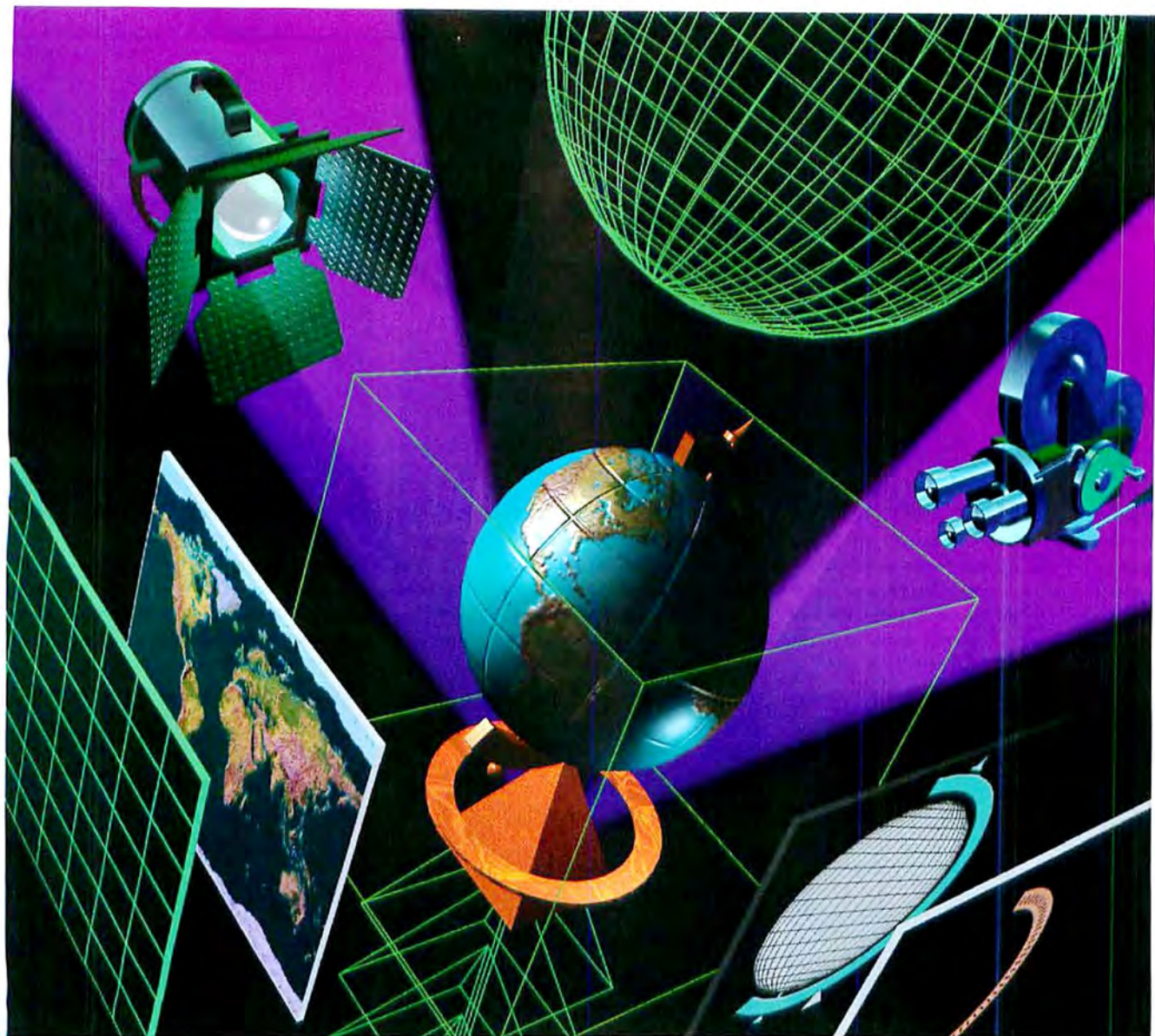
The capabilities of the Mac and of 3-D software have changed a lot since then. And although 3-D modeling, rendering, and animation are still young fields, a variety of solutions for creating 3-D graphics on the Mac have appeared. My struggles with the glass ball have turned to struggles with much more complex images—birds flapping across the screen and characters lip-synching to an audio track.

Modeling Basics

ALL 3-D PROGRAMS OFFER EASY ACCESS to a variety of primitive shapes—such as spheres, cylinders, cones, and cubes—that you use as building blocks. And all

3-D programs let you take a 2-D outline, such as a font or logo, and push, or *extrude*, it into 3-D space to give it depth. Beyond these basic elements, each modeler has various tools for creating more-complex objects.

Most low- to mid-price packages support either *latbing* or *cross-sectional* modeling (see "A Visual Guide to Features" for definitions of modeling terms). Programs that use the lathe technique offer slight variations. With Aldus Super 3D, for example, you can edit the location of points on a finished lathed object via the reshape command. While you can't edit lathed objects with StrataVision 3D and Ray Dream Designer, Ray Dream lets you extrude a spline curve along a Bézier path, with the option to resize the outline at various points along the object. All



JIM LUOTTE

TRULY USEFUL, BUT RENDERING TIMES ARE STILL SLOW

three programs are adequate for entry-level modeling.

In contrast, MacroMind/Paracomp's Swivel 3D Pro uses cross-sectional modeling. Once you understand the basis of cross-sectional modeling, Swivel is a great tool to use. It provides a quick and easy way to create a variety of shapes, some of which can't be created with the lathing method. Specular International's Infini-D offers both lathing and cross-sectional modeling, but the program's modeler is not as intuitive as Swivel, often producing inconsistent results.

Working on Detailed Images

HIGHER-END MODELERS OFTEN support *spline-based* modeling—a technique that's good for creating smooth curved surfaces. VIDI's Presenter Professional

offers the ability to adjust 3-D shapes with Adobe Illustrator-type Bézier handles. Byte by Byte's Sculpt 3D and 4D and Ray Dream Designer let you build extruded and lathed objects with two-dimensional spline curves. With Sculpt 3D and 4D, you can then adjust the splines in 3-D space. A new program, Alias Research's Alias Sketch, which was released just as this article went to press, allows you to sketch free-form curves and surfaces anywhere in 3-D space. Any portion of a curve can be refined in three dimensions. Alias Sketch costs \$1995.

Spline-based modeling has its limitations, however. For instance, the control points you use to adjust a shape often

govern 20 or more vertices (or individual points) on an object. Each vertex is adjusted every time you move the control point. To adjust a single vertex on an object, you need a modeler that has vertex-level editing capabilities.

AT&T Graphics Software Labs' MacTOPAS, Sculpt 3D and 4D, Swivel 3D Pro, Aldus Super 3D, and autodessys's Form Z, offer vertex-level editing. While vertex-level editing provides definitive control over positioning of the various points on a model, it can be time-consuming and exacting work. It's certainly more difficult than using a spline-based modeler, especially when it comes to creating smooth surfaces.

BY DAVID D. POOLE

Making a Model Realistic

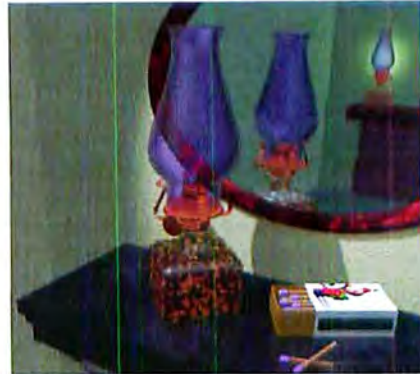
Artist Jim Ludtke created the mantelpiece scene in DXF format. Each company used imagination and product features to render the model.



ElectricImage Animation System The texture maps on the walls and mirror frame were created in Pantechnicon's TextureSynth. Spotlights were used to simulate the lamp's light. The Glossy attribute was used on the globes to simulate the flame's glow. The mirror's glass texture was created in Adobe Photoshop.



Infini-D Texture maps for the walls and mirror frame are from Form and Function's Wraptures CD. The mantel uses a texture map from D'pix's Folio1 CD. The marble is 100 percent color map and 30 percent reflection map. The globe's texture comes with Infini-D. The matches have procedural surfaces.



MacRenderMan Shaders from Showplace Looks and the Valis Group's VG Shaders were used for the walls, mantel legs, wick, oil, metal pieces, floor, globe, and globe base. Texture maps for the mirror frame and mantel were created in Showplace. Reflections in the mirror and mantel were done with MacRenderMan.



MacroMind Three-D For the wallpaper, a scanned image was cropped and repeated. The mirror reflection was simulated by compositing images of the mirror, lamp, and wall. An alpha channel stored transparency data for the lamp so that the background could show through.



MacTOPAS For the lamp and mirror frame, the artist created a cube and assigned it an environmental reflection map. After rendering, the cube was deleted and the map was saved to disk. The map was then used on the mirror frame and lamp. The gold and glass attributes on the lamp come with MacTOPAS.



Presenter Professional The image was reworked to use spline-based objects. The mantel uses a procedural texture; the walls and window use images from Form and Function's Wraptures CD. Note the refraction through the globe and reflection off the mirror—the program created these by ray tracing.



Ray Dream Designer The matches and matchbox use texture maps; the mantel, mirror frame, and wallpaper use solid textures. Note the reflection on the mirror—a single light source gradually diminishes to darkness. The mantel is semireflective; the globe is reflective and transparent.



Sculpt 3D and 4D The interior of the globe uses a cylindrical projection soot map; the matchbox label, sky, and burnt matches use parallel projection maps. Built-in textures were used for the mirror, globe holder, outside of the globe, oil, matchbox, and matches. Other textures were custom designed in Adobe Photoshop.



StrataVision 3D The lamp was remodeled with refracting polygons to give realistic refraction through the globe. A flame map on the wick makes the lamp appear lit. A glow map makes the globe brighter around the flame. Textures for the mantel, globe, frame, and wallpaper come with StrataVision.

All programs that offer vertex-level editing let you drag any point on an object to any location in space. Sculpt 3D and 4D are the only programs that let you move several points at once, rotate or resize them, and perform operations such as extrusions on them. With Sculpt 3D and 4D, you can start from a single point in space and build outward in any direction to create virtually any object imaginable. Sculpt 3D and 4D also allow you to stitch the vertices of two objects together. A word of caution to would-be Sculpt 3D and 4D users: if you're not careful when building with these advanced techniques, it's easy to create objects that looked crude and faceted.

Creating a Surface

ONCE YOU'VE BUILT A MODEL, YOU will want to apply colors and textures to it. Depending on the program's rendering capabilities, you can use a variety of textures: marble, wood, glass, stucco, and downright gooey substances. Surface properties—often described by specular, diffuse, ambient, and transparent coefficients—are the bases for creating surfaces that appear to be glass, plastic, and metal. To create surface properties, you basically adjust the shininess and transparency.

Since real-world objects are made of more than just glass and plastic, you will need to create other textures as well. The most common way is to place a PICT or TIFF image file on the surface of an object; this process is called texture mapping. All the products covered here support texture mapping except Form Z and Aldus Super 3D. The shape of the object and the effect you're after both determine how you apply a texture. For instance, you can use cylindrical mapping to wrap labels around 3-D cans, or

spherical mapping to cover a sphere with a map of the earth. Alternatively, you can use cubic mapping to project the same image file onto all six sides of a cube. Flat projection places an image on a single, flat surface.

Some renderers support procedural textures, computer-generated textures that make an object look as though it has been carved from a solid block of the specified material. Procedural textures, most often used to simulate wood and marble, are extremely useful because you control the colors, size, and distortion of the pattern, and the texture wraps around any object you apply it to. Be forewarned, however, that procedural textures look fake and cheesy if they are not carefully constructed.

Textures and Lights

A SPECIAL TEXTURE MAP, A BUMP MAP, lets you create an irregular surface. Bump mapping uses light and dark values of an image to simulate nicks, dents, or bumps. Bump mapping can add dimples to an orange or a golf ball—effects that are difficult and time-consuming to create by straight modeling.

You can also get the effect of nicks, dents, and bumps with procedural surface displacements—computer-generated bumps that any rendering program that offers procedural textures can create. These are great for simulating the random irregularities found in, for example, stucco and concrete surfaces.

Another type of texture map, a reflection map, creates the impression of a reflective surface such as chrome or metal. With reflection maps, the rendering program projects a user-defined image onto an object from all sides, and the object reflects the image. (Reflection maps are often used in Phong-shading pro-

grams, like ElectricImage Animation System and MacTOPAS, since these programs cannot create ray-traced reflections by calculating.) For things like logos that move in space, reflection maps dramatically enhance the effect of light interacting with metallic surfaces.

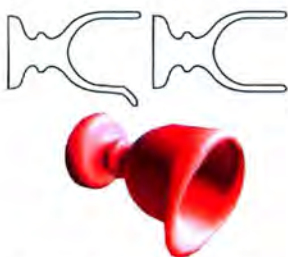
ElectricImage Animation, Sculpt 3D and 4D, and MacTOPAS excel at texture mapping. ElectricImage gives you intricate control when placing a texture over a surface. Sculpt also offers incredible power—you can apply a different texture to every face of a model. ElectricImage Animation, Sculpt 3D and 4D, and Infini-D as well allow you to combine two or more different texture effects on the same surface. Other good texture-mapping programs include StrataVision 3D, Presenter Professional, Ray Dream Designer, and MacroMind Three-D.

After applying textures to a model, you need to light it. Modeling programs offer four basic types of lights: point (which radiates from the center of a source, like lamplight), spot, distant (which creates a continuous band of directional light, like sunlight), and ambient. Almost all programs have ambient light sources, but otherwise, lighting capabilities vary. For example, StrataVision 3D offers all four light types and can generate shadows. MacTOPAS also generates shadows, but only supports ambient and point lights. ElectricImage has all four types of lights but doesn't support shadows (Electric Image says the next version will offer shadows). Sophisticated lighting and shadows can enhance the depth of an image.

Rendering

ONCE YOU'VE BUILT A MODEL AND APPLIED textures and lights, it's time for the Mac to do some work. The three

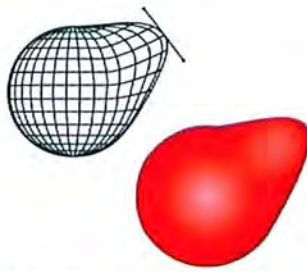
A Visual Guide to Features



Cross-Sectional Modeling Allows you to apply a cross-sectional, 2-D outline to an outline of the top and sides of an object to create a 3-D shape (see "3-D Programs at a Glance," for products with this feature).



Lathing Allows you to take a 2-D outline and rotates it 360 degrees to create a 3-D shape. Unlike cross-sectional modeling, lathing cannot produce odd shapes (see "3-D Programs at a Glance," for products with this feature).



Spline-Based Modeling Enables you to smoothly adjust the form of a 3-D object via control points. You move the control points much as you would in a draw program (see "3-D Programs at a Glance," for products with this feature).



Vertex-Level Editing Allows you to select and reposition a single point on a 3-D object. Vertex-level editing gives you maximum control over an object's shape (see "3-D Programs at a Glance," for products with this feature).

basic types of rendering most common to professional modeling and animation programs are Phong shading, ray tracing, and RenderMan. StrataVision 3D also includes radiosity (a technique that takes the color and other properties of a light source into consideration).

Phong shading is the fastest professional way to render images. Phong-shading programs are generally capable of generating smooth surfaces, texture-mapped objects, bump maps, shadows, and different types of lights. A few high-quality Phong-shading programs—such as ElectricImage Animation System, MacTOPAS, and MacroMind Three-D—can create fully antialiased images with lights, texture maps, transparency, reflection maps, and more. Unfortunately, none of these Phong shaders can produce procedural bumps or procedural textures. MacTOPAS can simulate ray tracing by generating its own Phong-shaded version of reflections of other elements in the environment.

Ray tracing is the most popular rendering method because it can render objects with realistic reflections and shadows. Ray tracing, however, can be extremely time-consuming, sometimes taking ten hours or longer to render a single full-screen image. With ray tracing, a rendering program tracks each beam of light in a scene and calculates how that light interacts with each visible surface in the scene. If an image contains glass or reflective surfaces, then the ray-tracing program also calculates where the light reflected from that surface goes. The more lights and reflective or transparent surfaces a scene contains, the more work the rendering program has to do and the more time it takes to render the image. Programs that use ray tracing include StrataVision 3D, Sculpt 3D and 4D,

3-D PROGRAMS AT A GLANCE

	Aldus Super 3D	ElectricImage Animation System	Form Z	Infini-D
Company	Silicon Beach Software	Electric Image	autodesys	Specular International
Price	\$495	\$7495	\$999	\$895
MODELING				
Cross-sectional	●	○	●	●
Lathing/sweep surfaces	●/●	○/○	●/●	●/○
Spline curves/vertex-level editing	○/●	○/○	●/●	○/○
Hierarchical linking/3-D text	●/○	●/○	●/○	●/●
Files in DXF format (imports/exports)	○/○	●/●	●/●	●/○
Exports MacRenderMan RIB files	●	○	○	○
RENDERING				
Ray tracing/Phong shading	○/○	○/●	○/○	●/●
Spotlights/point lights	●/○	●/●	○/●	●/●
Distant lights/fog	●/○	●/●	○/○	○/○
Cubic mapping/bump mapping	○/○	●/●	○/○	●/●
Procedural textures	○	○	○	●
Procedural surface displacement	○	○	○	●
Alpha-channel masks	○	●	○	○
ANIMATION				
Key frame/hierarchical	○/●/●	●/●	○/○	●/●
Metamorphosis/spline paths	●/○	○/●	○/○	●/●
Can animate lights/camera	○/●	●/●	○/○	●/●
PICS file mapping	●	●	○	●
Can animate procedural textures	○	○	○	●

● = yes; ○ = no. ¹ Sculpt 4D (\$3500) includes all of the features that Sculpt 3D does, plus animation capabilities. ² SwivelMan

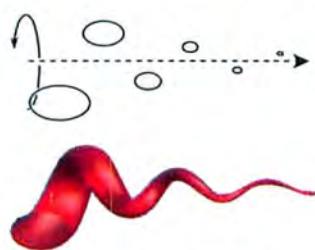
Presenter Professional, Infini-D, and Ray Dream Designer.

Pixar's MacRenderMan uses procedural (or algorithm-based) shading to create practically every element of an image—lights, textures, atmospheric conditions such as fog, and surface displacements. Pixar is trying to position MacRenderMan as the universal 3-D rendering language for all computer platforms, but due to the lack of programs that can fully control all of its features and capabilities, MacRenderMan has received only limited acceptance. Mac-

RenderMan's quality is high; Pixar has used the algorithm to produce several award-winning animations over the past few years.

Most modelers can export either RIB (RenderMan Interface Bytestream, RenderMan's proprietary file format) or AutoCAD DXF files. While only MacRenderMan imports the RIB file format, most rendering programs import DXF files. For programs that don't export RIB or DXF files, you may be able to export files with Kandu Software Corporation's CadMover, a 3-D file-conversion utility.

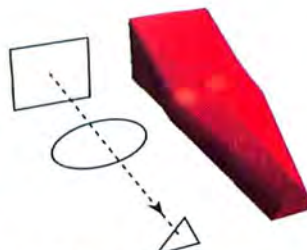
A Visual Guide to Features (continued)



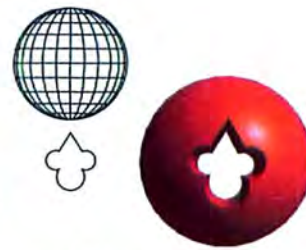
Sweep Surfaces Allows you to sweep a 2-D outline in a circular fashion around a center point while gradually resizing, rotating, or moving the outline in 3-D space (see "3-D Programs at a Glance," for products with this feature).



Extrude along a Path Allows you to extrude a 2-D outline along a curved path to create complex shapes (Form Z, MacTOPAS, Presenter Professional, Ray Dream Designer, Sculpt 3D and 4D).



Loft A form of extruding along a path that allows you to combine several 2-D shapes as cross sections to create a complex 3-D object such as a car chassis (MacTOPAS, Presenter Professional, Sculpt 3D and 4D).



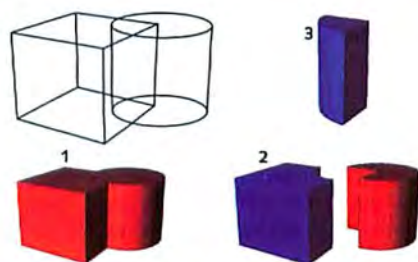
Drill Enables you to take a 2-D outline and use it to drill a hole through a 3-D object. The object then contains an actual hole, not just the facade of one (Form Z, MacTOPAS).

MacRenderMan and Showplace	MacroMind Three-D	MacTOPAS	Presenter Professional	Ray Dream Designer	Sculpt 3D ¹	StrataVision 3D	Swivel 3D Pro
Pixar	MacroMind/ Paracomp	AT&T Graphics Software Labs	VIDI	Ray Dream	Byte by Byte Corporation	Strata	MacroMind/Paracomp
\$995	\$1495	\$7495	\$3600	\$895	\$2500	\$995	\$695
○	○	●	●	●	●	●	●
○/○	○/○	●/●	●/●	●/○	●/●	●/●	●/○
○/○	○/○	●/●	●/●	●/●	●/●	○/○	○/●
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●	○	○	●	●	●	●	○ ²
●	○	○	○	○	●	○	○ ²
●	●	○	●	●	●	○	○ ²
○/○	●/●	●/●	●/●	○/○	○/○ ¹	●/●	●/●
○/○	●/●	●/○	○/●	○/○	○/○ ¹	●/●	○/○
○/○	●/●	●/●	●/●	○/○	○/○ ¹	●/●	○/○
○	●	○	○	○	○ ¹	●	○
○	○	○	○	○	○ ¹	●	○

(\$895) contains these features. SwivelMan is a bundle of two programs: Swivel 3D Pro and Pixar's MacRenderMan.

Time Concerns

RENDERING CAN TAKE A VERY LONG time. Time ranges of half an hour to four hours are not at all uncommon for a full-screen image (640 by 480). Images that will be printed are often rendered at much higher resolutions (say, 4000 by 4000) and can take a couple of days to create. Some companies, such as Strata, are working to enable their products to perform distributed processing—that is, dividing the rendering tasks among several maps in order to speed the total rendering time.



Boolean Operations Let you use one shape to modify another. These operations provide three ways to create images—join two shapes, take the area where two shapes overlap, or take the area where two shapes

ElectricImage Animation System is the only program that doesn't require such long rendering times. It is 10 to 20 times faster than competitors such as Infini-D, Sculpt 3D and 4D, and MacroMind Three-D. Most images that would take several hours to render in another program take a few minutes in ElectricImage Animation, making it a viable animation program. To equal ElectricImage Animation in speed, other programs need to use a render acceleration board, such as Yarc Systems' NuSprint board (8MB \$3700, 16MB \$4700). The Yarc board currently works only with Presenter Professional.

Rendering programs offer a wide range of image quality. Swivel 3D Pro, Form Z, and Aldus Super 3D can't render photo-realistic textures—these programs should be considered for modeling only. Ray Dream Designer and Infini-D are both adequate ray-tracing programs, although finished images tend to have jagged edges that need to be processed through an antialiasing utility like Ray Dream's JAG (\$99.95). StrataVision 3D is one of the best ray-tracing programs I've seen. It produces incredibly crisp images and offers a wide variety of texture and lighting capabilities. Because StrataVision 3D's modeling capabilities are limited, however, the program is best used as an entry-level program for creating sophisticated still images.

Sculpt 3D and 4D are very capable renderers; they can apply a different color or texture to each face of an object. Unfortunately, Sculpt 3D and 4D's finished images occasionally contain jagged edges. Similarly, MacTOPAS is one of the better renderers. It is fast, has great texture-mapping capabilities, and offers sophisticated control over shadows. It has no spotlights. Presenter Professional has a pretty good renderer, with support for good-quality Phong shading and ray tracing. Unfortunately, the ray tracer is quite slow, so you should either stick with the program's smooth Phong renderer or purchase a Yarc accelerator board to ease the ray-tracing render times.

ElectricImage Animation System, MacroMind Three-D, and MacRenderMan are dedicated rendering programs designed solely to render models created by other programs. As renderers, all are excellent. ElectricImage Animation has phenomenal texture-mapping control, allowing up to three channels of image data per object (the more channels a program allows, the more control you have over the appearance of a surface). (Sculpt and Infini-D also allow you to mix surface qualities, a process referred to as compound surfaces.) ElectricImage also has nice spotlight control and fog effects. However, the program can't create shadows, so you may lose a little depth or realism. Worse, at \$7495, ElectricImage

MW**EDITORS' CHOICE****Entry-Level Still Image**

Ray Dream Designer For an entry-level program Ray Dream Designer offers the richest assortment of modeling features, with the ability to create spline-based shapes. Ray Dream also comes with a nice variety of built-in textures. **Company:** Ray Dream. **List price:** \$2500.

StrataVision 3D Another good choice for entry-level still-image creation is StrataVision 3D. Although somewhat limited as a modeler, StrataVision 3D offers the highest-quality ray tracing. **Company:** Strata. **List price:** \$995.

Entry-Level Animation

Infini-D For low-end animation Infini-D offers incredible power, with the ability to animate metamorphosis changes to both textures and models. Unfortunately, Infini-D's modeler is weak. **Company:** Specular International. **List price:** \$895.

High-End Still Image

Sculpt 3D and 4D Sculpt is the most powerful modeling program on the Mac, bar none. Unfortunately, the user interface is tough to learn. Sculpt is also a capable renderer—and in the case of Sculpt 4D, animator—although other programs can perform these tasks faster and more easily. **Company:** Byte by Byte Corporation. **List price:** Sculpt 3D \$2500; Sculpt 4D \$3500.

MacTOPAS MacTOPAS is great for still-image work. Its modeler has spline-based modeling and vertex-level editing, both of which are accessible through a wide array of tools. MacTOPAS's renderer is very good and can create high-resolution files for print, as well as video. **Company:** AT&T Graphics Software Labs. **List price:** \$7495.

Presenter Professional Presenter Professional is a very good spline-based modeler. Although ultimately it doesn't offer the same amount of control as Sculpt or MacTOPAS, Presenter has a full set of modeling tools. Presenter offers the most robust support of MacRenderMan, making the two products a great companion set. **Company:** VIDI. **List price:** \$3600.

High-End Animation

ElectricImage Animation System ElectricImage is the fastest professional-quality rendering program, and its texture-mapping capabilities are extremely sophisticated. Unfortunately, it is extremely limited when trying to animate complex motions, which is certainly a consideration when spending \$7500. **Company:** Electric Image. **List price:** \$7495.

MacroMind Three-D Three-D is the most powerful animation tool. Three-D's score feature gives you total control over animations by allowing you to adjust any parameter of any object at any point in time. Best of all, the program's intuitive approach and sensible interface allow you to work quickly when composing complex animations. **Company:** MacroMind/Paracomp. **List price:** \$1495.

Animation is dreadfully expensive, uses a hardware copy-protection device, and is limited by simplistic animation controls, its only ideal use being that of a flying logo program. (In fact, it has less control than programs that cost a fraction [1/5] of the \$7500 the company charges.)

MacroMind Three-D has great lighting and good texturing control. Three-D's spotlights, which can create shadows, are incredibly powerful, especially when used in animations. Pixar's Showplace, a program that works as a front end to MacRenderMan, offers a friendly point-and-click approach to composing a scene. Showplace comes with a starter set of 3-D clip art and a library of textures. You can also purchase VG Shaders + VG Looks from the Valis Group. VG Shaders is a set of 3-D surface textures such as aluminum or tortoiseshell that you can apply to any MacRenderMan-compatible model. Showplace does not support animation, however.

Animating Images

MOST PROGRAMS OFFER KEY-FRAME animation. You position objects at important, or key, positions and the computer generates all the positions in between. Hierarchical animation is an advanced form of key-frame animation in which you animate the moving parts of a model in relationship to one another. For instance, in a model of a human being, you can link objects so that moving the hip triggers the arms and legs to swing in a walking motion. All programs, however, bog down when you attempt a highly complex animation.

Of the entry-level programs, Swivel 3D Pro is the best for quick prototyping, since it lets you precisely and easily control hierarchical animation. With Swivel, you can constrain the rotation and pivoting of various parts of a hierarchy.



Swivel 3D and MacroMind Three-D The models were created in Swivel 3D and rendered in MacroMind Three-D. Swivel 3D allows you to quickly build objects like the building and the robot, with easy-to-use, powerful linking tools. MacroMind Three-D offers texture mapping (building, billboard, robot eye), bump mapping (ground), reflection mapping (robot body), and spotlights (highlight on billboard).

Professional-level programs that offer intermediate-level animation control include MacTOPAS, ElectricImage Animation, and Presenter Professional. A notable animation feature, offered by MacroMind Three-D, Infini-D, StrataVision 3D, ElectricImage, Presenter Professional, and Sculpt 4D is object metamorphosis—the ability to animate objects along a spline path to create very smooth movement.

Another powerful feature offered by MacroMind Three-D, Infini-D, MacTOPAS, Aldus Super 3D, StrataVision 3D, and Sculpt 4D is object metamorphosis—the ability to animate the shape of an object changing over time (showing, for instance, a flower bud opening). Infini-D's metamorphosis is extremely powerful, allowing you to animate from one block of 3-D text to another. MacroMind Three-D lets you animate between two or more predetermined models—but only if they have the same number of points. Metamorphosis in MacTOPAS involves animating the control points of spline grids and meshes, which can also be quite powerful.

Truly versatile 3-D animation programs let you control a number of objects at the same time. Sculpt 4D and MacroMind Three-D offer the best solutions. Sculpt 4D can animate complex models in sophisticated ways—for instance, animating the vertices that make up a character's mouth in order to create the effect of lip-synching. Sculpt 4D also allows you to bring models in and out of an animation as you need them, thereby using memory efficiently.

MacroMind Three-D, however, offers the most powerful overall animation environment because it gives you easy access to all animation parameters via a MacroMind Director-type score (which lets you plot the movements and timings of objects in an animation). You can easily exert precise control over all parameters of each object at any given point in time, while still having a quick overview of the entire animation. Infini-D also offers a reasonably powerful time line for animation control, although it is not as in-depth as the one in MacroMind Three-D. No 3D program is perfect—each has a long list of strengths and weaknesses. In fact, you'll most likely end up owning two or three of the packages. ■

See *Where to Buy* for contact information.

DAVID POOLE is a consultant, animator, and graphic designer for Zen Over Zero in New York. He has worked as a broadcast TV writer and producer and has been a consultant to ad agencies, video production facilities, and TV broadcasters for Mac graphics and video.

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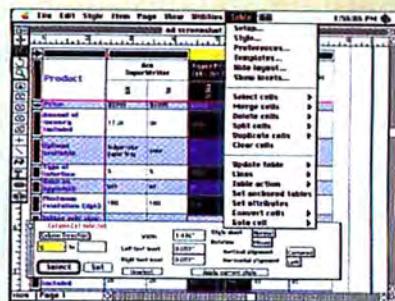
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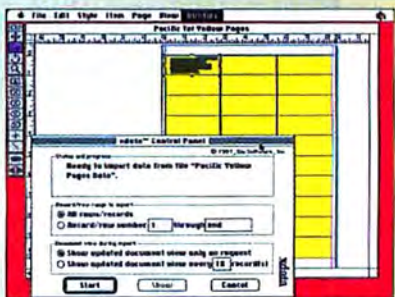
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Reviews

IN THIS ISSUE: OneScanner, Macintosh PowerBook 170, MarketPlace Business, Painter, LaserScript LX, Instant Update, Verbum Interactive, Hard Disk Toolkit, Help, and more

Flatbed Gray-Scale Scanner

OneScanner

PROS: Excellent software makes scanning easier for novices; automatic tone corrections; software automatically scans halftoned images without moirés. **CONS:** Slow scanning speed. **COMPANY:** Apple Computer (408/996-1010).

REQUIRES: Hard drive; 1MB of RAM with System 6.0.7, 2MB of RAM with System 7. Recommended: Additional RAM. **LIST PRICE:** \$1299; Ofoto software available separately for Apple Scanner owners from Light-Source (800/231-7226). \$195.



ANY REVIEW OF APPLE'S NEW OneScanner is bound to quickly become a review of Ofoto, the scanning software that's bundled with the device. That's because the scanner itself is a run-of-the-mill 8-bit, 300-dots-per-inch flatbed, while the software is unique.

Apple hopes Ofoto will do for scanning what automatic cameras did for 35mm photography: take it out of the hands of professionals and make it part of everyday life. The program's easy-to-use controls might do just that. Ofoto is a real boon for anyone who wants to scan images without working too much, and who then outputs scans on laser printers and other low-resolution devices. The software has automated functions that enable novices to get good results, as well as some unique features that even old scanning hands will appreciate.

Canny Scanning

OFOTO WORKS IN A COMPLETELY DIFFERENT way from other Mac scanning programs. To use it, you don't have to know anything about bit depth, how to

adjust tonal values, or how to solve that perpetual scanning conundrum—what resolution to set for a given halftone line screen, output device, and scaling factor. Instead, you simply pick an output device from a menu and let the program handle the rest, with Ofoto plugging in optimal resolution values as well as a predefined tone-correction curve. During prescan, Ofoto senses whether the artwork being scanned is line art or a photograph, and sets bit depth accordingly. Naturally, you can switch to manual control and set up your own scan parameters.

You can also add new printers to the output-device list and adapt the printer characterizations Ofoto supplies to calibrate for your own particular printer. The calibration process is straightforward. You print a software-generated gray chart, scan the printout, make any changes you want to the resolution and bit-depth settings, and then name the resulting calibration file.

Ofoto includes a number of other features that make scanning easier, such as a magnifier that lets you zoom in on prescans to select the exact image area

you want. Ofoto has an excellent tool for free and numerical rotation. It can sharpen, resize, flip, and crop scans after you've made them. The program can save a compressed TIFF file or print a random dither pattern that maximizes image quality on low-resolution printers. And it has a superb scaling tool that works in tandem with the program's mechanism for setting scan resolution. You simply enter the height, the width, or the scaling factor you want—or any combination of the three—and the program calculates the scan resolution required to deliver the best results.

Anyone who has watched a demonstration of Ofoto will likely have seen the program presented in terms of one-touch, fully automated scanning. Some of the features that make this possible are the software's ability to automatically find the edges of a page, crop to them, and rotate the page to straighten it if necessary. While these features are clever, they are not actually that useful considering the delay they entail. Autocropping is unreliable, and even when it works it doesn't do what you really want it to, which is to crop

to the edge of the image, not the edge of the page. As for autorotation, putting the artwork on the scanner straight to begin with is quicker. Mercifully, Ofoto allows you to turn off these functions.

Means behind the Scenes

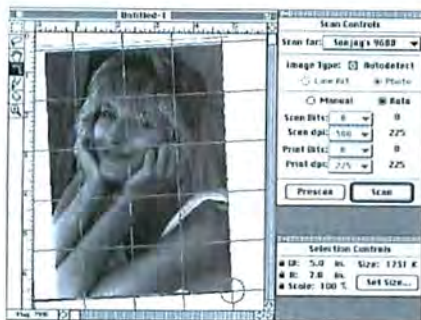
TWO OF OFOTO'S MOST IMPORTANT facilities are its high-quality *interpolation algorithms* (selected as Faster and Better Quality), which work behind the scenes to accomplish many of the program's operations. These routines come into play whenever Ofoto has to take an image apart and reconstitute it at a different size, resolution, or orientation. They're what enable the program to rotate images, for example, or to simulate scans that have a higher resolution than the scanner's maximum sampling rate (this works particularly well with line art, which comes out looking very smooth).

One of the most unusual things about Ofoto is that it uses high-quality interpolation on virtually every scan it makes. No matter what your desired scan resolution, Ofoto always scans using the OneScanner's maximum resolution of 300 dpi. The software then processes the data to either fabricate a higher resolution or, more typically, sift the scan down to a reasonable size. This approach has its pros and cons.

The biggest plus is that interpolation automatically prevents moirés caused by scanning previously halftoned material.



Tone Correction Laser-printouts before (top) and after (bottom) calibrating for the printer.



Finessing the Interface Ofoto's rotation tool throws a grid to help you align an image to 90 degrees. At right, the scan controls are set to the defaults for an Agfa 9600 imagesetter. The selection controls at the bottom ensure that the final selection will be 5 by 7 inches, with no enlargement.

Filtering down from a higher resolution also produces better quality than the method most scanners use, which simply throws away unneeded samples. The process averages out scanner noise, which can cause a speckled, uneven appearance in what should be flat areas of a picture. It also yields somewhat smoother edges and better detail.

The disadvantage is that Ofoto's processing makes the OneScanner much slower than most gray-scale units—about six times slower in Better Quality mode at high resolutions. Of course, raw scanning speed isn't everything. If you look at the time it takes to set up a scan and tone-correct it to your liking, Ofoto is undoubtedly more efficient in many situations than much faster devices. But it's too bad the software makers didn't provide a quicker, even if inferior, scanning method.

A Good Choice (For Now)

OF COURSE, THE ONESCANNER CAN'T replace skill when it comes to making top-quality halftones. One reason for this is that all images are different, and tonal corrections based on the output device rather than on the image being scanned can only do so much. In my tests, Ofoto's autocorrected scans tend to match the original closely in the midtones, but lack punch because they contain no true blacks or whites. Experienced users will be disappointed to find that the program offers no facilities for selecting the highlight or shadow points of an image, or for adjusting the tone-correction (gamma) curve directly. Anyone who wants optimal results and creative control will still need a program like Photoshop or Enhance.

That's not to say that automatic tone correction isn't useful. It might not provide perfect results for artists or for publishers who want to produce final, imageset film at high resolutions. But for most laser-printed applications—real es-

tate listings, position stats, parts catalogs—Ofoto's autocorrections are good enough and can save you from the time-consuming task of manual correction.

It would be nice if Apple would someday release a device that pushes scanning technology to a higher level, instead of just to a broader audience. By present standards, however, the OneScanner and Ofoto make a solid package. The hardware provides quality as good as or better than that offered by the competition; the software adds considerable value, especially for novice users; and Apple's pricing is aggressive. The OneScanner also comes with HyperScan 2.0, a big plus for HyperCard users. Prospective buyers might want to consider that, for an additional \$300 to \$400, they can get a decent color scanner—with a copy of Photoshop thrown in. But if you decide to go with a gray-scale scanner, the OneScanner is the one.

—JOE MATAZZONI

Laser Printer

LaserScript LX

PROS: Automatic emulation switching; good-quality resident fonts; easy assembly; helpful LCD displays; good performance for the price. **CONS:** Slow; heavy; graceless downloaded fonts; expensive supply-replacement costs. **COMPANY:** Abaton (510/683-2226). **LIST PRICE:** \$1995.

ABATON'S LASERSCRIPT LX IS the new version of the original LaserScript, which received a middling reception due to its slow speed and limited capabilities (see "Personal Page Printers Arrive," *Macworld*, May 1991). The LX is a significantly better printer. Using a National Semiconductor processor running at 25MHz, instead of only 15MHz in the old model, the 300-dots-per-inch, 6-pages-per-minute LaserScript LX is much faster.

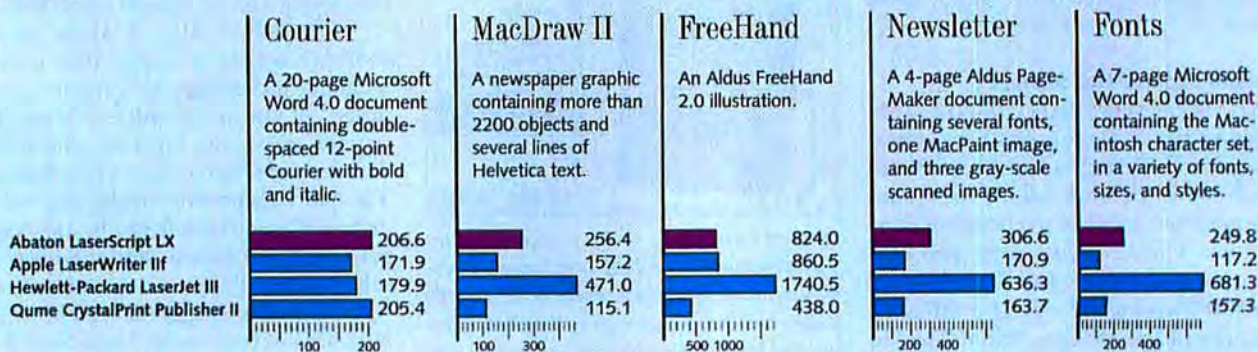
Not only is the LX's performance better than the old LaserScript's, but its performance would have placed the LX with the top of the pack reviewed in *Macworld's* May feature. Compared with the high-end printers evaluated in the December 1991 feature "High-Performance Printing," the LX is slower in the same tests than most of the field. It did edge out the Brother HL-8PS (listed at \$4495), and was clearly faster than the Hewlett-Packard LaserJet III (\$3395). Two high-performance printers are faster than the LX: the Epson EPL-7500 is 80 percent faster; and the Qume CrystalPrint Express is 67 percent faster.

continues



How Fast Is the LaserScript LX?

Times are in seconds.



Despite Abaton's claims that the LaserScript LX outperforms the LaserWriter IINTX, in comparison tests, the LaserWriter IIg (the IINTX's successor) was considerably faster and had better-quality print and graphics. The Abaton, using the Microsoft Bauer PostScript interpreter, produced heavier and less graceful versions of the typefaces tested (Optima, New Baskerville, and Nofret). The LX's typefaces will satisfy most users, but not type connoisseurs.

The LaserScript LX has four active printer ports with automatic switching, and it supports both the Macintosh and PCs on the same network.

When you turn on the printer, the LCD window on the front panel of the printer displays the tests the LX is running before it's ready. When the printer is ready, four fields tell you the current emulation: the size and weight of the paper setting; whether the printer is online, offline, or malfunctioning; and which port is active during transmission. The LCD window also guides you through diagnostic tests.

The LaserScript LX weighs 35.3 pounds and is 16.1 inches wide, 8.3 inches high, and 15.4 inches long (the detachable loading tray adds 8 inches to its length). It has 2.5MB of memory that can be expanded to 4.5MB with optional font cartridge support.

The LaserScript LX is easily assembled. The separate toner cartridge and drum slip easily into a tray that slides into the printer. You will need to buy AppleTalk cables, which do not come with the printer.

The LX's toner cartridge needs to be replaced after 1500 pages of printing, although the toner cartridge that comes with the printer lasts for only 750 pages. The drum unit should last for 10,000 pages. Replacement costs average about 4 cents per page.

The printer's warranty is for one

year on all parts, 60 days on labor (parts replacement), and 90 days for on-site service (maintenance). The technical support at Abaton is a toll-free call to polite, helpful people.

The LaserScript LX is reasonably fast, easy to use, and inexpensive. For less than \$2000, you get good 300-dpi print quality and automatic switching between Macs and PCs. Still, Apple's new LaserWriters IIg (\$3999) and IIg (\$4999), as well as printers from QMS and other manufacturers, have new image-enhancement technology that smooths lines and sharpens type, and are faster. But if you don't print a lot of graphics or need all that speed, spend the money you save on a vacation.—STEVEN HANKS

Notebook Computer

Macintosh PowerBook 170

PROS: Macintosh IIci equivalent; highly readable display; good battery management. **CONS:** Awkward keyboard and trackball; difficult to add hardware upgrades. **COMPANY:** Apple Computer (408/996-1010). **LIST PRICE:** With 4MB of RAM and 40MB hard drive \$4599.

MACINTOSH USERS HAVE been longing for their version of portable computing. The Macintosh Portable by no stretch of the imagination fulfilled this desire; if anything, it tweaked the noses of those seeking portable Mac computing. Apple's new PowerBooks redress that grievance.

The Macintosh PowerBook 170 is the top of the PowerBook line, thanks to a 25MHz CPU, a math coprocessor, a built-in modem, and 4MB of RAM. As a computer, it is equivalent to a Mac IIci.

But how good a *notebook* is it? It's a powerful computer in an attractive pack-

age, but does it really work as a portable? The answer is yes, although it could be better. While the PowerBooks are a giant step forward for Apple, in the greater notebook universe the 170 is merely a solid but typical machine. The PowerBooks do not represent the kind of pioneering technology and vision that the original Macintosh did. DOS notebook users can easily show you the same kinds of features—low weight, good screen display, high processor power, and fast hard drives—on machines available to them for years. And DOS notebooks avoid some of the flaws of the PowerBook: small keys, awkwardly placed trackball, and barriers to adding hardware options.

Taking It with You

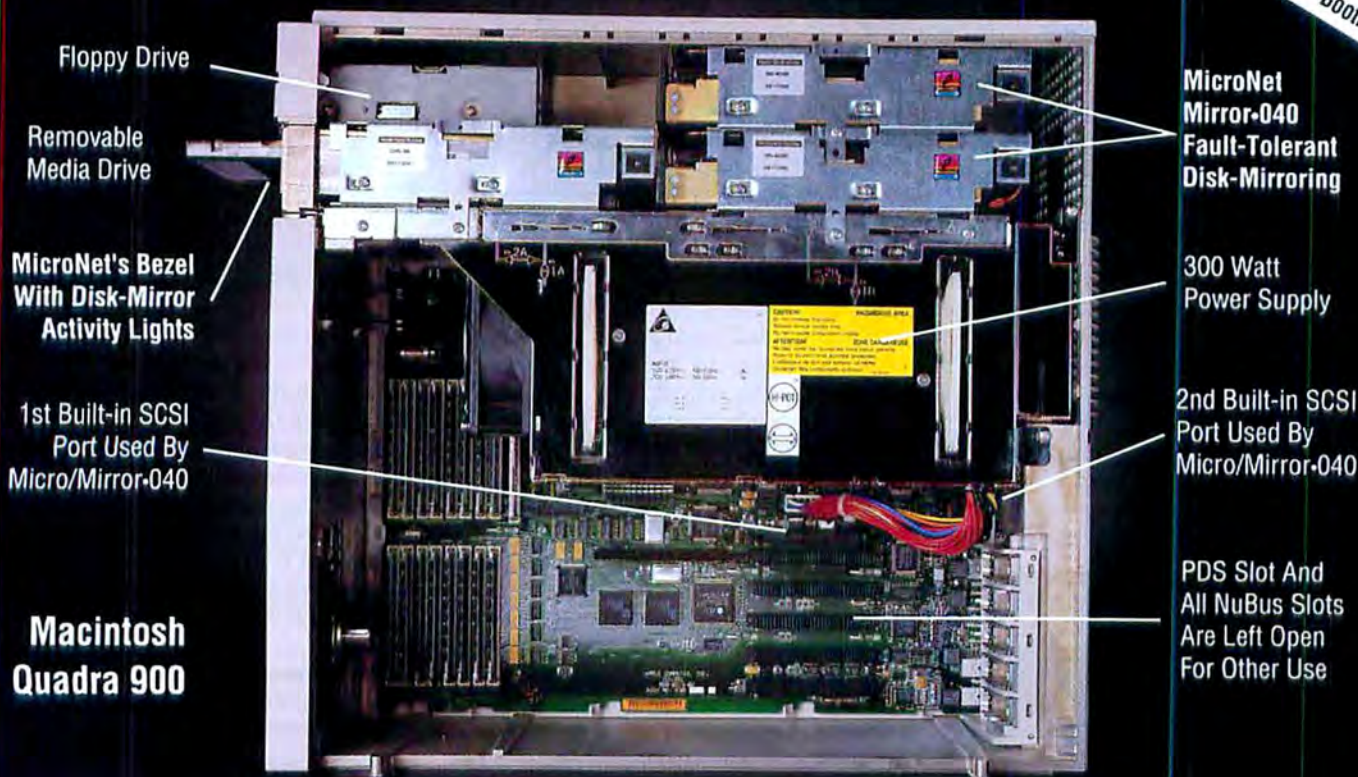
REGARDLESS OF THE MACHINES' flaws, Macintosh users will buy PowerBooks, since the advantage of having a real Mac portable outweighs any inconveniences. To see what it is like to use the 170 as a portable, I used it on my couch, on my dinner table, and at my home office's desk. I also used it on the local subway system and in someone else's cubicle at the office. In short, I tried it out as a employee working sometimes at home, while commuting, and while at someone else's office.

At home, the 170 did best on my desk, since the keyboard height was close to where I prefer it. My dinner table is higher, which meant I had to hold my arms higher than I like to get over the palm rest at the front of the PowerBook. While any keyboard on that table would be higher, the palm rest adds a noticeable barrier that other notebook designs don't, including the Mac-compatible Outbound Notebook System 2030. Fortunately, I could use the leg lifts at the back of the PowerBook to change the keyboard's angle. Obviously, different

continues

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Circle 113 on reader service card

people are built differently, so what is uncomfortable for one person is comfortable for another. But the PowerBook's keyboard and palm-rest design makes it hard to adjust the comfort level.

Wherever I used the 170, I found that its recessed keyboard meant that I pulled the notebook closer so I could comfortably reach the keys. But that meant the screen was uncomfortably close: 14 inches rather than my usual 18 inches with a DOS notebook, where the keyboard comes right to the edge of the case. The 170's beautiful screen, based on active matrix LCD technology, is readable from very near and from far away, from a wide range of angles, and in all sorts of lighting conditions. (Incidentally, I checked the emissions of extremely-low-frequency radiation to see if this closer screen distance should concern me. The answer is that it should

awkward. The keys are slightly closer together than normal, and I found the difference enough to result in mistyping. The keys are also less tactile than I prefer: often I thought I had typed a character but had not pressed down enough for the PowerBook to notice, resulting in many misspellings. A spelling checker has extra value on a notebook.

When sitting on my couch, I found the PowerBook to be back-heavy, which brings the front up, pushing against my wrists. (This might be an advantage of the palm rest: it keeps the PowerBook from tilting backward in that position.) Putting the leg lifts up helped counterbalance the PowerBook.

It was while commuting that I had the most trouble with the trackball. Trying to position the cursor to select text on a rocking train was a challenge better suited for video-game enthusiasts. However, no pointing device works well in an unsteady environment.

A word of advice to commuters and airplane riders: although at 6.8 pounds the PowerBook 170 is light for a computer, carrying it from the office two blocks to my car in the crook of my arm was tiring. If you don't carry a briefcase or wear a backpack, get a carrying case when you buy a PowerBook. Several companies sell carrying cases, and they're definitely worthwhile.

As a visitor using someone else's office, I quickly added a full-size keyboard and a mouse. This let me position the display and keyboard independently, as well as type on a familiar keyboard with an easier-to-use layout. (The arrow keys on the PowerBooks are placed in a row at the bottom right, so I had to look each time to see which one I was pressing. I found this difficult because I'm used to the design of an extended keyboard, where the up arrow is on top and the right and left arrow are to the right and left. I'm also a firm believer in Page Down and Page Up, which are lacking in the PowerBooks.)

The PowerBook's battery management is good, warning you of impending power outage several times and extending battery life automatically by dimming the display, which consumes a lot of power. A test developed by Macworld Lab showed that the 170's battery lasts 1 hour and 46 minutes in disk-intensive operations like frequent saves. That's about enough battery life for a commute. If you plan to travel cross-country or overseas, bring an extra battery.

Compared with many notebooks, the battery charges quickly (in about three hours, or in about four or five if you're using the notebook while it's charging—

a great feature lacking in many DOS notebooks). Two batteries should do the trick for most people.

The 170 feels solid. The casing is strong, with little give when I pushed (OK, pounded) on it. Compared with the flimsier plastic on the PowerBook 100 and many DOS notebooks, the polycarbonate casing on the 170 (and 140) is a plus. The hinge that connects the display to the notebook is solid and offers a good grip once you've positioned the display's angle to your liking. I also tend to pick up the open notebook by the display rather than by the base, but it has never become loose or felt precarious.

As a test of the internal components' durability, I put the 170—turned on with an application running that did frequent hard drive access—in my backpack and then hopped on my bicycle for the five-mile ride to the office. About a half hour of shaking did the 170 no harm, and the machine was still chugging away when I got to my desk.

Odds and Ends

AS WITH ALL THE NEW APPLES, THE PowerBooks come with the new System 7.0.1. This update to System 7 takes less room in memory (1MB versus the 2.2MB for System 7.0 on my Mac II), which is great, since 4MB of RAM is standard on the 170. Virtual memory gives you more memory by allocating part of the hard drive as if it were RAM. While virtual memory is slower than real memory, it comes in handy if, for example, you occasionally use a program whose memory requirements exceed the Mac's. This is particularly helpful for the PowerBooks, which require dealer installation of memory upgrades.

Unfortunately, Apple chose not to include a video-out port to connect the PowerBooks to color monitors and overhead projectors—again, standard in DOS notebooks. This omission requires the use of a bulky adapter or installation (yes, by a dealer) of an internal board that plugs into the RAM slots. Several companies have figured out how to get around Apple's omission through clever engineering involving the SCSI or RAM ports, but such tricks shouldn't have been necessary.

Apple says it designed its notebooks under an accelerated development schedule, which may account for these basic design omissions. However, Outbound Systems managed to deliver a Mac notebook that allowed for easy upgrades almost three months before Apple did, although the Outbound notebooks also lack video-out ports.

continues



Macintosh PowerBook 170

not, since at even only a few inches away, the LCD display's emissions were not measurable against the background radiation in my cubicle.)

Although it is touted as an ergonomic feature, I suspect that the palm rest's real purpose is to make room for the trackball. I don't like the trackball. Part of that dislike is simply that I don't like trackballs of any sort. The other part is that its position below the keyboard means I have to move my hand down, and thus my body back to keep my arm in a comfortable position. The constant moving back and forth, coupled with the jittery feel of manipulating by trackball, soon drove me to a workaround: I plugged a mouse into the ADB port (the trackball still functions when you plug in a mouse). For places where a mouse just won't work, like on a train or plane, I wish there were a clip-on trackball available à la Microsoft's and Logitech's offerings for DOS notebooks.

The 170's keyboard (which is the same as for the other PowerBooks) is also

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A Good Machine, Really

IT MIGHT SOUND AS IF I DON'T LIKE the PowerBook 170. Not true. It's a quantum leap for Apple, and a credible notebook in its own right. None of its flaws are fatal. I would eagerly use a 170 on the road. And I wouldn't mind using its CPU as my primary computer, as long as I had a full-size keyboard, mouse, and external hard drive (40MB is not enough in my work) on my desk to plug into the 170 when working at the office.

The PowerBook is no Mac Portable—Apple avoided a repeat of that debacle. With a bit more attention to adjustable ergonomics features and upgradability, Apple could have a leading-edge notebook rather than “just” a competent performer.—GALEN GRUMAN

Direct-Marketing Database

MarketPlace Business 1.1

PROS: Well designed; easy to use; excellent online help. **CONS:** Relatively complex installation; requires lots of RAM; slow; significant price increase.

COMPANY: MarketPlace Information Corporation (617/225-7855).

REQUIRES: Mac Plus; 4MB of RAM; hard drive; CD ROM drive.

LIST PRICE: With 3000 meter credits \$695; each 5000 additional meter credits \$500; first year's quarterly update discs \$195; annual renewals \$495.

IN THE FALL OF 1990, LOTUS Development Corporation introduced Lotus MarketPlace: Business—a direct-marketing tool containing a comprehensive list of businesses nationwide—and trumpeted a soon-to-be-released companion product, Lotus MarketPlace: Households, which was to make available the names, addresses, and socioeconomic status of millions of people. The still-unfinished Households edition sparked a furious debate over privacy; tens of thousands asked that their names be removed from the Households database.

Surprised and stung by negative publicity and the vehemence of public reaction (see *The Iconoclast*, June 1991), Lotus canceled Lotus MarketPlace: Households and withdrew Lotus MarketPlace: Business (LMP) in early 1991. A few months later, members of the original Lotus MarketPlace development team formed a new company, acquired the rights to LMP, and renamed it MarketPlace Business (MPB). The subsequently rereleased product is an upgraded version that is in most ways identical to the Lotus original.

Data on a Disc

MPB IS COMPOSED OF A CD ROM DATA disc and a HyperCard stack. The disc—sent by courier after you purchase MarketPlace, so that you receive the most-current data—stores information on approximately 7 million businesses, and the stack makes sense of it all. The data on the disc is from Dun's Marketing Services, a division of Dun & Bradstreet Information Services. (This is a major change from LMP, which obtained its data from Trinet.) Each record in the database contains the name, address, telephone number, SIC (Standard Industrial Classification) code, principal officer, annual revenue, number of employees, and other information about a business. Dun's Marketing Services constantly updates its database, and MPB incorporates these changes in quarterly update discs, which are available by subscription.

To use MarketPlace, you must first run its Business Setup program to install the meter that keeps track of list purchases; Business Setup also installs a copy of HyperCard if you do not have one. Installation involves entering several lengthy code numbers, one of which you must get by phone from the company. Fortunately, but for its failure to address System 7, the Getting Started manual is quite clear about the procedure.

Unfortunately, because you can install only one meter, you can only run MarketPlace from one hard drive at a time. And moving the program from one computer to another is not to be undertaken lightly: the procedure requires deinstallation, reinstallation, copying the data and entering another lengthy code number, and another phone call.

Defining Your Audience

MARKETPLACE'S MAIN SCREEN IS EXCEPTIONALLY well designed; it describes the three major steps in purchasing a list and provides access to each of the program's essential functions. The first step in the process, defining the parameters of the list, is represented by six icons. Each icon leads to a separate screen or set of screens in which you can specify the types of businesses that interest you. The Annual Sales and Number of Employees icons open charts of businesses' revenue and employees subdivided by magnitude; the Location and Area Code icons lead to dozens of state and regional maps in which you can specify the desired geographic area; and the Type of Business icon opens a nested series of screens containing lists of SIC codes and their definitions. A sixth icon enables you to specify only those records whose infor-

mation has changed since the previous update (so you can easily update a list) or exclude records.

If you can't find the SIC code or location you're looking for, or want to call up a specific record, special Find commands are available in the appropriate screen. At any point in the list-definition process, you can call up a summary of the current list definition or obtain an estimate of the number of businesses that it encompasses. If the estimate indicates more names than you want, you can refine the definition, or MarketPlace can generate a random sample—either a percentage of the total or a specific number of names. (MarketPlace can also save the remainder, should you decide to purchase it later.)

Whether you've purchased a list or not, you can preview and/or analyze it, to make sure that it meets your needs, for example, or to help you make strategic business decisions. A preview or analysis of an unpurchased list displays only basic information (business name, city, state, zip code, SIC code).

Getting and Spending

WHEN YOU DECIDE TO BUY A LIST, MarketPlace records the data (another often time-consuming process) and deducts the appropriate number of units from your purchase meter. Compared with LMP's price structure, the cost of a list is now significantly higher. To offset the price increase, you can now purchase part of a record; just mailing information for 1 credit per record, for example, or only telemarketing data for 2 credits per record.

Once a list has been purchased, MarketPlace can sort and print mailing labels in dozens of standard and Avery label formats. It can also print the list in four standard telemarketing and contact report formats, or in a custom report you design. If you want to use the data elsewhere—in a mailing program such as MacEnvelope, for example—MarketPlace can export the list as a tab-delimited text file as well.

Don't Call Your (List) Broker

MARKETPLACE BUSINESS REQUIRES 5MB of hard drive space and has an enormous appetite for RAM. Despite that, and the few previously mentioned imperfections and its higher per-record price, however, MarketPlace is genuinely impressive. Few major applications are as easy to use or as well explained, in print and on screen, as this one. Compared to most productivity programs, MarketPlace's cost-effectiveness is obvious and immediate.—ROBERT C. ECKHARDT

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Graphics Cataloging Programs

Mariah 1.06

PROS: Catalogs sound files, animation files, text-only files, and resources; plays sound and animation files; has slide-show feature; strong exporting and file-conversion capabilities; easy to use. **CONS:** Inefficient use of hard drive space; limited search capabilities. **COMPANY:** Symmetry Software (602/998-9106). **REQUIRES:** Mac Plus; System 6.0.4; hard drive. **LIST PRICE:** \$149.

Multi-Ad Search 1.0

PROS: Efficient use of hard drive space; supports up to 128 simultaneous users; powerful search capabilities; extensive online help. **CONS:** No file-conversion facilities; inadequate handling of lost files. **COMPANY:** Multi-Ad Services (309/692-1530). **REQUIRES:** Mac Plus; 2MB of RAM. **LIST PRICE:** \$199.

PictureBook+ 1.0

PROS: Supports multiple open books; flexible image sorting; can lock books to prevent changes; contains a graphics and text editor; can specify an application type when exporting; can export resources; special printing formats. **CONS:** Inefficient use of hard drive space; limited search capabilities. **COMPANY:** Loop Software (415/326-4803). **REQUIRES:** Mac Plus; hard drive. **LIST PRICE:** \$129.95.

THE MORE YOU GET INTO desktop publishing, the greater your reliance on graphic images grows. You end up with hundreds, even thousands of clip art images, PICT drawings, and high-resolution TIFF and EPS graphics. Then when you're asked to design, say, a sales flier for a line of office supplies, you have to remember where you put that nice drawing of a paper clip. If you have Mariah, Multi-Ad Search, or PictureBook+, your problems are over.

Each enables you to create collections, or catalogs, of graphics files. You can assign keywords to images to categorize and locate them easily; view pictures as thumbnails or at full size; and once you find the one you want, you can copy and paste it into another application, such as a desktop publishing program.

Mariah

MARIAH CAN STORE AND ORGANIZE sounds, text-only files, and animation sequences; and you can play sounds and animations from within the program. If

you have a Mac LC or IIsi, or are running System 6.0.7 and have a MacroMind/Paracomp MacRecorder, you can record sounds directly into collection pages. Mariah can also convert files among several major graphics formats via its Export command. Marquee and lasso tools let you select all or part of a graphic and paste it to the Clipboard.

Searching by keyword in Mariah can be confusing at first because there are two search commands: filtering and gathering. Filtering lets you search by file type (one type or all) and keyword matches. You can also perform multiple searches, and Mariah will find just files that satisfy all search criteria (an AND search). Filtering works only with an open collection.

Mariah supports Boolean AND and OR criteria and lets you search several collections for up to three keywords. All searches are by keyword or by a single file type (such as PICT). If you want to find files created during a particular week, for example, you're out of luck.

Mariah's only significant problem is its profligate use of hard drive space. Rather than storing pointers to files, a Mariah collection contains a full copy of each file. A collection takes as much space to store as do the originals. I recommend using Mariah to organize art into collections and then deleting or archiving the original files. When you want to work with one of the images, use Mariah to export or copy it from the collection.

Multi-Ad Search

MULTI-AD SEARCH WAS DESIGNED with network users in mind. An administrator creates and maintains catalogs; users add images, keywords, and descriptions at the administrator's discretion.

Unlike with Mariah and PictureBook+, you can't view a Multi-Ad Search catalog immediately after opening it. You must first issue a search command (all files, file names containing the word *tree*, and so on). The images can be displayed as thumbnails or listed as text. Both views show the file name, graphics type, and drive location. Text-list mode also displays the file description, keywords, and any manufacturer-imposed expiration date for each graphic. You can get full-size images in either mode.

To copy Multi-Ad Search images to other programs, you can copy images to the Clipboard or use Multi-Ad Search's proprietary Clipboard format, FTCH. Rather than hold a copy of the image in RAM, FTCH points to the image's location on disk. At present, Multi-Ad Creator and QuarkXPress support FTCH.

Because files within a catalog can be scattered across multiple volumes, the

program provides a way to search for "lost" files—that is, files that have been moved or located on unmounted volumes or on volumes that have been deleted. If it cannot find a file, Multi-Ad Search presents a standard dialog box asking if you want to search for the file. When you close the found file, Multi-Ad Search loses sight of the file again. To permanently record the location, you need to run a separate Update procedure.

The only significant weakness of the program is its inability to convert files and to export partial images. Multi-Ad Search is ideal for the tasks for which it was designed—organizing and cataloging masses of images while using as little hard drive space as possible.

PictureBook+

PICTUREBOOK+ COMES IN TWO versions with identical features: a program and a desk accessory. The only difference is in the menu arrangement. Collections are called *books*, and images can be entered in three ways. First, by a simple copy and paste. Second, the Read Data command can add all or specific files within a folder. Finally, the program includes a Chooser document called LoopWriter that saves a document printed from any application as a PICT clipping in the book of your choice.

Once added to a book, files can be sorted by name, date, size, or file type. You can rearrange them by dragging the file name or its thumbnail to a new position in the list. There is a comment box for each graphic, where you can add a description, keywords, details of how the graphic was created, and any notes you like. Beware of using the standard *Edit* commands while writing comments, though. Instead of copying or cutting the notes you're working on, those commands copy or cut the picture.

PictureBook+'s editing tools are the most versatile of those offered by the three programs and include tools for cropping, resizing, and selecting portions of a graphic. You can also edit text images—cut and paste; change fonts and sizes; add, delete, or change text.

PictureBook+ does have its shortcomings. Like Mariah, PictureBook+ is cavalier in its use of hard drive space, with each book occupying approximately the same amount of space as the images it contains. Second, its search capabilities are weaker than those of the other programs. You can only search for a single text string within the images' comment boxes. But PictureBook+ excels in exporting graphics and in price.

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Standard 6MB RAM	✓			✓	✓
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MacUser Magazine, Sept. 1991



Book 'Em

WHEN SELECTING A GRAPHICS ORGANIZER, there are a few issues to consider. First, be sure your system has sufficient RAM. If your catalogs will be large or hold memory-hogs such as TIFF files, consider 4MB to 8MB of RAM. Second, if you have many images to catalog, you'll need to invest a lot of time assigning descriptions and/or keywords to each file. Finally, as good as they are, all three programs share a weakness: they lack a simple way to deal with several images at a time. That's no problem if you've only got a few images. But imagine having a CD containing 375 Yuletide images all with the keyword *Christmas*.

If you have hundreds of images to catalog, particularly if the images are stored on a network, Multi-Ad Search is the obvious choice. It handles the task with ease while keeping RAM requirements to a minimum. If you deal with smaller groups of images but find exporting capabilities a prime requisite, either *Mariah* or *PictureBook+* will do the job. The main difference between the two is that *Mariah* catalogs sound and animation files and runs slide shows, while *PictureBook+* provides sophisticated editing capabilities.—STEVEN A. SCHWARTZ

Color Paint Program

Fractal Design
Painter 1.0

PROS: Inexpensive; easy to use; pressure-sensitive tools correspond to real-world models; 22 paper textures; compatible with Photoshop filters; built-in virtual memory. **CONS:** No type tool; no scaling or rotation; insufficient frisket control.

COMPANY: Fractal Design Corporation (408/688-8800). **REQUIRES:** Mac II; 2.5MB of RAM; hard drive; 8-bit monitor; 32-bit QuickDraw; System 6.0.5. Recommended: 4MB of RAM; color monitor; 24-bit color board; Wacom pressure-sensitive tablet. **LIST PRICE:** \$299.

Painter is an artist's program, pure and simple. Its structure and interface are so straightforward that any artist should be able to use the program in a matter of minutes. If you dig deeper into the program, you'll discover capabilities far beyond anything in *PixelPaint Pro*, *Studio/32*, or *Oasis*. And Painter's remarkable list price makes it the best painting bargain around.

But there are a few features you might miss. Painter is the only paint program that lacks a text tool. It is also missing any

transformation feature, be it scaling, rotation, slanting, reflection, or perspective.

The Painter's Workshop

THE PROGRAM OFFERS A PALETTE OF 52 tools. To make the tools more manageable, they are grouped by category: the pencils include a 2B pencil, a 500-pound pencil, and a color pencil; the brushes include horsehair, watercolor, and Japanese brushes, as well as a brush that paints in the styles of Seurat and van Gogh; the pens include a fine-point marker and a felt-tip; and so on.

Each tool works like its real-world counterpart. The chalk draws a thick gritty line that covers existing images; the feather-tipped airbrush draws a thin line with soft edges that gradually darkens as you paint. You can edit the performance of any tool and design new tools using three modifiers: Brush Size, Brush Behavior, and Expression. Brush Size determines the diameter of the tool's tip, whether the tip is elliptical or round, and the shape of the tip when viewed from the side. For example, if the tip tapers dramatically to a sharp point, the tool paints like a sharpened pencil.

Using the Brush Behavior modifier, you might specify that, say, a single pencil stroke draw a jittery pattern of dots (similar to the way the Seurat tool creates a pattern of paint droplets) or you might have the pencil draw several lines at a time (the way the Van Gogh tool creates multiple brushstrokes). You can also specify the amount of color a tool picks up and smudges when you draw across existing colors, which simulates drawing with a felt-tip marker.

The third modifier, Expression, determines the performance of four variables—Size, Jitter, Opacity, and Color—over the course of a line. Each variable can fluctuate according to the speed, direction, or pressure of a stroke. For example, you can link size to speed to make a slow stroke create a thick line and a fast stroke create a thin line. You can link opacity to direction, making a vertical stroke transparent and a horizontal stroke opaque. Painter allows you to get variable lines using just a mouse.

Changes made to a tool remain in effect as long as you use that tool. To save changes, create a new tool (called a variation), which is stored permanently in a settings file. The tool can then be used in any existing or new painting.

Painter allows you to add surface texture to a painting after the fact. After selecting from 22 paper surfaces, you specify the relative location of the light source, the amount of light projected, and the shine of the paper. Deactivate



Applying Texture This portrait was drawn from scratch using Painter and a pressure-sensitive tablet. A rough paper surface was applied and lit from 11 o'clock. (Dialog box has been repositioned.)

the shine to create shadows in light colors; activate the shine to create highlights in dark colors. Once the surface texture has been applied, the painting as a whole appears more realistic.

Although Painter provides no image-editing filters, it supports any Adobe Photoshop-compatible external filter. This excludes Photoshop's built-in filters, such as blur and sharpen, but includes most of the special-effects filters as well as third-party filters such as those included in Aldus Gallery Effects.

Fractured Friskets

THE ONLY REAL PROBLEM I HAVE with Painter has to do with its frisket capability. (Generally known as a mask in other paint programs, a frisket is a stencil that limits the area in which you paint.) You can draw a freehand frisket inside Painter or load a precreated frisket. Ironically, while all the pre-created friskets provided with Painter are geometric ones—ellipses, rectangles, stars—Painter provides no means to draw a geometric frisket. The manual recommends that you use *ColorStudio* (the image-editing program created by the same programmers who developed Painter) to create more-complex geometric friskets.

Two additional tools let you move and rotate friskets. Unfortunately, there is no way to resize a frisket, and if you want to change its shape, you have to redraw the frisket from scratch. The final blow: in Painter friskets always have hard edges, and there isn't any way to create antialiased friskets.

Fix the frisket oversights and add a text tool, and Painter would be the most perfect paint program I can imagine. Just when I was about to write off high-end paint software, Painter gives me hope for the electronic palette.—DEKE MCCLELLAND

Hard Drive Utility Package

Hard Disk Toolkit 1.0

PROS: Comprehensive; universal disk-drive formatting; terrific benchmarking capability. **CONS:** May be risky in inexperienced hands. **COMPANY:** FWB (415/474-8055). **REQUIRES:** Mac Plus; System 6.0.2. **LIST PRICE:** \$199.95.

FWB, MAKER OF THE POCKET-Hammer50 and PocketHammer100 now brings you Hard Disk Toolkit (HDT), a suite of utilities that takes a holistic approach to hard drive health. HDT's seven modules do everything from optimizing a hard drive to testing and evaluating it for possible trouble down the road.

Two modules are geared primarily for periodic hard drive tune-ups. The first, HDT Primer, is an excellent formatting and testing utility. It scans the SCSI bus and displays any mounted SCSI devices. You then have the option of formatting, partitioning, updating, or verifying (testing) any of these drives. You can even change their desktop icons.

What distinguishes HDT Primer from similar utilities is that it enables you to universally configure different mechanisms—removables, opticals, flopticals, and hard drives from various vendors—sidestepping

problems that can occur when you're using drivers formatted with different software. HDT Primer's testing facility examines devices for bad sectors and if requested, maps them on screen.

HDT's other customizing module, World Control, lets you configure almost every aspect (150 parameters) of hard drive operation—far more control than most people need. This tool is for the most proficient technician only. Heed the manual's warnings—for example, "The page parameter customizing function of World Control is a very powerful tool, affecting the low-level operations of a hard drive. As a general rule, the page parameters are already set for optimal performance by HDT Primer." This brings me to my one complaint about HDT's manual. It explains each parameter and its function but not why you would want access to these intricate controls.

HDT BenchTest provides six comparison tests for measuring hard drive performance, each of which can be set for three levels of accuracy. You can compare several drives to one another or track one drive over time. You can also select parameters for testing. HDT BenchTest can also index drive performance data according to real-life uses to show how fast a drive would complete file processes. But know that testing takes time; the Maximum Accuracy BenchTest takes close to 10 minutes on a

100MB drive and requires you to skip loading any extensions (INITs) on start-up.

The remainder of HDT's modules help keep a hard drive running efficiently. HDT Extension lets you specify which SCSI addresses the CPU should search for at start-up, which can shorten start-up time. It also permits removable cartridge drives to be mounted empty, which makes cartridges mountable upon insertion. HDT Prober presents a preview of all of your SCSI devices (mounted or not) and gives you detailed information for all of them. You can also mount these devices from within Prober should they become unmounted.

HDT Util lets you adjust the size of the System heap, which is helpful to System 6 users who have lots of INITs. It also lets you protect files by locking them in place on your hard drive so they can't be copied to a floppy, another hard drive, or elsewhere on the native drive. This protection is limited: aliases created under System 7 can open files that have been locked this way, and someone could delete these files by taking them to the Trash and emptying it.

So, should you buy HDT? Evaluate your hardware situation first. Apple's Disk Tools, which comes with the system software, is adequate for most one-drive, one-CPU users. But if you tangle with varied types, sizes, and ages of hard drives, consider HDT.—MATTHEW R. CLARK

System Diagnostics Tool

Help 1.0

PROS: Thorough reports; can run simulations for different system software versions; finds duplicate programs. **CONS:** Does not report details of incompatibilities; knowledge base contains some errors; program quits if it runs out of memory. **COMPANY:** Teknosys (813/620-3494). **REQUIRES:** Mac Plus; hard drive; System 6.0. **LIST PRICE:** \$149; 10-pack \$795.

STRANGE THINGS HAPPEN TO MY Mac. The System crashes, applications quit unexpectedly, and cursors freeze. If you have more than a handful of applications, fonts, DAs, cdevs, and INITs (or extensions), it's likely that you've had similar problems.

For most users, troubleshooting is a matter of guesswork. Teknosys now offers Help, which analyzes a system's hardware, applications, start-up documents, and other files, and then reports the potential problems. Using Help is easy. To check out your entire system and all attached hard drives, just accept the defaults, and Help will begin its analysis. The more complicated the setup, the longer the process takes. My IICI has over 300MB of storage, spread out

over five volumes; analyzing this setup takes about 20 minutes.

Help presents an on-screen report and saves it to disk for future reference. (Note: Help's suggested memory allocation is 850K. That may not be enough for a large system. If Help completes the analysis and quits without displaying or saving the report, try increasing the memory allocation.)

A Help report has two main parts: configuration information, and diagnostics. The first lists all installed applications and gives details about the CPU; the contents of the System Folder; installed fonts, DAs, and drivers; and attached SCSI devices and expansion boards. The diagnostics report derives mainly from a knowledge base of known conflicts and incompatibilities. It shows conflicts among start-up documents; incompatibilities between installed programs and the Mac model, other attached hardware, and system software version in use; environmental factors (you don't need a heap adjuster with System 7, for instance); and damaged files. Help shows the locations of uninstalled INITs and cdevs, and duplicate copies of programs. One interesting feature is a system simulation that helps you gauge the problems you'll have if you upgrade to a new version of system software such as System 7.

Help's knowledge base is extensive but not error-free. Of the 34 incompatibilities

it listed for my System 7 simulation, 3 were incorrect (the recommended versions of the programs were already installed). However, given the size of the knowledge base and the many different sources Teknosys had to consult, some errors are to be expected.

The weakest part of Help is that it doesn't provide details concerning listed incompatibilities. Also, several programs reported to be incompatible with the IICI have been running fine on my machine for two years. Lacking specifics, it's hard to determine whether a program should be thrown away, or if the potential risk is acceptable, or if it's time to spring for an upgrade. Teknosys plans to offer more-detailed incompatibility information in future versions of Help, and to correct problems by providing online fixes.

Like an antivirus program, Help needs frequent updates to remain useful. Teknosys offers a \$75 annual subscription, entitling users to a minimum of four knowledge-base updates and any upgrades to the product itself.

Tackling system problems is not for the faint of heart. Help won't solve the problems for you, but it's unquestionably the best tool for locating them. Its extensive reports and the troubleshooting tips supplied by the manual should point you in the right direction. Help is a program we've long needed.—STEVEN A. SCHWARTZ

Address Book Database

DynoDex 2.0.4

PROS: Easy to use; good data-entry aids; fast. **CONS:** Single-user only; doesn't communicate with pocket electronic organizers. **COMPANY:** Portfolio Systems (408/252-0421). **REQUIRES:** Mac Plus; hard drive; System 6.0.4. **LIST PRICE:** \$125.

DYNODEX HAS BEEN UPGRADED, and the changes have addressed most of the shortcomings of version 1.1 (see *Macworld*, June 1990).

DynoDex 2.0 comes in two parts, an application and a desk accessory. You can enter data into the DA and use it to dial the phone, but to print you need the application. Both the DA and the application share the same easy-to-use entry screen. DynoDex 1.0 had some good data-entry aids; DynoDex 2.0 is better. One excellent new feature is Shorthand Keys, which lets you assign frequently used values to a list. For example, in the City field, when I type **lo**, DynoDex pops in **Los Angeles**. For Los Alamos, all I need to do is keep typing. Each field also contains a pop-up list of these values. Other new features include an option to open to a default file; an option to bring up the Find dialog box when you start the

program; the ability to use wild-card characters in the Find dialog; and provisions for dialing telephone credit card numbers.

DynoDex 2.0 adds extensive selecting and marking tools so that you can print only a portion of a database. By clicking next to a name in the Just Names list, or by clicking on a check box in the entry screen, you can mark a record for selection and printing. You can also use the Select function to search for specified criteria, and you can mark records in one operation.

The original DynoDex was the first application that printed double-sided address book pages. The current version adds print formats for Avery mailing labels, envelopes, index cards, and lists. Version 2.0 gives you control over the font, size, and style of each field. Portfolio Systems has included 44 pre-designed print formats, including specialized formats for the Apple StyleWriter and the Hewlett-Packard DeskWriter.

Printing from DynoDex is usually straightforward, but there can be some snags when printing double-sided address books. To Portfolio System's credit, the manual and Print dialogs have diagrams that help, but it's still easy to mess up and put the paper in incorrectly. Another problem is that to fully format a print job, you sometimes have to use up to four menu choices and dialog boxes. Some consolidation of functions would be a great help here.

DynoDex could still use some improvements, including some things that its competitors already have. The program doesn't automatically format phone numbers, or print sheets of return address labels, or let you list contacts by either (or both) name and profession, as does Address Book Plus 2.0. DynoDex files cannot be shared over a network. Although DynoDex 2.0 has improved its dialing capabilities, they don't match those provided by QuickDex II. And DynoDex doesn't export to personal organizers such as the Sharp Wizard or the Casio Boss.

With DynoDex 2.0, Portfolio Systems has markedly improved on what was already a good product. While it's not perfect, it is a fine product that is well worth the money. Recommended.—TOM NEGRINO

ADDRESS BOOKS

	DynoDex 2.0.4	Address Book Plus 2.0
File size after import	129K	245K
Import 1000 records	46	32
Sort 1000 records	5	13
Open application	11	24
Open DA	8	39

Test conditions: Macintosh SE/30, 8MB of RAM, System 7, extensions off, disk cache at minimum. Times in seconds.

Address Book Database

Address Book Plus 2.0

PROS: Prints in many different formats; can list by name, company, and/or profession. **CONS:** Cluttered interface; inadequate documentation. **COMPANY:** PowerUp Software (415/345-5900). **REQUIRES:** Mac Plus; System 6.0. Recommended: Hard drive. **LIST PRICE:** \$89.95.

ADDRESS BOOK PLUS 2.0 ADDS many features that improve the address book database and provide a great deal of flexibility. But Version 2.0 also adds complexity, and its cluttered interface makes the program difficult to understand and use.

Address Book Plus 2.0 now offers double-sided address book printing in a variety of formats, including Filofax, Day-Timer, Lefax, and Day Runner. You can order pin-feed and laser paper from PowerUp. There is also a format that makes 5½-by-4¼-inch double-sided address books with standard letter-size paper. You need to cut and fold the pages, but it's a straightforward process. PostNet bar codes have been added for envelopes.

PowerUp has improved the import and export capabilities; you can change the field

order, and it can translate your HyperCard Address stack into a text format for easy import. Version 2.0 offers a four-level sort capability, and you can find and replace data.

New fields for data entry have been added, including a fourth phone-number field and a field for identifying codes, such as *H* for home and *P* for pager. Other changes are automatic capitalization, the ability to change the field-tabling order, and an expanded area for notes.

The program is significantly more functional than the previous version. One of Address Book Plus's strengths is that it can list a particular person in an address book by name, profession, or company, or any combination of the three. One user, a film producer, uses this feature for his production crew contacts; all his camerapeople are listed together, as are all the electricians, grips, and so on.

Address Book Plus has a number of problems. It is annoying to have to switch between two overlapping windows to enter data; on a Classic-size monitor, the data entry window completely covers the Browse window. The ability to search and mark records by category for later printing is obscured by a confusing dialog box. Dialog boxes that make you check many choices in order to accomplish a single task are everywhere, and they clutter and unnecessarily complicate the interface.

The Address Book desk accessory is a real disappointment. On the plus side, you can enter, delete, and modify addresses, and telephone dialing is much better. But while the previous version was slow, version 2.0 isn't a significant improvement. On the 1000-record test file, the Address Book DA took 39 seconds to open; DynoDex 2.0 opened the file in under 10 seconds (see "Address Books," above). To make the DA usable you must leave it open all the time.

A big gripe concerns both the program and the manual. Printing double-sided address books is a major addition to version 2.0, yet it is poorly documented. It is confusing, and there isn't a single diagram of the process in the manual, the supplement, or the program. DynoDex documents the same process (although the process is a bit easier) with plenty of pictures in the manual and on screen.

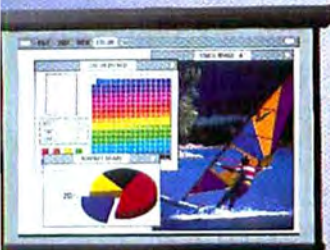
Address Book Plus was a worthy competitor of DynoDex and other address managers, with features no other program could match (see *Macworld*, June 1990). Version 2.0 still has many strengths, but it has become more complex and harder to use, and the competition has caught up. It is a superior choice if you need to sort and list your contacts by profession or company. If this feature isn't important to you, check out the competition before you invest in Address Book Plus.—TOM NEGRINO



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Outliner

Acta 7

PROS: Supports System 7's publish and subscribe capabilities; plays and records sound notes; saves and opens many file formats; low RAM overhead.

CONS: One confusing keyboard command. **COMPANY:** Symmetry Software Corporation (602/998-9106).

REQUIRES: Mac Plus; System 6.0.5 (System 6.0.7 for sound; System 7 to access all features). **LIST PRICE:** \$149.

THE BEST THING ABOUT THIS System 7-savvy update to the Acta Advantage outliner is its ability to publish and subscribe to data. The next-best thing is its ability to incorporate sound in outlines. Combined, these features promise improved efficiency for workgroups because everybody can see and, to an extent, even hear what everybody else is doing.

Acta 7 is a straightforward outliner. With nary a bell or whistle, it does what outliners do: it helps the user arrange thoughts hierarchically. The program uses the metaphor of a family to describe relationships between ideas: the terms *mother*, *daughter*, *sister*, and *aunt* make it easy to visualize and remember the connections between parts of the outline. Additionally,

when ordering outline elements you can label them with decimal numbers, bullets, or the system of roman and arabic numerals and letters that we all learned in school.

What's exciting about an outliner that supports publish and subscribe is the way it enables members of a group to work independently on separate facets of one project and have their revisions immediately appear to other networked group members. Each participant in a project can keep up with changes without exchanging reports.

Acta's publish and subscribe can also be useful to the solo Acta user—increasingly so as System 7-savvy applications proliferate. Portions of an outline can be linked to other types of data residing on the hard drive—graphics, spreadsheets, databases, and word processor files.

Acta 7's ability to play, record, and publish sounds makes it promising for collaborative arts such as film, video, and sound design. Unfortunately, the only way to get sounds into an outline is to record them into a sound-capable Mac; you cannot paste or drag a sound file into a topic in the outline.

Another feature that makes Acta 7 a good workgroup tool is the ability of its format drivers to convert Scrapbook, More, ThinkTank, and text documents into Acta files. Acta 7 can also save its native files in 11 different formats, including MacDraw, Microsoft Word RTF, MacWrite, Mi-

crosoft Works, and WriteNow. To use a format driver, choose Save As from the menu bar and choose in the dialog box an icon that corresponds to the relevant application. That's a nice small touch; seeing an icon makes the mental connection intuitive and direct.

If you customarily use keyboard shortcuts such as ⌘-S to save and ⌘-W to close documents, you're bound to encounter an annoying feature of Acta 7's user interface. The first time I typed ⌘-W in Acta to close a document, it created a new sister heading instead. The Preferences dialog box under the Edit menu contains a Command Keys button, which brings up a dialog box offering the choice to designate either ⌘-S for save and ⌘-W for new sister heading, or ⌘-S for new sister and ⌘-W for save, but those are your only options; you can't assign some other combination that you might prefer. Either way, a common keyboard shortcut gets assigned to an unexpected function.

Acta 7 doesn't have More's rich word processing functions or Inspiration's diagramming ability, but Acta 7 is easy to learn and use, relatively inexpensive (compared to More 3.1, which retails for \$395, and Inspiration at \$295), and doesn't compete with System 7 for much RAM. For a networked group collaborating on a project outline, especially one that involves sound, Acta 7 is the ideal tool.—CARY TENNIS

Map-Drawing Program

Azimuth 2.0

PROS: Creates excellent maps; valuable designer's tool; 30-day money-back guarantee. **CONS:** Not compatible with four-color prepress; interface somewhat obtrusive; documentation needs work; anything smaller than a state must be hand-drawn.

COMPANY: Graphsoft (301/461-9488). **REQUIRES:** Mac Plus; second disk drive; System 6.0.2. Recommended: 2MB of RAM. **LIST PRICE:** \$395.

AZIMUTH IS A VALUABLE TOOL for generating custom maps of the earth's surface in any one of nine cartographic projections, viewed from any point in space. Created by Dick Furno, a cartographer for the *Washington Post*, Azimuth produces maps that meet the quality standards of most major newspapers and newsmagazines. Shortcomings restrict the current version's usefulness, however.

Azimuth is a set of very accurate, mathematical base-map outlines of continents, nations, the 50 U.S. states, and Canada's 10 provinces and 2 territories. The user selects which outlines to plot and designates the scale and dimensions of the finished map. The more outlines chosen,

the longer the map takes to plot. A Mac IIci with DayStar Fast Cache plotted all continents in about 40 seconds; plotting all nations took nearly 3 minutes.

A skilled cartographer can produce elegant maps with roads, lakes, and other details; symbols from Azimuth's library can be placed precisely to mark points of interest. The program supports solid and patterned fills and 256 colors, and it exports PICT, EPS, and DXF formats.

It takes practice to learn what scale, distance, and viewing angles produce a good map. It took me several tries to plot a perspective map of the earth that lay entirely on the page. Then I changed the viewing angle, and the map fell off the page again.

Azimuth's documentation is weak in places. The tutorial is helpful, but one lesson ends before explaining how to place the type shown in the example. The documentation mentions adding type to the base map, so I gave it a try—with awful results. (It's better to work on the finished map.)

The manual also refers to submenus as pop-up menus and states incorrectly that EPS-export supports only the standard LaserWriter font families. You're advised to save a copy of the base map under a different name so as not to alter the original (instead of using Get Info to lock the base map files). And the projections appendix does not illustrate all nine available projections.

Azimuth's interface is awkward in spots. I still can't get the hang of its unorthodox cropping procedures and its use of menu commands (instead of the now-standard eyedropper) to sample colors. And the Layers dialog box lacks a Cancel button.

What's more, Azimuth EPS files do not meet the needs of four-color prepress. You can place color EPS files in QuarkXPress layouts and print them in black and white, but the colors are not identified by CMYK or RGB values and so cannot be separated. (Adobe Separator can't help either.) I succeeded in getting separations by exporting an Azimuth map in PICT format, opening it in MacDraw Pro, assigning CMYK colors, saving it in EPS, and placing the file in QuarkXPress.

My experience with Graphsoft's technical support was mixed. Twice, promised callbacks never came. Then the first technician I spoke to conveyed inaccurate information, but he did refer me to another technician, who called me back with the solution to my problem.

Despite the interface and documentation, Azimuth is an excellent tool for designers working with black-and-white or color maps. In a newsroom where maps are used frequently, Azimuth would quickly pay for itself. Most other users should hold out for the next version's improvements before they part with \$395.—BILL JUSTIN

Ecology Education Stacks

Earthquest Explores Ecology

PROS: Important topic; easy HyperCard interface; lots to explore. **CONS:** Some aspects superficial; graphics and interface could be more engaging for kids. **COMPANY:** Earthquest (415/321-5838). **REQUIRES:** Mac Plus; hard drive; System 6.0.5. Recommended: 2MB of RAM. **LIST PRICE:** \$59.95.

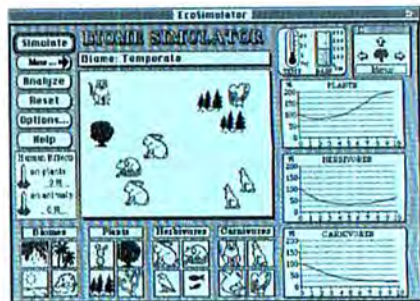
EARTHQUEST EXPLORES ECOLOGY teaches kids the basics of ecological science and related issues through animated simulations, games, graphics, and digitized sound. It's a neat idea, but the execution could be stronger and more polished. Earthquest Explores Ecology probably won't retain kids' attention enough to warrant \$59.95 to home users, but middle- and high-school science teachers could usefully bring it into their classrooms to add some computer-interactive spice to standard textbook learning.

Ecology is a collection of HyperCard 2.1 stacks bound together by ecological themes. It contains dozens of activities and topics for kids to explore, some of which will captivate them and teach them some-

thing significant. The Brazilian Rainforest, for example, lets kids explore by clicking on labels and pictures for information on everything from the forest canopy, to indigenous flora and fauna, to endangered wildlife. The EcoExplorer also has solid value, explaining the workings of complex ecosystems—from polar to desert to urban.

Some half-dozen of the games take just two or three minutes to play, such as Picture Matcher, where you match plants and animals to their names, and Name That Howl. On the other hand, the Animal Population, Human Population, and Biome simulations constitute valuable classroom instruction. The Biome simulation allows kids to put various plants and animals into an ecosystem and see how each population is affected by the environment and other life in it. Teachers will still want to supplement the simulations with handouts and explanations.

Most of the stacks contain special buttons that enhance the current topic. Click on the Speaker button to hear sounds associated with the featured environment—the caws of an exotic rain-forest bird, or the *whoop-whoop* of a jungle-dwelling primate. The Thumbs Down button offers down-to-earth explanations of environmental problems, from the depleted ozone layer to deforestation. The Thumbs Up button gives positive news about environmental progress and suggests how kids can be environmen-



Environmental Building Blocks The Biome Simulator lets kids assemble plant and animal life to build a range of ecosystems. Click to see Ecology's predictions of how each species will fare.

tally responsible citizens, including books to read and organizations to join.

More attention to design would have made Ecology more engaging to the young people who will use it. For instance, many of the card layouts are busy and cluttered, making them difficult to comprehend. Some of the graphics and digitized images are fine, but there is little color, a particular drawback for a kid-oriented program.

With better graphics, plus more-engaging games and stronger editorial content (some of the text is a bit technical), Earthquest Explores Ecology could make a great classroom tool, and even find a place in education-minded homes.—HELMUT KOBLER

Arcade Game

Glider 4.0

PROS: Very entertaining; excellent graphics; supports joystick; multichannel sound; includes game editor. **CONS:** Manual needs polish; clumsy System 7 help. **COMPANY:** Casady & Greene (408/484-9228). **REQUIRES:** Mac Plus; System 6.0.2. **LIST PRICE:** \$49.95.

GLIDER, BY JOHN CALHOUN, IS A delightful, peaceful arcade game that has been available as shareware since December 1988. Glider 4.0, available now from Casady & Greene, is surely destined to become a commercial classic.

The object is to fly a paper airplane through a house and escape to the outdoors, avoiding stationary obstacles such as tables and flying hazards like balloons and paper copters. Every room requires a different strategy. Is the hot-air vent close enough for you to catch an updraft? Can you collect an extra glider by grabbing a piece of paper without crashing into a bookshelf?

You have just four controls—forward, reverse, energize, and fire rubber bands; the challenge is in learning to use air currents to fly a plane without engines. Using the keyboard, mouse, or a joystick for control,

you stay aloft by gliding into hot-air columns provided by vents and candles. These propel you upward, but you have to maneuver skillfully to attain just the right height so you can make it to the next column. Some of the rooms are drafty, so you might find yourself being whooshed down a staircase or up through a transom. If you have trouble visualizing the air currents, there's an option to make them visible.

Some rooms contain objects that you can pick up for extra points, extra gliders, or extra power to fly out of a tricky situation. You also earn points for sailing through a room quickly. Be on the lookout for rubber bands, too; you can use them to get points for bringing down airborne hazards.

At \$49.95, Glider is a great entertainment value with appeal to gamers of all ages. Its graphics and sound are excellent, often humorous. One of my favorite audio effects is the Zen-like sound of a paper glider passing by an electric guitar.

Glider's home-style manual lends a personal touch to your gliding experience (though it does cry out for editorial and design help), conveying the feeling of learning game skills directly from a programmer who hopes to enhance your thrill of discovery. Surprises abound in Glider, so the manual warns you to skip the section on the Room Editor (for creating custom houses) until you've mastered the game.

Glider's System 7 balloon help has great content, but on a small screen the application's menu bar partially obscures it. I also observed a screen-dissolve problem that momentarily interfered with menu bar operation. Fortunately these interface weaknesses do not detract from the game play. I would like to see an Enter at Room X option added, for players who just can't master a certain room. This would help prevent frustrated gamers from giving up on Glider and moving on to other games.

The big surprise included with Glider 4.0 is Room Editor, a graphic programming tool that lets you experiment with game design. Room Editor includes everything you need to assemble a custom house to fly around in. My first three-room house—including a Mac's Headroom entertainment center sporting multiple TV sets, hot-air vents, and strategically placed fishbowls—took only a few minutes to construct. The only problem I had was that I kept thinking I should be able to double-click on objects to access their customizing dialog boxes. Piloting my glider through the minihouse was as much fun as building it had been.

Glider 4.0 is a great flying game. The Room Editor extends its life indefinitely, providing wonderful entertainment value for your gaming buck. This homegrown harvest of fun will be a welcome addition to any game library.—TONI THOMPSON

Power Up Your PowerBook



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You've just purchased one of the most sought after notebook computers ever made—Apple's new PowerBook. You bought it for the freedom it affords you, but you're frustrated by its limitations. Although equipped with powerful System 7, the PowerBook's storage and memory configuration barely allows you to do anything beyond booting up.

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Roadrunner 40i and 80i internal drives feature state-of-the-art 2.5" disk technology with 19ms access times. *Coyote* memory upgrades, designed

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Circle 127 on reader service card

Color Hand Scanner

PageBrush Color for the Mac

PROS: None. **CONS:** Balky; unwieldy, poorly documented hardware and software; abominable technical support; expensive. **COMPANY:** Mouse Systems Corporation. **REQUIRES:** Color Mac with math coprocessor; 2MB of RAM; hard drive; System 6.0.3. Recommended: 4MB of RAM. **LIST PRICE:** \$799.95.

THE BEST PART OF MOUSE SYSTEMS' manual is the first sentence: "Mouse Systems believes in the quality of its products." If the PageBrush Color is any indication, the company must also believe in the tooth fairy. After submitting this hand-held scanner to lengthy tests, I discovered that no matter what I tried, launching the software (a jury-rigged edition of Olduvai Software's VideoPaint) resulted in a series of error messages. "Out of error handle," one said helpfully. "Not enough disk space, you will return to the Finder," said another (with 10MB of space available). "Fatal Error," said a third. (My thoughts exactly.)

Eventually, after unsuccessfully trying three different Mac models, three different

PageBrush units, System 6, System 7, and 1000 configurations of my SCSI chain, I was sent a prerelease copy of some new software that made the unit work. (If you're one of the hapless 200 who already bought the PageBrush, call the tech-support line and demand the update.)

Along the way, I called the tech-support line. The impatient technician asked if I'd correctly installed the NuBus board. I told him there *was* no NuBus board, that the PageBrush was a SCSI device. He then asked if my disk was compressed. I explained that I keep some of my files compressed with DiskDoublers and StuffIt, but... "No," he interrupted, "not files. Is your *disk* compressed?" (A PR person later apologized, telling me that this support person was a temp, and that the company was "undergoing some changes." Nonetheless, the same person was on duty six weeks later.)

I did finally get the thing to work when I removed all the INITs from my System Folder. (I spent a full workday trying to find out which specific INIT was causing the problem—an impossibility, since a particular configuration sometimes worked and sometimes failed.)

Unlike its monochrome counterpart, the color PageBrush program does not automatically stitch together the image as you wipe the scanner across the page. Af-

ter a moment, the image appears on the screen larger than actual size because of the scanner's 200-dpi maximum resolution. (Black and White mode sometimes fails to work at all, producing only a cloud of random black scratches at the top of the screen.)

In Full Color mode, a color image does indeed appear in the VideoPaint window. The one good idea of the package was adapting a real color paint program—VideoPaint—as the software. That way, once you scan an image, you can immediately start to edit it, finally saving it in PICT, TIFF, or another format. (And do remember to save the file. VideoPaint does not prompt you to save a file when you first close it—it just discards your work.)

Don't bother fiddling with the Mode or DPI buttons on the hand unit in an effort to make it work better. They don't do anything, according to the company. Changing some settings in the VideoPaint scanner dialog box won't help either—most of them are grayed out in Full Color mode. (What good do hue and saturation controls do you in black and white, anyway?)

It's a wonder anybody let this package out the door. You wind up wishing that Mouse Systems would test, polish, and support its products—instead of just believing in them.—DAVID POGUE

Interactive Magazine

Verbum Interactive 1.0

PROS: Beautiful graphic design; clear navigational structure; innovative interactive video roundtable. **CONS:** Very slow; uneven quality; interaction limited to non-sequential reading. **COMPANY:** Verbum. **REQUIRES:** Mac II; 5MB of RAM; 8-bit color; CD ROM drive; headphones or speakers. **LIST PRICE:** \$49.95.

VERBUM INTERACTIVE, AN INTERACTIVE interpretation and extension of *Verbum* magazine, is a two-CD set that incorporates text, graphics, audio, video, and animation. The set is organized into six main sections: feature stories, in-depth studies that include printable text, sound, video clips, and animations; a collection of multimedia projects from artists, vendors, and students; columns by *Verbum* editors, which include printable text and sample multimedia files; demos of products; a database of products and services; and a sort of multimedia museum shop, where you can browse and order other *Verbum* products, including books and back issues of the paper version of the magazine. Verbum Interactive does a lot of things right; it just does most of them too slowly, at least on my Mac II system.

Verbum Interactive's graphic design is exciting, easy to understand, and extremely readable on screen; and at every turn it showcases what can be accomplished. Plus the audio is terrific—there are 20 digitized audio segments that range from the ethereal to the seriously urban (including one track that my friend insists is the men-at-work theme from Bugs Bunny) as well as stereo tracks from Todd Rundgren, D'Cückoo, and others.

And you don't need a manual; the table of contents is laid out like a map, with icons representing each story clearly arranged hierarchically. Clicking on an icon opens a window that describes the story; a second click takes you to the selected story. You can also easily navigate each story and jump to others.

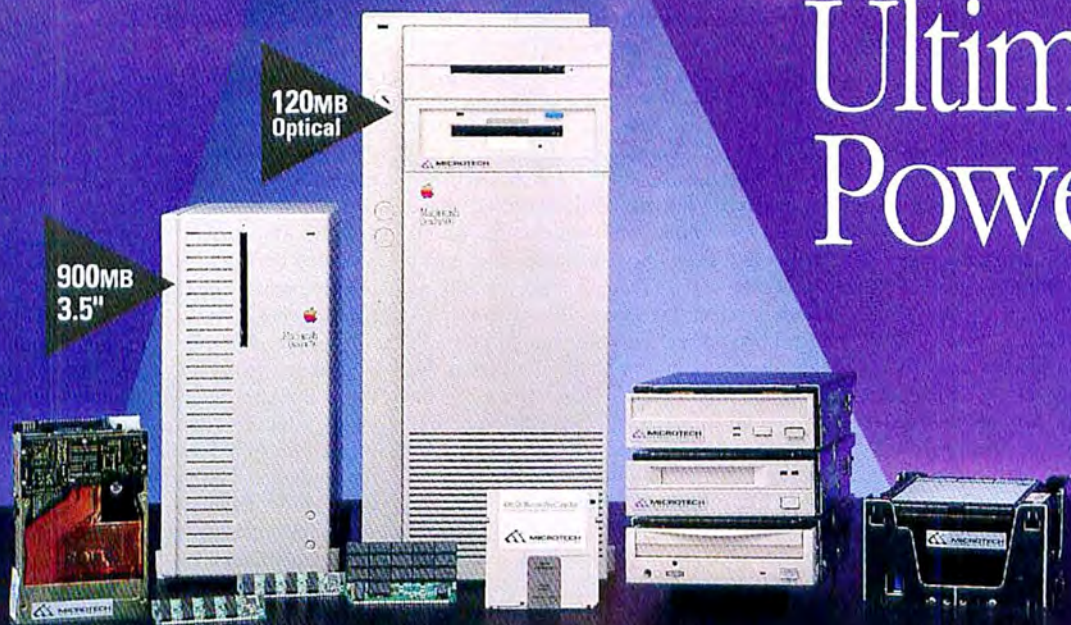
The features and columns both have a small but readable text box and supporting graphics. As you page through the text, a running-figure icon appears whenever there is an accompanying animation. These sections were the strongest; they were informative and used multimedia elements well. The regular column "Secrets of the Universe Revealed," for instance, is a tutorial on using Adobe Photoshop to create fancy type effects. I read the same article in the paper *Verbum* (issue 4.3), and found the interactive version clearer and much more interesting to read. And the "Verbum Round-

table" is an engaging panel discussion among six multimedia industry pundits. For each question asked, you can click on a picture of each participant and watch a video of their response. (Created with CoSA's PACo Producer, this is a pre-QuickTime video document, and an exciting example of things to come.)

The Gallery and Demos sections are a mixed bag. Some of the contributions are great, like the Living Photos exhibit of Graham Nash's photography, or the goofy collection of student work from Pasadena's Art Center College of Design. Others just aren't up to the quality of the rest of the magazine. And although some of the product demonstrations are well organized and informative, others are slick marketing sequences or limited versions of actual products.

All in all, I would recommend Verbum Interactive to anyone who wants to see a first-rate graphic and navigational design example or is interested in exploring the intersection of art, computer graphics, and interactive publishing (quarterly versions should be available starting in January 1992). But to anyone interested in reading the magazine, I'd say stick with the paper version. Waiting 30 to 60 seconds for many of the section transitions makes reading Verbum Interactive a frustrating experience.—LIZA WEIMAN

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Circle 80 on reader service card

Arcade Game

Aqua Blooper Piper

PROS: Colorful graphics; great sound effects; nonviolent theme; challenging for kids. **CONS:** Challenge may not sustain adult players. **COMPANY:** Casady & Greene (408/484-9228).

REQUIRES: Mac Plus; second disk drive; System 6.0.2. **LIST PRICE:** \$49.95.

DESPITE WHAT YOU MAY think, it's not always easy to review computer games. There are no features to analyze, no benchmarks to run—nothing on which to base a rational, objective critique. It's a matter of personal taste; you just like a game or you don't. Keep that in mind.

Aqua Blooper Piper, from Casady & Greene, is amusingly offbeat in theme, equipped with colorful graphics and great digitized sound, and refreshingly nonviolent to boot. Nonetheless it left me uninspired.

In Aqua Blooper Piper you play the part of a plumber—not the most glamorous role, perhaps, but a noble one in today's water-conservation-conscious world. And as real plumbers often do, you find yourself in a fussy customer's basement, confronting a water-leak crisis of major proportions. On the two facing walls are wide-open pipes. In

a few moments your impatient client is bound to turn the faucets on. Your job is to bridge the span from one wall to the opposite one before water starts to flow.

To do this, you have to install new plumbing fast. A conveyor belt moves slowly across the bottom of the screen carrying vertical pipes, horizontal pipes, curved pipes, terminator pipes, and connectors of all shapes and sizes. Pick up a piece and, using the keyboard to turn it right or left as needed, attach it to the wall's existing piping. Then go grab another segment, though this piece is bound to be different from the last and may not be ideal for the job. You have to take it anyway, being desperate, but be prepared for the consequences: the mish-mash of twisted and contorted pipes looks more like modern art than plumbing.

All the while, the clock is ticking. If you're too slow in placing pipe, segments fall off the conveyor and you lose points. Fail to complete the span within the time limit, and the water valves open and water gushes to the basement floor—game over. If you connect the wall pipes before the clock runs out, you're ready for the moment of truth: open the valves yourself, and see if the water flows through without a leak. If your system is sound, you win points for a good clock time (and extra points for greater complexity). Then it's on to the next troublesome basement—with a shorter time limit.

Aqua Blooper Piper's impressive graphics and sounds give the game a slick polish. The musical sound track is hip and fun, and the sound effects, such as the clink-clank of a dropped pipe and the dreaded chorus of rushing water, liven game play, too. The game runs in black and white, but to really appreciate it you need a color Macintosh. The rainbow graffiti scrawled on the basement walls, the gushing blue water, and the metallic pipes are all nice touches.

But good graphics and sound can carry a computer game only so far. A game's real value ultimately comes down to how well it keeps your attention, and Aqua Blooper Piper didn't hold mine very long. Though the game has the requisite elements of suspense and challenge—the race against the clock, the concentration on fitting the pipes in the way that makes the most sense—they don't succeed in making play engaging. I tired after only a handful of tries.

But remember the personal taste issue. I've never been a great fan of games that are based on manipulating shapes in a hurry—this includes such popular titles as Electronic Arts' Pipe Dream and Spectrum HoloByte's Tetris. People who find this genre of game addicting might do well to take a look at Aqua Blooper Piper. As for me, I'm going to keep shopping for a different kind of challenge.—HELMUT KOBLER

Interactive Game

3 in Three

PROS: Challenging and creative puzzles; beautiful graphics; entertaining animated scenes. **CONS:** Sometimes too easy; sometimes mentally taxing.

COMPANY: Inline Design (203/364-0063). **REQUIRES:** Mac Plus; Mac II and 2MB of RAM for color; hard drive; System 6.0.5. **LIST PRICE:** \$49.95.

3IN THREE IS NOT AN ADVENTURE game, an arcade game, or an interactive movie. So what is it? Inline Design calls it an "interactive treasure hunt." To me, it was more of an ultramodern *Alice's Adventures in Wonderland*.

It begins when the number 3 is zapped off her comfortable spreadsheet by an unexpected power surge. Yes, it's a high-tech rabbit hole, and this modern Alice lands in her own sort of Wonderland, populated by letters with personalities and other fantastic characters, and set amid Cliff Johnson's whimsical images of a computer's innards.

However, this is where 3 in Three becomes a game. In Lewis Carroll's *Wonderland*, the puns, puzzles, anagrams, and logic problems were there simply to amuse the perceptive. In 3 in Three, the player (representing the number 3) must solve a

puzzle before the story can continue. And the puzzles are wonderful.

They range from simple codes to intricate conundrums. There are word puzzles, logic puzzles, pattern puzzles, and a few more that are undefinable. There are fast-paced character recognition tests, variations on classic brainteasers, jumbled-word games, and plenty of riddles. In some cases, understanding the puzzle is half the solution. If you like puzzles, you will love 3 in Three.

A few of the puzzles are too easy. A few are easy to figure out but take a long time to finish. A few require flashes of insight (which, of course, do not always come on schedule). But most of them are amazing. They're creative, fun, entertaining, and best of all, challenging.

After you complete each puzzle, you are rewarded with a brief animated scene. The scenes are clever and humorous, filled with puns and the amusing complaints of 3 (who just wants to find her way back to the spreadsheet). But because you don't have to solve the puzzles in strict order, the scenes aren't progressive steps in a story. Each one is completely different, though the scenes don't further the plot, and by the end of the game they get a little repetitive. Still, this repetition is more than compensated for by your ability to skip a particularly frustrating puzzle before you start clenching your

teeth, pulling out your hair, and swearing at your computer.

The graphics for both the animation and the puzzles are beautiful, although it wasn't always clear to me what they represented. Still, this is part of the slightly surreal flavor of the game. On a color monitor, some elements are vivid, almost garish, while others are soft and muted.

The sound effects throughout the game are fun, including captions that "pop" into existence and some expressive squeaks, but after three or four hours of playing the game, you might want to turn them off. Fortunately, Inline Design has provided that as an option.

I discovered one bug, but you'll find it only if you're using a Mac Plus. On a Plus, if you quit without saving the game, your system might reboot. Inline Design is working on it, and by the time you read this, it might even be fixed.

3 in Three is not for everyone. Hand-eye coordination counts a little bit, but not nearly as much as concentration and planning. Randomly guessing answers will get you nowhere, and some puzzles can take a frustratingly long time to figure out. But if you like puzzles, 3 in Three is an obsessively good set of them. I found myself getting up early for extra playing time—words that will shock anyone who knows me.—WENDY SHARP

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Backup Utility

Backmatic 2.01

PROS: Easy automated daily backup; backs up to shared volumes; timed execution; extensive file filters. **CONS:** Can't back up to tape; no built-in file compression. **COMPANY:** Magic Software (402/291-0670). **REQUIRES:** Mac Plus; System 6.0.3. **LIST PRICE:** \$99.95.

IF YOU'RE LIKE ME, ROUTINE backups are the last thing on your mind. Never mind that losing, damaging, or accidentally trashing files can mean the loss of days, even weeks, of hard work. Backmatic is a neat little utility that makes a tedious chore simple and painless.

Magic Software markets Backmatic as a supplement to an existing backup routine rather than as a full-fledged backup program, primarily because it doesn't support tape drives or compress files. Backmatic is a Control Panel device and can be configured in a number of ways to back up the contents of any attached volume automatically or manually. The backup medium can be any mountable device in the Finder—a floppy disk, a hard drive, a removable cartridge drive, or an optical drive.

Setting up Backmatic is straightforward. The first step is determining which

files to back up. Backmatic offers two types of incremental backup, Scan and Filter. Using Scan, you designate which volumes and folders should be checked for new or modified files. Filter lets you specify files for backup according to their type and creator.

Next you decide when and how often you want to back up. You can back up once a day at a specified time or at regular intervals. Choosing the frequency is not as simple as selecting "every 15 minutes" from a dialog box. Instead, you set the number of backups in a span of hours, say, five backups between 1 p.m. and 7 p.m.

Backmatic's speed and features, with the exception of file compression, compare favorably with backup packages such as Dantz Development's Restrospect and Fifth Generation Systems' FastBack II. Like them, Backmatic performs both full and incremental backups, but the simplicity of the latter is a real strong point. Another neat feature is Backmatic's ability to automatically mount and back up to a file server.

Backmatic is especially good at reminding the forgetful to perform routine backups. It unobtrusively reminds me every day, before shutdown, that I need to back up, and even offers the option to decline. On a daily basis, this is all the interaction you have with the application. Choose Shut Down from the Finder, and a dialog box asks if you want to proceed with the backup

using the specified settings. Backmatic then speedily scans your hard drive to determine which files were modified or created since the last backup; and one or two disk-swaps later, you are completely backed up. On an average day my incremental back-ups take three minutes or so, with new and modified files fitting conveniently on one floppy. Backmatic has no file-compression routine of its own, but it's easy to add that feature by using Backmatic in conjunction with DiskDoubler or StuffIt Deluxe.

To test Backmatic I ran a full backup of several folders containing my most important data—checkbook information, address books, and a recipe for an eggplant frittata. Backmatic took close to 12 minutes to scan my 80MB hard drive completely and back up the 10MB of selected data—about the same time as with FastBack and Retrospect.

Compared with Retrospect Remote (\$249) and FastBack (\$189), Backmatic, at \$99.95, is clearly a great value for those whose backup needs are moderate. If you require data compression, the decision becomes somewhat cloudier. If you need to buy StuffIt or DiskDoubler to gain compression capabilities, you might as well get one of the higher-priced packages. But if you already own one of those applications, or if simple backups meet your needs, then Backmatic may be just the ticket for your peace of mind.—MATTHEW R. CLARK

Statistical-Analysis Program

JMP 2.0

PROS: Strong on both classical statistics and visualization; includes 3-D spin features; includes quality-control statistics. **CONS:** Meager nonparametric set; no time-series analysis.

COMPANY: SAS Institute (919/677-8000). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive. **LIST PRICE:** \$695.

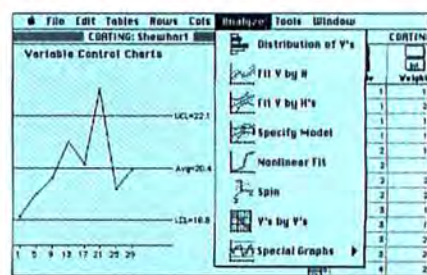
THE FIRST VERSION OF JMP HAD two principal strengths: it rigorously employed the modern statistical notion that it's critical to explore data graphically before simply pouring numbers into a routine, and the first version featured an interface designed to anticipate a user's most likely statistical approach. After you enter or import data into JMP's spreadsheet-style data tables, you typically select an analysis mode from the Analyze menu (the choices are Distribution of Y's, Fit Y by X or X's, Specify Model, Nonlinear Fit, Spin, Y's by Y's, and Special Graphs). When the plot associated with the analysis appears, it includes buttons and pop-ups you can activate for further study. For example, if you pick Y's by Y's, you will see a screen with buttons for Correlation, Scatter Plot Matrix, Inverse, and Partial Cor-

relation, and for an outlier plot. You might get the information you need simply by clicking on Correlation, or check the other options for more-detailed information.

The interface anticipates not only the questions you are likely to ask about your data, but also the order in which you are likely to ask them. JMP's manual is a model of concise clarity in explaining these questions, and the interactive Help system puts most of this information on screen when you need it.

JMP shines at any analytic task that's equivalent to linear or nonlinear regression analysis (see "Pictures Worth 10K Words"). In version 2.0, new types of tests have been added to the Special Graphs selection: three nonparametric tests, Pareto charts and Shewhart-style control charts for quality control, and response surface analysis. Bar charts and pie charts are now provided so that you can create simplified presentations of results, although JMP's tools for annotating statistics charts help display results for a nonmathematical audience. File import has been simplified, and SAS will supply, on request, Macintosh Communications Tools with which experienced Macintosh users can log data directly from analytical instruments.

JMP is easy to use, but it comprises a formidable assortment of functions. There are packages with longer lists of tests



Pictures Worth 10K Words JMP expects you to pick your statistical tests from this set of graphical icons under the Analyze menu.

(SYSTAT, for example), but JMP puts a long list of the most useful analyses right at your fingertips, and makes a credible attempt at teaching you to use them. It's not cheap (there's a case-limited, lower-cost student version called JMP In, and academic site licensing), but it delivers lots of value for the money—the Spin option alone could sell for several hundred dollars as a stand-alone 3-D data-analysis program. Significantly, JMP's visualization features are carefully coordinated with numerical statistics that follow the text-and-tables approach of traditional textbooks, so it serves a wide range of classroom purposes. JMP is one of the rare programs that accommodates both beginners and experts, an admirable effort indeed.—CHARLES SEITER



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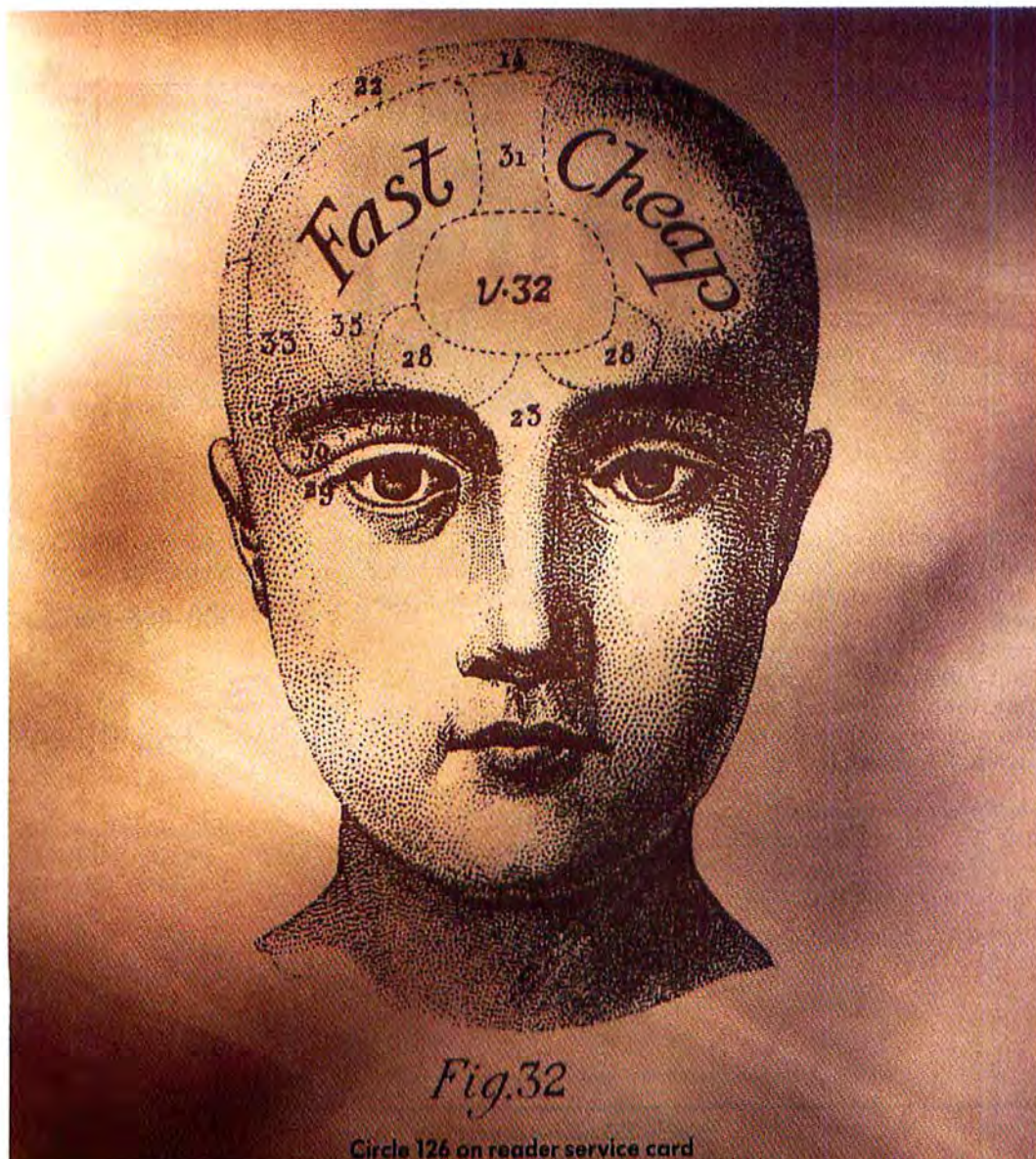
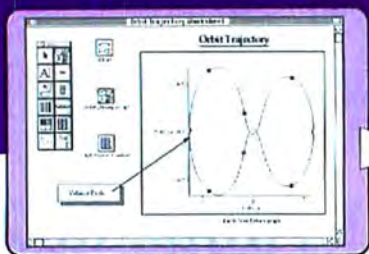


Fig.32

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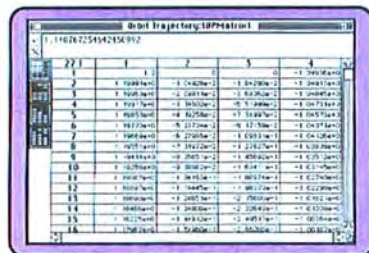
Just a click accesses any tool, data, or editor from HiQ's Project Worksheet interface.



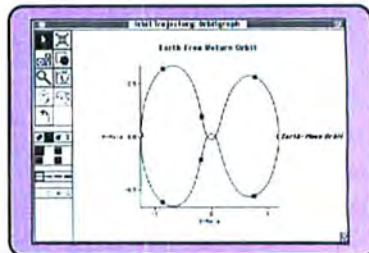
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Interactive Videodisc

Michelagnolo: Self-Portrait

PROS: Interesting film on Michelangelo; extensive still-frame collection of his works; recorded translations of many of the artist's writings. **CONS:** HyperCard interface provides good access to all materials but adds no information of its own; no program documentation. **COMPANY:** The Voyager Company (310/451-1383). **REQUIRES:** Mac Plus; hard drive; computer-controlled videodisc player; television; System 6.0.5; HyperCard 2.0.2. **LIST PRICE:** Two-laser-disc set \$99.95; HyperCard Companion \$59.95.

AS A PIECE OF INTERACTIVE programming, Voyager's Michelagnolo: Self-Portrait is no Sistine Chapel. Although this interactive videodisc might not be a multimedia masterpiece, it is still an excellent educational resource as well as an engaging introduction to the great Florentine sculptor, architect, and painter (whose name the title renders in his native dialect).

The package is built around a 1989 film, which provides the package's title and takes up the better part of the set. To round

out the picture, Voyager assembled thousands of still-frame views of Michelangelo's major works plus some 500 of his sketches; translations of his letters (squirreled away on the second, unused audio track of the videodiscs); and an earlier film, *The Titan: Story of Michelangelo* (this takes up less disc space than the 1989 film because it's stored in a format that doesn't allow for single-frame access).

Michelagnolo, the film, skillfully and movingly tells the story of Michelangelo's artistic life in a first-person narrative drawn mainly from the artist's own writings. As he speaks of his physical ordeals, political fears, and constant money worries—as well as his influences, ideas, and ambitions—we learn to appreciate the human being behind the heroic legend of *Il Divino*, as he was known. The other film, *The Titan*, won an Oscar in 1951 but sounds a bit corny today. Made by the same producer, this black-and-white effort offers little information not covered in *Michelagnolo*.

The Michelagnolo HyperCard Companion does a good job of providing access to the contents of the videodiscs. You can search through the stills by title of a work, by medium, year of creation, or other standard criteria.

Tools like the Timeline and Sistine Chapel map let you jump to snips of the film that deal with individual works of art

or episodes in the artist's life. Michelangelo's letters and writings have been similarly cross-referenced so that they too are accessible by subject or date. Teachers will appreciate the Companion's Slide Show feature, which lets you queue up a playlist of stills, motion sequences, and letters and then give a presentation.

The Companion stack's shortcoming is that it offers virtually no content of its own—no criticism or historical information about the works, no background about the times or the individuals in Michelangelo's life, no transcriptions of the letters (it would be nice to know how to spell some of those names). This reference information could have added depth to this package and provided for the type of interplay between text, imagery, and sound that makes great multimedia projects—like Voyager's own Louvre series—add up to more than the sum of their parts.

As it is, Michelagnolo about equals the sum of its parts: a good movie, a good collection of stills, interesting letters, and a useful interface. There's nothing revolutionary here, nothing to make you go out and buy a videodisc player if you don't have one, but the package works. If it contains somewhat less information than a good art book, well, a book can't pan to walk you through the Medici chapel or show you the David in the round.—JOE MATAZZONI

Groupware

Instant Update 1.0

PROS: Users can update documents at their leisure; shows who made changes on a paragraph-by-paragraph basis; uses XTND technology for importing documents; can edit documents offline. **CONS:** Some problems with XTND filters and document formatting. **COMPANY:** On Technology (517/876-0900). **REQUIRES:** Mac Plus; LocalTalk or Ethernet; System 6.0.4. **LIST PRICE:** \$995; two-user pack \$99; five-user pack \$995.

TRADING INFORMATION OVER a network can be accomplished in a number of ways. You can use a file server to have colleagues read or copy the file, you can use a file-transfer program to send a file to a group of users, or you can enclose a file in an E-mail message. But it's next to impossible to see what changes someone has made to your file until they send it back to you. Enter Instant Update.

Instant Update's document server can be installed on any networked Mac to store Instant Update (IU) documents and any changes made to the documents. Any IU user can create a document, store it on the document server, and indicate which IU users should receive a copy. IU then sends

a copy to each recipient, who can make changes to the document.

Whenever you make changes to a shared IU document and click on the Update button, all the recipients of that document are notified that changes have been made. When a recipient selects that document and clicks on the Update button, the changed document is displayed.

Instant Update's interface looks like a typical Mac word processor, with the usual ruler at the top of the document window. You can enter text and change styles, as well as paste graphics and create tables.

You don't have to create documents from scratch. You can copy and paste via the Clipboard, and Instant Update uses APDA's XTND technology to offer filters for reading foreign file formats, such as WordPerfect for the PC, Microsoft Word, and MacWrite formats. I did run into problems, however. Instant Update and MacWrite II, which both use the XTND technology, displayed different formatting for the same imported WordPerfect for the PC document.

The Instant Update server stores copies of all the IU documents and the changes that users make to them. When you open the Instant Update Document Management window on your Mac, you see your IU documents in a folder bearing your name as well as any public doc-

uments (in a folder marked Public). You can also use other folders for storing Instant Update documents, but these folders are located on your local hard drive, not on the server. Instant Update uses an odd mechanism to make these local folders available. It works, but I did not find the procedure intuitive.

Incoming changes (those made by other users) and outgoing changes (those made by you) to documents are indicated in the Document Management window by small arrows added to a document's icon. When you open a document and click on the Update button, the paragraphs containing changes within that document have a vertical bar next to them (in tables, each cell can have a vertical bar). When you click next to the bar, the name of the user who made the changes and the time the changes were made are displayed. Instant Update can also notify you, with a flashing icon in the menu bar or with a beep, whenever someone makes changes to specific documents.

Instant Update is a good way to distribute often-used documents among a workgroup. It's good for handling such things as an order sheet for office supplies, boilerplate docs, a vacation planner, and yes, even the football pool. It just might change the way you track things in your office.—DAVE KOSIUR

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Utility Collection

Now Utilities 3.0.1

PROS: Excellent value; many individual utilities compare favorably with major competitors; addresses many System 7 deficiencies. **CONS:** Complex; redundant elements of different utilities should be combined; manual still needs improvement. **COMPANY:** Now Software (503/274-2800). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.4. **LIST PRICE:** \$129.

VERSION 3.0.1 INCLUDES COSMETIC improvements like color icons, as well as the elimination of three utilities—Customizer, FinderKeys, and PrintPreviewer—and the addition of an installer program and a new utility, NowSave. Since Now Utilities includes ten separate programs and a variety of sample and support files spread over two disks, the installer brings order to what was becoming a chaotic situation. It also displays a description of each utility and tells you how much RAM and disk space each requires. NowSave automatically saves your documents as you work; you tell it which applications you want it to work with, and whether it should save after a specified number of keystrokes, mouse clicks, or minutes.

All the other improvements involve major and minor revisions of version 2 utilities. In version 2, for example, Super Boomerang inserted a submenu of files in any application's Open command and added file-management commands and lists of disks, files, and folders to all Open and Save dialog boxes. Super Boomerang now also adds a submenu to the Apple menu from which you can launch listed applications or open listed files or folders. In addition, Super Boomerang can now search for text within files as well as for file names. In version 2, WYSIWYG Menus displayed menus of fonts, sizes, and styles in the corresponding typeface and organized Font menus by family. With version 3, family members are now listed in submenus (as in Adobe Type Reunion); you can change the order of the names in the Font menus; you can turn the WYSIWYG display off for specific applications or fonts (such as graphic fonts); and font, size, and style displays are controlled separately.

NowMenus has added the ability to pull down standard menus automatically when the pointer passes over them (like CE Software's EZ-Menus). And StartupManager can now link related extensions and define extensions as incompatible so they cannot both be turned on accidentally, and it can automatically turn off extensions that crash during start-up.

Revisions to the remaining utilities are more modest. AlarmsClock is now better-looking and easier to use. Screen Locker now offers a more detailed activity log. Profiler now lets you specify in detail what is included in the summary. MultiMaster now enables you to assign a specific sound level and color depth to each application. DeskPicture is still one of the best utilities around for replacing the desktop pattern with black-and-white or color pictures. Both MultiMaster and DeskPicture have a new look, but are largely unchanged.

On the negative side, the manual is still less than helpful. With so many ways to effect the same or similar changes (three utilities modify menus, for example, and two launch applications and open documents), Now Utilities is in grave danger of becoming needlessly complex. And I still prefer Aladdin Systems' Shortcut, Microseeds' INITPicker, and Connectix's HandOff II to Super Boomerang, StartupManager, and MultiMaster. But I should note that single-purpose utilities can cost as much as, or more than, the entire Now Utilities collection. Thus, despite its mostly minor imperfections, Now Utilities is still a bargain. For this and many other reasons, those who don't already own a comparable collection of System 7-compatible utilities should find version 3, like version 2, hard to resist.—ROBERT C. ECKHARDT

PageMaker and PostScript File Scanner

CheckList 2.0

PROS: Saves and prints reports; downloads fonts with PostScript files. **CONS:** A little buggy; scans only one file at a time. **COMPANY:** ElseWare Corporation (206/547-9623). **REQUIRES:** Mac Plus. **LIST PRICE:** \$179.95.

CHECKLIST 1.0 SHOWED YOU many things about PageMaker files, notably the fonts and graphics used in them, but it didn't let you print or save that information—just view it on screen.

CheckList 2.0 has the ability to print and save CheckList reports, plus many new features. Most important are the program's system-wide font-searching capability and the ability to look at a variety of PostScript files to determine what fonts and EPS graphics they include. CheckList isn't just for PageMaker users anymore.

The heart of CheckList is its ability to search for fonts. It can search the System file and any font suitcase you have open, search all disks with open suitcases, and even check the fonts available on a printer. CheckList then informs you of any font name and font ID conflicts, and suggests solutions.

CheckList works best with PageMaker

files. One screen lists the fonts used in a publication, where they are first used, and problems with them. CheckList even looks in the file's current APD (Aldus Printer Description) file to see what fonts are available on the target printer. The printed font report tells you if the font is used in text, in an EPS graphic, or in a PICT graphic.

Another screen (with its printed report) lists linked text and graphics in a document, whether the linked files are available, and the status of the copies (has the linked file been updated?). CheckList's Print Options window allows you to view and change all of PageMaker's print settings.

Perhaps the best new feature of CheckList 2.0 is its hierarchical display of PageMaker styles. If one style is based on another, the *child* style is displayed indented below the *parent* style.

CheckList now scans PostScript files from almost all Mac applications and from several PC applications (but not from Ventura Publisher). It lists the graphics and fonts included in the file, and warns you of font problems (fonts that you need to download, fonts not supplied or available, and bitmapped fonts).

CheckList 2.0 can also download PostScript files to a printer, and CheckList can automatically download needed fonts, in addition to adding the essential *showpage* operator to the end of EPS files.

You can add notes to a PageMaker or PostScript file (only other CheckList users can read the notes). And you can compress a PageMaker or PostScript file (even across multiple disks) with all the associated fonts, graphics, and ancillary files into a self-extracting bundle that can be decompressed by double-clicking on the file's icon.

CheckList 2.0 is not perfect. A couple of bugs have turned up—failure to find certain kinds of fonts, and memory problems (resulting in crashes) when there are too many fonts. The tabs entered in the saved-to-disk style reports make it difficult to line up the columns. You can scan only one file per window (though you can have multiple windows); you can't scan several files and report on all of them. And CheckList won't scan QuarkXPress, FreeHand, and other applications' files unless they are saved as EPS files. Version 2.01 deals with the obvious bugs (finding fonts and crashing), but for the rest, we will have to wait for the next release.

Even though CheckList is a bit overpriced, if you send PostScript or PageMaker files to a service bureau more than a dozen times a year, it's worth considering. If you work with a service bureau a couple of times a month, you'll probably recoup the program's cost in less than a year—and if you work for a service bureau, you need it now.—STEVE ROTH

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Educational Game

OutNumbered 1.0

PROS: Customizable problems; good graphics. **CONS:** Game and math challenges are repetitious. **COMPANY:** The Learning Company (510/792-2101). **REQUIRES:** Mac Plus; hard drive; System 6.0.2; Mac II, System 6.0.5, 2MB of RAM for color. **LIST PRICE:** \$59.95.

THE BEST LEARNING GAMES ARE good games wrapped around good curricula. The best example is *Where in the World Is Carmen Sandiego?* from Broderbund, with play good enough to capture adults while painlessly teaching geography and how to use a world almanac. *OutNumbered*, a decent enough math program, is in some ways reminiscent of *Carmen*, but falls short of the standard.

OutNumbered's story is that a local television station has been taken over by the maniacal Master of Mischief (M of M). While it's unclear why this is a problem, the player has from 9 p.m. until midnight to track the M of M to his lair—one of the five rooms in the station. You must find him before he changes all the shows to boring programs. Along the way, you get bushwhacked by Telly, a TV-headed robot, and electroshocked by the eponymous Live-

Wire. To have to solve math problems as well is almost adding insult to injury.

The graphics are attractive. The player is represented by a cool preteen in a jacket with a turned-up collar, yellow jams, and red high-top sneakers. He carries a handy zapper, a weapon that looks something like a TV remote control with an antenna. Successfully getting through the math problems (the number and difficulty of the problems depend on your rank of play) in one room nets you one part of a four-part code that eventually leads you to the M of M. Correctly identify his hideout, and the M of M gives up so easily it seems a shame to zap him. You get bonus points for remaining time and energy, and the on-screen hero celebrates your victory with a funky little dance and a couple of flips.

The game aspects of *OutNumbered* are good but somewhat limited. You can quickly go through all the rooms, and once you've solved the problem(s) in a particular room, there's no reason to go back to it. Some of the logistical aspects can be a little awkward. You can maneuver the game character equally well with the arrow keys or the mouse. However, you must keep an eye on the direction arrow in front of your on-screen alter ego or you might find yourself marching back into an elevator you've just left, or flipping over something you meant to walk into.

The math problems are the least impressive part of the program. They are also repetitious: in one game I played the same challenge problem in the same room three times in a row. And a few word problems are worded obscurely enough to stump adults. One useful feature is that you can solve the math challenges by using the on-screen calculator, the standard numeric keys, or the keypad on an extended keyboard.

The program was originally targeted for students ages 7 through 14, but even in customized play, using all the mathematical options, the problems are much too easy. (You customize problems and drills by specifying which mathematical operators—addition, subtraction, multiplication, and division—to use, as well as the range of numbers.) The program is now recommended for the 7-to-10-year-old age group—a much better choice.

On the whole, I recommend *OutNumbered* as an alternative to pen, paper, and rote memorization to teach basic math skills. The program will probably be most effective with the bottom to middle of the targeted age range—grammar school, rather than middle school, students. The customizing options and Drill for Skill features make it possible for teachers to tailor the game to their students' needs, and School and Lab editions are available for classroom use. —LOUISE KOHL

Format-Translation Utility

EPS Exchange 1.01

PROS: Simple installation and interface; saves Aldus FreeHand illustrations in Adobe Illustrator 3.0 and Illustrator 88 formats. **CONS:** Does not export EPS headers; does not enhance FreeHand's ability to open Illustrator files; overpriced. **COMPANY:** Altsys Corporation (214/680-2060). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; Aldus FreeHand 3.0. **LIST PRICE:** \$150.

DESPITE THE ALLEGIANCE AN artist might have to a draw program, most artists acquire all the draw programs they can. For example, Adobe estimates that 70 percent of Illustrator users also use Aldus FreeHand. Though FreeHand has long been able to open Illustrator 1.1 files, it isn't equipped to open an Illustrator 88 or 3.0 file, and Illustrator doesn't know a FreeHand document from an empty disk sector.

EPS Exchange permits users of FreeHand 3.0 to save an illustration in the Illustrator 3.0 or Illustrator 88 format. Copying EPS Exchange to the Aldus folder inside the System Folder automatically appends two new options, Adobe Illustrator 3.0 and Adobe Illustrator 88, to each of

FreeHand's Save and Export dialog boxes. If you're familiar with FreeHand, you know that the Export command is used exclusively to create encapsulated PostScript (EPS) files. You might, therefore, expect these new options in the Export dialog box to create Illustrator documents with EPS headers. Alas, this is not the case. Whether you use the Adobe Illustrator 3.0 option in the Save dialog box or the one in the Export dialog box, you get the same result: an Illustrator 3.0 document with no EPS preview. In other words, EPS Exchange doesn't have anything to do with EPS.

That said, EPS Exchange translates FreeHand files to the Illustrator format with a high success rate. To test the utility, I created five types of objects that are handled differently inside FreeHand and Illustrator: stroked text, text that has been converted to editable paths, a linear gradation, a radial gradation, and text on an ellipse. For good measure, I threw in a few

process and Pantone colors. All successfully converted to their nearest Illustrator equivalents, except the Pantone color, which was separated into process colors. And because Illustrator 88 does not support composite paths (shapes with holes cut out of them), the letters with hollow interiors filled in when translated to the Illustrator 88 format. Otherwise, the translations worked beautifully. The stroked text converted to a standard text block inside a rectangular boundary. The gradations converted to blended objects masked by rectangles. The text on an ellipse converted to individual letters skewed at specific angles.

EPS Exchange might not do everything you want it to do, but it does successfully translate FreeHand documents to the Illustrator format. Still, at \$150, this 44K extension file seems outrageously overpriced. At last count, the \$600 FreeHand 3.0 offered well over 300 functions; that's \$2 per function at most. EPS Exchange boosts

FreeHand's function list by two, which comes to \$75 per function. Altsys promises that other expansion utilities are on the way, including an Illustrator-to-FreeHand translator. You might want to wait and see if Altsys plans to bundle these utilities at a lower price.

—DEKE MCCLELLAND



Successful Translations A FreeHand gradient (top) and the same gradient as it appears printed from Illustrator 3.0 (bottom) after being converted using EPS Exchange.

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Take Your Best Shot

BY DAVID POGUE

IN THE EARLY DAYS, IT WAS ONE of those hidden surprises built into the Mac by crafty Apple engineers: if you pressed a secret combination of keys, you could take a snapshot of whatever was on the screen. Curious, you'd try this so-called F-key, ⌘-shift-3, and sure enough, a MacPaint document called Screen 0 suddenly appeared on your disk. You'd just witnessed the birth of a *screen dump*, or more pleasantly, a *screen shot*. Documentation writers, trainers, and magazine authors rejoiced; screen shots aplenty began to appear in ads, manuals, and *Macworld*.

But time and change humble even the greatest F-keys, and soon Mac owners discovered that the magic keystroke didn't work in color. Or on big screens. Or across multiple monitors. Furthermore, writers and tech-types tired of launching MacPaint to erase 90 percent of that Screen 0 document just to isolate the one dialog box, menu, or icon they were trying to capture. A market niche was born: screen-capture software.

System 7

WELL, OK, TECHNICALLY, APPLE'S SYSTEM 7 (\$99) isn't a screen-capture utility. Yet it does give new life to Apple's charming built-in screen shot function. Instead of the limited 8-by-10, black-and-white MacPaint format, the new, improved ⌘-shift-3 feature generates full-color, full-size, right-side-up PICT files. And it even makes a satisfying cameraesque *kachunk* sound. Try it!

Still, ⌘-shift-3 only satisfies some of the people some of the time. You still need a graphics program to edit the results; you still have to erase unwanted parts of the image; and you still can't use the key combination when a menu is pulled down. But it'll do if you're ever stranded on a desert island with nothing but a Mac and a power outlet.

Capture 4.0

THIS CONTROL PANEL FROM MAINSTAY (\$129.95) established the conceptual model that all rivals would later follow: when you press the magic key combination, you *don't* actually create the snapshot. Instead, you get a crosshair cursor, which you can drag over any rectangular

portion of the screen. Only when you release the mouse button is your selection saved. In other words, much of the post-snapshot editing work is eliminated—in essence, you crop the shot as you take it. And you can grab pulled-down menus this way, too.

Instead of just dumping a graphics file onto a disk, Capture can also place the screen shot on the Clipboard, send it to the printer, or place it neatly in the Scrapbook without even opening it. That last idea is a gem—you can race uninterrupted through your software like a Grand Canyon tourist, snapping madly away, while the program files everything neatly in the Scrapbook behind the scenes. And Capture is the only screen grabber decent enough to display a message (if you want) letting you know that all went well.

Good as it is, though, technology has left Capture behind in several ways. First, \$129.95 is way too much to pay for such a one-trick pony. Worse, Capture's interface, though attractive, is a control panel. Every time you want to change one of its settings, you have to open Capture's control panel—which, particularly in System 7, is slower than frozen ketchup running uphill.

Screenshot 1.2.0

LEAVE IT TO 20-YEAR-OLD PROGRAMMER Mike Whittingham to come up with a better solution (Baseline Publishing, \$59.95). This time, a floating minipalette appears when you press the trigger keys—no overnight Control Panel stay required. Using a pop-up menu, you tell your screen shot where to go: to the Clipboard, Printer, or Scrapbook, or to a disk as a PICT, Paint, or Startup Screen file. Savor the checkbox options, modeled on those of Capture: Show Cursor, Color to B&W, Change Size (of the resulting image), and so on.

Finally, you click on one of the four fat buttons—Screen, Window, Menu, or Selection—to tell Screenshot what to grab. Soon enough, you'll be paying homage on

bent knee to those canned choices—especially Menu and Window, both of which neatly eliminate the rest of the screen from the screen shot, isolating the active menu (or window) and saving you a trip to MacPaint for an erasing session. The Menu capture button can also grab pop-up menus, hierarchical submenus, and even sub-submenus.

The little touches make Screenshot especially slick: it can either name a file automatically (Excel Shot 1, for example) or prompt you for a name and folder location. It can grab only the currently pulled-down menu or include the whole menu bar. The whole thing is as smooth as silk and beautifully designed.

Exposure Pro 1.0.2

HEY, LOOK—IT'S SCREENSHOT ON STEROIDS. Same author, same company (Baseline Publishing)—just four times bulkier (336K), twice as expensive (\$139.95), and a hundred times more feature-laden. The gimmick here is that when you hit the shutter keys, the entire screen freezes into a gigantic painting, and the Exposure floating palette is your editing kit. In other words, you get to touch up the screen shot *before* it ever gets saved. You'll be weirded out the first time you grab the eraser tool and start wiping out strips of your spreadsheet. (Don't you sometimes wish spreadsheets really had an eraser tool?)

The features are pretty glamorous: a selection of cursors you can rubber-stamp onto the frozen screen image (since the real cursor does not appear); a serrated selection tool for giving truncated menus a torn-off look; a frame tool to put a neat border around the image; and text, line, and arrow tools for adding captions and call-out arrows to an image (see "Overexposed").

Sadly, most of these features fall short in the real professional world, because everything Exposure creates is a 72-dots-per-inch bitmap; the arrowheads, text captions, borders, and serrated menu

continues



*Capturing
your favorite
on-screen
moments
with screen
grabbers*

lines show jaggies if laser printed or published. Exposure is a clever idea for people who don't already own a paint program for doing touch-ups; but the interface is somewhat confused, and the whole affair is a tad bloated.

Snippet

THE YOUNG SHALL INHERIT THE MARKET: 21-year-old shareware guru Andrew Welch wrote Snippet, part of QuickTools 1.0 (Advanced Software, \$79.95). In features and look-and-feel, Snippet and Screenshot (for description, see "Screenshot" above) are practically identical. (Apparently the cross-pollination took place at Preferred Publishers, where the programs' development paths overlapped at one time or another.)

Snippet, at 58K, is slightly more compact than Screenshot, and comes as part of an eight-utility set... so toss a coin or decide whether the remaining seven QuickTools are worth the \$30 price difference.

PICTuresque 1.7

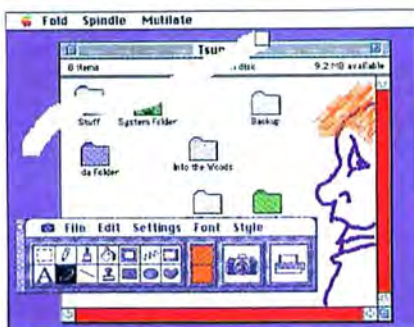
THIS PROGRAM HAS NO BUSINESS BEING here, since it is not a screen-capture program. But I found it on America Online one night, and it's super-useful. I thought maybe I'd slip it in and hope the editors wouldn't notice.

Well, it *sort of* fits the category. It's a no-frills shareware desk accessory (\$20) by 23-year-old Tim Herzog. (I don't get it. Do you have to be under 25 to write these things?) It converts encapsulated PostScript (EPS) files into a format you can paste into Word, WriteNow, or other normally EPS-hostile programs, without sacrificing any of their high-res PostScript-ness. Bet you didn't think you could do that. And hey, if you can paste EPS files into any word processor, who needs PageMaker, right?

Flash-It 2.2

HERE'S A SHAREWARE GEM THAT DOES almost everything the commercial screen grabbers do—it just doesn't look as good doing it (\$15, Nobu Toge). The interface gets a little tricky, but has advantages: using the Control Panel, you assign a *different* keystroke to each option (Send to Scrapbook, Send to Printer, and so on). There's also a separate "decide on the fly" keystroke that produces a dialog box *after* you grab an image, letting you specify the screen shot's destination.

True, Flash-It lacks that capture-just-the-menu feature that Screenshot, Snippet, and Exposure have. But you still get to send any image to the Scrapbook, Clipboard, printer, or disk file. And you even get to tell the program what *kind of*



Overexposed Exposure Pro contains a built-in paint program, so you can doctor your screen shot before you consign it to the Clipboard (or a disk file, or the Scrapbook, or the printer). You might have to avoid the temptation to go a little crazy.

disk file to create: a Canvas document, MacDraw Pro, or whatever. (Snippet does that too.) You have to study the thing for a few minutes to understand how it works—but heavens, it's only 15 bucks.

Image Grabber 2.0

CONTORTING YOUR FINGERS TO HIT \mathbb{A} -shift-whatever isn't an especially Mac-like way of making something happen. Maybe that's why Image Grabber, the only desk accessory screen capturer, feels friendlier than its F-keyed-up rivals (Sabastian Software, \$49). It couldn't be simpler: choose Image Grabber from the Apple menu, then drag the crosshairs across the region you want captured.

Of course, that scheme means you can't capture a pulled-down menu (think about it). In that instance, you can use the Timed Grab option, which gives you, say, ten seconds to get your screen the way you want it before the shutter goes off. (Remember the old Camera DA? Doesn't work anymore, but it's the same idea.) But using the Timed Grab, you can't specify what part of the screen you want. Rats. (Version 3.0, they say, will address this inconvenient arrangement.)

Snap 2.1

ANOTHER ICONOCLASTIC APPROACH: a screen grabber as an application. This polished, ingenious piece of shareware (Knowledge Source, \$17) requires MultiFinder or System 7. Choose New from the menu, and the now-familiar crosshair cursor appears; as usual, you drag-enclose the part of the screen you want.

What's *not* usual is what happens next: the screen fragment you enclose sits exactly where it was before, but now it's in a window. You can move it, print it, save it as a PICT file, or just leave it floating there for reference. You can generate scads of these image windows, just hanging open on your screen. So Snap is perfect if, say, you need to refer

to an image from one program while you write about it in another.

Otherwise, Snap isn't terribly flexible. Because it's an application, it can't shoot menus, dialog boxes, or other programs' menu bars—a whopping drawback. Why doesn't somebody come up with an F-key—or DA-based—capturer that can leave screen shots on the screen? Read on.

SnapJot 3.01

SNAPJOT IS AN F-KEY- AND DESK ACCESSORY-based capturer that can leave your screen shots on the screen. (*Et voilà.*)

You press a key combination to produce the crosshair cursor, which you drag across the screen. What's nice is that, as with the shareware Snap, SnapJot (Wildflower Software, \$59.95) leaves screen shots in individual windows. But what's even nicer is that the key combination lets you shoot menus, dialog boxes, and other programs. In fact, like Flash-It, SnapJot lets you specify a different trigger-key combo for each function: save to disk, copy to Clipboard, or print.

Half of SnapJot is a desk accessory, which you open to change your settings. The DA still isn't as convenient as a palette that pops up at the moment of truth, but it's sure faster than opening the control panel. It can also make life confusing when you have the leave-the-screen-shot-in-its-own-window option turned on, because when you use the key combination to take a shot, the DA automatically opens too, without any warning. And that can freak out the real program you're using, in which case nothing works right. (The DA might freak *you* out at first, too: it has no Close or Quit command. Eventually it dawns on you to close all the little floating windows to exit the program.)

SnapJot has none of the elegant niceties of the floating-palette programs, either, such as the one-click menu or the window-grabbing features, or the send-to-Scrapbook option. But *mmm*, boy, that leave-the-shot-in-a-window feature sure is slick.

The Upshot

FOR VALUE, TIME SAVINGS, FLEXIBILITY, surefiredness, and elegance, Screenshot takes the cake. That means its clone, Snippet, does too. If you'd rather trade the one-click menu-grab feature for the ability to leave your shots on the screen for reference, then snap up SnapJot. And start saving those cherished on-screen memories for future generations. **m**

Contributing editor and software-manual writer DAVID POGUE ran out of available function-key combinations in early 1988.

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* Not compatible with Macintosh 128K or 512K machines.

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New Products

The Latest Macintosh Releases

EDITED BY EVAN COOPER

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY MACWORLD. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

'030 Classic Video Board

Provides 8-bit video output for Classic II's, allowing them to drive VGA or Apple 13" RGB monitor. \$699. Lifetime Memory Products, 714/969-2421, 800/233-6233.

6c OmniMedia

Flatbed 24-bit color and gray-scale scanner that scans transparent or re-



6c OmniMedia

flective materials; backlighting arm moves with scan head to control light behind image. Supports resolutions up to 600 dpi. Ships with Adobe Photoshop. 2MB of RAM required in 24-bit mode. \$3500. XRS, 213/214-1900.

BookView Imperial

Allows Macintosh PowerBooks to connect to VGA, Apple, and NTSC monitors, and overhead projectors via an external video adapter. Plugs onto the internal system

board and adds 4MB of DRAM. Model for PowerBook 140 and 170 supports color and gray-scale devices; version for PowerBook 100 drives only monochrome devices. Includes cable for connection to VGA monitors; other cables may be purchased separately. PowerBook 140 model and 170 model \$1189; PowerBook 100 model \$959. Computer Care, 612/371-0061, 800/950-2273.

BP3670

Bubble-jet printer that produces A-, B-, and C-size output at 180 or 360 dpi. Prints six letter-size pages per minute at 180 dpi. Based on Canon bubble-jet engine. \$1995. Bézier, 408/345-0345.

Comstation Four

Hayes-compatible 9600-bps facsimile and 2400-bps data modem connects to an Ethernet or AppleTalk network to allow data or fax transmissions from any computer on a network. The incoming faxes are received in background and can be printed from server or distributed via E-mail. Software lets user customize cover sheets, store transmission log files and phone directories, schedule future transmissions, and automatically redial phone numbers. Complies with Fax Group 3 standards. \$699. PSI Integration, 408/559-8544, 800/622-1722.

EtherFlex

Interface board for Hewlett-Packard LaserJet se-

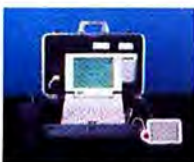


EtherFlex

ries II, IID, III, and IIID printers; board allows direct connection to Apple EtherTalk or Novell NetWare local area networks. User sets switch on board before installation to determine protocol. Installs in printer's I/O slot and supports 10Base2 and 10BaseT Ethernet connectors. Protocol module can be upgraded to support other network protocols. \$695. Extended Systems, 208/322-7575, 800/235-7576.

Executive Portable Office

System is packaged in shock-resistant, Halibuton case; system includes a 68030-based Out-



Executive Portable Office

bound notebook computer, a Macintosh Portable, or a PowerBook 140; a Kodak portable printer; a send-and-receive fax modem; cellular phone and antenna; and optional full-page portable scanner. Outbound notebook features 60MB hard drive, 4MB of RAM, and 3.5-inch SuperDrive. Standard system weighs less than 18 lbs. \$7950; with scanner \$8990. Computers Plus, 813/277-0063.

Infolio

Pen-based computer designed to serve as electronic clipboard used to gather data for various vertical markets. Provides data-transfer framework that allows data sharing with Macintoshes, DOS PCs, and minicomputers. Main processor is a Motorola 68331 32-bit



Infolio

small systems processor. Core software kernel modules and applications reside in 1MB of ROM; computer has 1MB of RAM on PCMCIA boards and slots for up to three SRAM or ROM removable memory boards. Uses 8 AA-size rechargeable batteries for 12 hours of battery life. Uses Sharp LCD screen, available in backlit and nonbacklit versions. Company says will be priced at less than \$2000. PI Systems, 503/293-9585.

LabelEase

Produces thermal-transfer labels. Accepts graphic elements imported from the Clipboard. Software can add static text, text fields, and bar codes. Package includes Monarch 9401 or 9446 print-



LabelEase

er, with maximum label sizes of 2 inches by 9 inches and 4 inches by 9 inches, respectively. Can rotate labels and bar codes and generate summary reports of printing usage. 2MB min. memory. LabelEase-9401 \$4995; LabelEase-9446 \$5495; software only \$2995. Irie Computer, 313/665-5115.

MacWatt

NuBus accelerator board for the Macintosh II family based on an Intel i860 processor that increases floating-point capacity. Available with clock speeds of 25MHz, 33MHz, and 40MHz. Peak performance is over 80 MFLOPS, company claims. Board uses dedicated communications processor to control NuBus I/O. can carry up to 16MB of DRAM, and has expansion slots for additional processors or special I/O and graphics module. Developers must write driver to take advantage of the MacWatt's speed. 25MHz with 4MB of DRAM \$6100; 40MHz with 16MB of DRAM \$10,400. Division Limited, Quarry Rd., Chipping Sodbury, Bristol, United Kingdom, BS17 6AX.

MagicNet

Local area network hub that operates at 10Mbps per second and supports any device with Ethernet board. Hubs are available in four- and eight-port configurations; each hub supports up to 30 devices. Network devices are daisy-chained using thin coaxial cable and are connected to Assistant Network Manager, a device that connects to a hub using voice-grade telephone wire. Managers can be located up to 400 feet from hub. Four-port hub \$475; eight-port hub \$895; Assistant Network Manager \$99. Tutankhamon Electronics, 510/682-6510.



MagicNet

MicroMac Plus Upgrade System

Adds support for large-screen displays, SCSI connection for internal hard drive, and integrated expansion slot. Modular enclosure includes fan-cooled, autoswitching power supply and company's ZeroSlot video board; optional internal hard drives available. Installation manual guides buyer through repackaging process, or company will repack for \$50. \$725; with a 14-inch VGA monochrome monitor \$895; with a 15-inch monochrome monitor \$995. MicroMac Technology, 714/363-9915.



MicroMac Plus Upgrade System

Notebook Video Board

Family of boards for Macintosh PowerBooks that provide monochrome output for the 100 and 8-bit video output for the 140 and 170. Boards can drive Apple 13" RGB monitor, VGA monitor, or LCD overhead projector, and can have 2MB of video RAM. Model for 100 has 2MB of DRAM; model for 140 and 170 has 4MB of DRAM. \$699. Lifetime Memory Products, 714/969-2421, 800/233-6233.

OptiStor 650

Rewritable magneto-optical disk subsystem with storage capacity of 650MB per removable continues

cartridge. SCSI device uses Sony drive system, and has data-transfer rate of 900K per second with burst rate of 1.2MB per second. Requires company's \$95 software adapter kit for use with Mac. \$4180. Unbound, 714/843-1895, 800/862-6863.

Optoscan Integral Pro

Autofocus overhead 24-bit color/gray-scale scanner with up to 5000 by 7200 resolution and built-in light table. Scans 3-D objects and reflective and transparent documents. Ships with SpectreDriver, SpectreScan, and SpectrePrint Pro software. Scanner can convert RGB scan to CYMK on the fly. \$33,990. Pre-Press Technologies, 619/931-2695.

Pocket Fax Modem

A 6-ounce fax modem that sends and receives data and faxes at 9600 bps and supports V.42bis data compression and V.42 error correction. Powered by 9-volt battery or AC adapter. Includes QuickLink II for Mac



Pocket Fax Modem

software. \$399. MiCC, 408/980-9565.

PowerMemory

Family of expandable RAM boards that can increase total memory to 8MB on Macintosh PowerBooks. Available in 2MB fixed RAM and 2MB or 4MB flexible RAM configurations. Flexible RAM boards have additional socket to which any fixed RAM board can be added. 2MB fixed RAM \$399; 2MB flexible RAM \$499; 4MB flexible RAM \$999. PSI Integration, 408/559-8544, 800/622-1722.

QBlazer

A transportable V.32, 38,400-bps modem with V.42 error correction and V.42bis data compression. 2.3-by-2.4-by-2.4-inch modem operates

using 9-volt battery or AC adapter. Includes coupon to purchase MicroPhone II for \$99. \$745. Telebit Corp., 408/734-4333, 800/835-3248.



QBlazer

QuadFlextra

Very high density floppy (VHDF) subsystem; reads and writes 21.4MB disks; offers an average seek time of 35ms and an average data-transfer rate of 1.25MB per second. External SCSI drive uses the company's Twin Tier Tracking system to ensure data integrity. Disks under lifetime warranty. Exter-



QuadFlextra

nal drive and four disks \$895; additional disks \$25 each. Quadram, 404/932-6666.

QX/4232bis

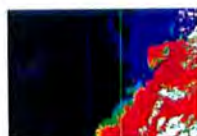
Modem using MNP Class 10 error-correction and V.32bis standard enabling modulation up to 14,400 bps. Effective throughput is 38,400 bps using V.42bis data compression. \$999. Microcom, 617/551-1000, 800/822-8224.



QX/4232bis

SatView

System that allows Macintoshes to receive real-time weather and surface-temperature images from polar-orbiting weather satellites. Package consists of Mac-controlled wideband radio receiver, SatView software, and



SatView

NuBus board. Software controls receiver, and stores and manipulates received images that may be saved as PICT files. Anyone with system can access data from satellites free of charge. Requires Mac II, 2MB min. memory. \$3950. Marisys, 407/272-3490.

Spectra Star 440

A thermal-wax transfer color printer that includes internal 32MB hard drive for print spooling and font storage. PostScript-compatible printer offers resolution of 300 dpi. Higher-capacity drives also available on special order. \$7995. General Parametrics, 510/524-3950.

Studio 5

MIDI interface, processor, synchronizer, and patch bay with microprocessor; provides RAM storage for

up to 128 patches. Lets computer communicate independently with 15 MIDI ins and outs; adds filtering, channelization, and note-range splitting; converts SMPTE time code into MIDI time code; and reads and writes SMPTE time code in all formats. Supports 240 MIDI channels and can create unlimited number of virtual instruments. Bundled with Opcode MIDI System plus software for studio integration. 1MB min. memory. \$1295. Opcode Systems, 415/369-8131.

Tefax RA2136

Fax machine that acts as a Macintosh peripheral device and has automatic paper cutter. Device's telephone/fax switch recognizes incoming faxes and phone calls and routes them to Tefax, phone, or answering machine (not included). Faxes can be printed on Tefax, saved to a hard drive, or both. Transmits at up to 9600 bps; also operates as 200-dpi scanner with AutoFax software. Soft-

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ware allows user to edit received faxes, schedule transmissions, and automatically generate fax cover page. \$1495. Relisys, 408/945-9000.

SOFTWARE

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Two collections of animations in PICS format for corporate presentations; clips feature business objects and metaphors that can be customized. Images support any multimedia authoring package that can import PICS files. Each volume contains 30 animations in black-and-white line art or 8-bit color; optional sound file available with each animation. Min. memory depends on



Animation Clips: Business Volumes I & II

authoring package used. \$99 to \$149, depending on options. Media In Motion, 415/621-0707, 800/395-2547.

AutoDoubler

Performs file compression automatically and transparently, and can access files and run applications that are in compressed format. User specifies percentage of disk space needed available at any given time, and program automatically compresses files of user-specified age when computer is idle. Fault-tolerant compression technology aids utility in localizing and repairing damaged data in the event of disk crash. Icons of compressed files can be marked for visual identification. 1MB min. memory. \$79.95. Salient Software, 415/321-5375.

Corporate Intelligence

Electronic news-retrieval system that gathers data from CitiCorp's Global Reports news service and stores information in a networked database. Updates business

data on user-defined schedule. Database contains company profiles, industry news, general business news, and stock market exchange summaries. 1MB min. memory. Ten-user pack \$2500; additional users \$75 each. MediaWorks, 408/356-0620.

DataClub Elite

File-server software that supports more than 200 users and can combine multiple dedicated servers to appear as one server on client desktops. Offloads all Finder operations to client workstation to increase speed. Supports mixed environment of machines operating on System 6.X and System 7. 4MB min. memory. \$1395. International Business Software, 408/522-8000, 800/733-2822.

designPower

Application for use with Claris CAD that has parametric, or what-if design tools, allowing user to manipulate the shape, dimensions, and action of an existing

model. Other features include relational layers, object linking, and animation and simulation capabilities. Program's Geometric Resolver insures that designs conform to user's specifications. Package includes library of parametric symbols of doors and windows for use in architectural design. Also supports MacDraw II, MacDraw Pro, and DFX. 2MB min. memory. \$399. Vision Software, 408/748-8411, 800/800-8476.

Expanded Books

Collection of books on disk designed to be read on Macintosh PowerBooks. Instead of scrolling, user clicks on buttons to navigate pages, which can be searched and marked. Sizable margins provide space for note taking. First three titles to be released are *The Complete Hitchhiker's Guide to the Galaxy*, by Douglas Adams, *Jurassic Park*, by Michael Crichton, and *Martin Gardner's The Annotated Alice* and *The More Annotated Alice*. Company plans to

release new titles each month. 1MB min. memory. \$19.95 each. The Voyager Company, 213/451-1383.

FrameReader

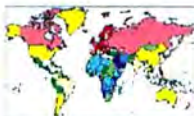
Software that allows user to print, read, and distribute FrameMaker documents on Unix and Mac platforms. Includes navigation tools for use with hypertext created in FrameMaker and has multiple zoom levels. Creates links to files for instantly updated images. 1MB min. memory. \$125. Frame Technology, 408/433-3311.

LinksWare

Creates permanent links to text and graphics files using standard document types such as Microsoft Word, WriteNow, and RTF. User double-clicks on a selected word or graphic and then opens the file to be linked to create document for use with run-time version of program. 2MB min. memory. \$189. LinksWare Corporation, 408/626-4177; 800/879-5465, orders only.

MacGlobe

Electronic atlas of the world with profiles of 190 countries and dependencies. The atlas includes maps, graphics, and data for each country; data can be compared using bar charts or thematic maps. Maps and graphics can be exported as PICT files. Shows flags and plays national anthems. Updates of data available annually. 1MB min. memory. \$79.95. PC Globe, 602/730-9000, 800/255-2789.



MacGlobe

MacMICA

A real-time interactive conferencing application for use over AppleTalk networks. Allows users to annotate and highlight visual information using shared conference window. Program includes file-transfer mechanism and folders for file storage; uses Finder's Clip-continues

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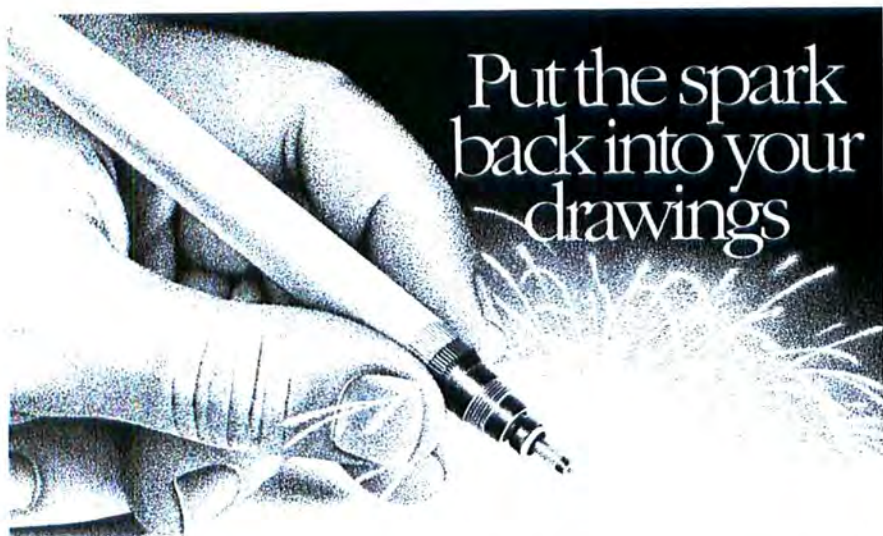
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board to move images from other applications into conference window. 1MB min. memory. Single license \$349; five-user license \$1030; ten-user license \$1490. IIS Technologies, 416/890-2773, 800/263-9673.

Monopoly for Mac

Computerized version of board game by Parker Brothers. Up to eight players, human or computer, move their game pieces around a color replica of a Monopoly board. 1MB min. memory. \$49.99. Virgin Games, 714/833-8710.

Photo Animator

Creates animations that can be played back in word processors, in HyperCard 2.0, and in the Scrapbook. Storyboard layout shows full animation sequences. Animation frames are created using program's color paint tools. Floating palettes include a customizable color palette. Features multiple-level zooms and automatic scrolling. System 7-compatible. Requires Mac II and System 6.0.7. 1MB min. memory. \$179.95. Zeus Data Systems, 719/522-0649.

PlanMaker

Program that helps user prepare, formulate, and publish business plan for presentation when soliciting investment funds. Application is written in HyperCard and includes



PlanMaker

three complete business plans and several financial forecasts to study. Various modules prompt user for information necessary to complete plan. Plan may include up to ten sections, including executive summary, pricing and market analysis. 2MB min. memory. \$129 plus \$3 s/h. PowerSolutions for Business, 314/421-0670, 800/955-3337.

Scrabble Deluxe

Computerized version of Scrabble board game that contains 100,000 Official Scrabble Players Dictionary within program. Players can enter new words and definitions in user dictionary. Game allows four human players; computerized opponent has nine skill levels. Black-and-white and color versions available. 2MB min. memory. \$49.99. Virgin Games, 714/833-8710.

Splat'ers

Three-dimensional action game that pits player against up to 15 computer opponents. Players are armed with pistols that fire balls of paint at opponents. Options include capture-the-flag-type games and strategy games. Must run in 16-bit color. Requires Mac II, 1MB min. memory. \$69.95. Bullseye Software, 702/831-2523.

Stuffit SpaceMaker

Control Panel device that automatically compresses any file on the fly or after user-defined idle time. User marks files for compression by adding preset keyword to file name. Can be operated from Finder or any application. Compressed file automatically expands when opened and recompresses when closed. 2MB min. memory. \$59.95. Aladdin Systems, 408/761-6200.

TrashMaster

Automatically empties files dragged to Trash under System 7. Adds menu to Finder's Empty Trash command that lists all files currently in the Trash. Can be scheduled to empty Trash at regular intervals or on user-specified system events. Incinerator function erases files when Trash is emptied and conforms to Department of Defense specifications. 1MB min. memory. \$59. The HandOff Corp., 214/727-2329.

CD ROMS

MaxImages A2

Collection of over 340MB of digital images for use in desktop publishing. Each image provided in 24-bit, 8-bit, and gray-continues

Dear Kate Letter

October 22, 1991

Dearest Ellen:

If there is anything better than being loved by you...it is loving you.

And you are so easy to love. You've brought such wonder into my life and have touched my heart with your love.

I just want you to know, my darling, that it feels so good being in love with you and I want to love you for a very long time.

You are a wonderful woman and I love you dearly. If I'm dreaming, please don't wake me up—I don't want this to end.

Monogamously yours,

1040

Departing U.S. In

For the or other Your

Chr If a jo

Label (See instructions on page 8.)

Use IRS label. Otherwise, please print or type.

President's Election Campaign (See page 9.)

Filing Status

Check only one box.

Exemptions (See instructions on page 10.)

PERSONAL

Normal

FROM: Scott (11/14/91)

TO: Chris

CC:

BCC:

Subject: **PERSONAL**

Time: 1:24 PM

Date: 11/14/91

OFFICE MEMO

During a recent dinner at Chairman Binkenhimer's home, you stated that members of the Daughters of the American Revolution are "a bunch of old battle-axes."

Judging from the fact that you made this comment within earshot of the Chairman, you must not be aware that Mrs. B. is a founding member of the local D.A.R. chapter and holds the rank of Brigadier General.

Employee Evaluation

During a recent dinner at Chairman Binkenhimer's home, you stated that members of the Daughters of the American Revolution are "a bunch of old battle-axes."

Judging from the fact that you made this comment within earshot of the Chairman, you must not be aware that Mrs. B. is a founding member of the local D.A.R. chapter and holds the rank of Brigadier General.

EMPLOYEE NAME	EMPLOYEE #	DEPARTMENT
ANTHONY HALSTEIN	223	Administration

PERFORMANCE OF RESPONSIBILITIES:

Mr. Halstein distinguished himself as a reliable administrator. But since Mr. Halstein's time position, this was considered unaccept-

INTRA-OFFICE RELATIONS:

Mr. Halstein distinguished himself as a reliable administrator. But since Mr. Halstein's time position, this was considered unaccept-

CHARACTER ISSUES:

Mr. Halstein distinguished himself as a reliable administrator. But since Mr. Halstein's time position, this was considered unaccept-

OTHER COMMENTS:

Mr. Halstein distinguished himself as a reliable administrator. But since Mr. Halstein's time position, this was considered unaccept-

RECOMMENDATIONS:

Mr. Halstein distinguished himself as a reliable administrator. But since Mr. Halstein's time position, this was considered unaccept-

RESUME

CHRISTOPHER S. KEENAN

CELEBRATE!

I got a new job.
LET'S PARTY!

Date: November 3

Time: 8PM

Place: Chris Place
123 Unemployment Lane
555-1212

RSVP

And remember, don't tell anyone else at the office!!!



Your Mac can say a lot about you.

If somebody sat down at your Mac and started snooping around your disk, which would embarrass you more?

The details of your love life? Your resume? Your adjusted gross income?

How about the Confidential Employee Evaluation you were working on when the Boss hauled you into his office for a chat?

What? You never thought about this before? Then read on and you'll never have to think about it again.

All you'll have to think about is your password.

That's the key to DiskLock™, the painless, yet powerful, System 7 savvy way to keep other people's noses permanently out of both your personal and professional data.

You can password-protect selected files, folders or your entire hard disk. And encrypt everything to U.S. Government DES specs.

You don't even have to be there. DiskLock blanks your screen and secures your system for you — without interrupting your applications — whenever you wander off.

When you return, it asks for your password and lets you know if anyone got curious while you were away.

If you're curious about DiskLock, or about our one-year money-back guarantee, call 1-800-477-8212.

We'll give you all the juicy details.



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Call	01/15/85	100	\$1.25	\$1.25	\$1.25	25%
Call	03/12/85	100	\$2.50	\$2.50	\$2.50	50%
Call	04/26/85	100	\$3.75	\$3.75	\$3.75	75%
Call	06/06/85	100	\$5.00	\$5.00	\$5.00	100%
Call	07/10/85	100	\$6.25	\$6.25	\$6.25	125%
Call	08/13/85	100	\$7.50	\$7.50	\$7.50	150%
Call	09/16/85	100	\$8.75	\$8.75	\$8.75	175%
Call	11/05/85	100	\$10.00	\$10.00	\$10.00	200%
Call	11/27/85	100	\$11.25	\$11.25	\$11.25	225%
Call	03/12/86	100	\$12.50	\$12.50	\$12.50	250%
Call	05/22/86	100	\$13.75	\$13.75	\$13.75	275%
Call	08/06/86	100	\$15.00	\$15.00	\$15.00	300%
Call	09/17/86	100	\$16.25	\$16.25	\$16.25	325%
Call	11/22/86	100	\$17.50	\$17.50	\$17.50	350%
Call	01/06/87	100	\$18.75	\$18.75	\$18.75	375%
Call	03/02/87	100	\$20.00	\$20.00	\$20.00	400%
Call	03/20/87	100	\$21.25	\$21.25	\$21.25	425%
Call	05/06/87	100	\$22.50	\$22.50	\$22.50	450%
Call	06/19/87	100	\$23.75	\$23.75	\$23.75	475%
Call	08/17/87	100	\$25.00	\$25.00	\$25.00	500%
Call	09/31/87	100	\$26.25	\$26.25	\$26.25	525%
Call	08/31/87	100	\$27.50	\$27.50	\$27.50	550%
Call	09/08/87	100	\$28.75	\$28.75	\$28.75	575%
Call	10/08/87	100	\$30.00	\$30.00	\$30.00	600%
Call	11/10/87	100	\$31.25	\$31.25	\$31.25	625%
Call	11/19/87	100	\$32.50	\$32.50	\$32.50	650%
Call	12/15/87	100	\$33.75	\$33.75	\$33.75	675%
Call	02/11/88	100	\$35.00	\$35.00	\$35.00	700%
Call	03/12/88	100	\$36.25	\$36.25	\$36.25	725%
Call	05/14/88	100	\$37.50	\$37.50	\$37.50	750%
Call	06/16/88	100	\$38.75	\$38.75	\$38.75	775%
Call	08/01/88	100	\$40.00	\$40.00	\$40.00	800%
Call	08/18/88	100	\$41.25	\$41.25	\$41.25	825%
Call	09/08/88	100	\$42.50	\$42.50	\$42.50	850%
Call	10/06/88	100	\$43.75	\$43.75	\$43.75	875%
Call	10/26/88	100	\$45.00	\$45.00	\$45.00	900%
Call	11/16/88	100	\$46.25	\$46.25	\$46.25	925%
Call	12/15/88	100	\$47.50	\$47.50	\$47.50	950%
Call	01/19/89	100	\$48.75	\$48.75	\$48.75	975%
Call	02/16/89	100	\$50.00	\$50.00	\$50.00	1000%
Call	03/12/89	100	\$51.25	\$51.25	\$51.25	1025%
Call	04/19/89	100	\$52.50	\$52.50	\$52.50	1050%
Call	05/18/89	100	\$53.75	\$53.75	\$53.75	1075%
Call	06/16/89	100	\$55.00	\$55.00	\$55.00	1100%
Call	07/16/89	100	\$56.25	\$56.25	\$56.25	1125%
Call	08/16/89	100	\$57.50	\$57.50	\$57.50	1150%
Call	09/16/89	100	\$58.75	\$58.75	\$58.75	1175%
Call	10/16/89	100	\$60.00	\$60.00	\$60.00	1200%
Call	11/16/89	100	\$61.25	\$61.25	\$61.25	1225%
Call	12/15/89	100	\$62.50	\$62.50	\$62.50	1250%
Call	01/15/90	100	\$63.75	\$63.75	\$63.75	1275%
Call	02/15/90	100	\$65.00	\$65.00	\$65.00	1300%
Call	03/15/90	100	\$66.25	\$66.25	\$66.25	1325%
Call	04/15/90	100	\$67.50	\$67.50	\$67.50	1350%
Call	05/15/90	100	\$68.75	\$68.75	\$68.75	1375%
Call	06/15/90	100	\$70.00	\$70.00	\$70.00	1400%
Call	07/15/90	100	\$71.25	\$71.25	\$71.25	1425%
Call	08/15/90	100	\$72.50	\$72.50	\$72.50	1450%
Call	09/15/90	100	\$73.75	\$73.75	\$73.75	1475%
Call	10/15/90	100	\$75.00	\$75.00	\$75.00	1500%
Call	11/15/90	100	\$76.25	\$76.25	\$76.25	1525%
Call	12/15/90	100	\$77.50	\$77.50	\$77.50	1550%
Call	01/15/91	100	\$78.75	\$78.75	\$78.75	1575%
Call	02/15/91	100	\$80.00	\$80.00	\$80.00	1600%
Call	03/15/91	100	\$81.25	\$81.25	\$81.25	1625%
Call	04/15/91	100	\$82.50	\$82.50	\$82.50	1650%
Call	05/15/91	100	\$83.75	\$83.75	\$83.75	1675%
Call	06/15/91	100	\$85.00	\$85.00	\$85.00	1700%
Call	07/15/91	100	\$86.25	\$86.25	\$86.25	1725%
Call	08/15/91	100	\$87.50	\$87.50	\$87.50	1750%
Call	09/15/91	100	\$88.75	\$88.75	\$88.75	1775%
Call	10/15/91	100	\$90.00	\$90.00	\$90.00	1800%
Call	11/15/91	100	\$91.25	\$91.25	\$91.25	1825%
Call	12/15/91	100	\$92.50	\$92.50	\$92.50	1850%
Call	01/15/92	100	\$93.75	\$93.75	\$93.75	1875%
Call	02/15/92	100	\$95.00	\$95.00	\$95.00	1900%
Call	03/15/92	100	\$96.25	\$96.25	\$96.25	1925%
Call	04/15/92	100	\$97.50	\$97.50	\$97.50	1950%
Call	05/15/92	100	\$98.75	\$98.75	\$98.75	1975%
Call	06/15/92	100	\$100.00	\$100.00	\$100.00	2000%
Call	07/15/92	100	\$101.25	\$101.25	\$101.25	2025%
Call	08/15/92	100	\$102.50	\$102.50	\$102.50	2050%
Call	09/15/92	100	\$103.75	\$103.75	\$103.75	2075%
Call	10/15/92	100	\$105.00	\$105.00	\$105.00	2100%
Call	11/15/92	100	\$106.25	\$106.25	\$106.25	2125%
Call	12/15/92	100	\$107.50	\$107.50	\$107.50	2150%
Call	01/15/93	100	\$108.75	\$108.75	\$108.75	2175%
Call	02/15/93	100	\$110.00	\$110.00	\$110.00	2200%
Call	03/15/93	100	\$111.25	\$111.25	\$111.25	2225%
Call	04/15/93	100	\$112.50	\$112.50	\$112.50	2250%
Call	05/15/93	100	\$113.75	\$113.75	\$113.75	2275%
Call	06/15/93	100	\$115.00	\$115.00	\$115.00	2300%
Call	07/15/93	100	\$116.25	\$116.25	\$116.25	2325%
Call	08/15/93	100	\$117.50	\$117.50	\$117.50	2350%
Call	09/15/93	100	\$118.75	\$118.75	\$118.75	2375%
Call	10/15/93	100	\$120.00	\$120.00	\$120.00	2400%
Call	11/15/93	100	\$121.25	\$121.25	\$121.25	2425%
Call	12/15/93	100	\$122.50	\$122.50	\$122.50	2450%
Call	01/15/94	100	\$123.75	\$123.75	\$123.75	2475%
Call	02/15/94	100	\$125.00	\$125.00	\$125.00	2500%
Call	03/15/94	100	\$126.25	\$126.25	\$126.25	2525%
Call	04/15/94	100	\$127.50	\$127.50	\$127.50	2550%
Call	05/15/94	100	\$128.75	\$128.75	\$128.75	2575%
Call	06/15/94	100	\$130.00	\$130.00	\$130.00	2600%
Call	07/15/94	100	\$131.25	\$131.25	\$131.25	2625%
Call	08/15/94	100	\$132.50	\$132.50	\$132.50	2650%
Call	09/15/94	100	\$133.75	\$133.75	\$133.75	2675%
Call	10/15/94	100	\$135.00	\$135.00	\$135.00	2700%
Call	11/15/94	100	\$136.25	\$136.25	\$136.25	2725%
Call	12/15/94	100	\$137.50	\$137.50	\$137.50	2750%
Call	01/15/95	100	\$138.75	\$138.75	\$138.75	2775%
Call	02/15/95	100	\$140.00	\$140.00	\$140.00	2800%
Call	03/15/95	100	\$141.25	\$141.25	\$141.25	2825%
Call	04/15/95	100	\$142.50	\$142.50	\$142.50	2850%
Call	05/15/95	100	\$143.75	\$143.75	\$143.75	2875%
Call	06/15/95	100	\$145.00	\$145.00	\$145.00	2900%
Call	07/15/95	100	\$146.25	\$146.25	\$146.25	2925%
Call	08/15/95	100	\$147.50	\$147.50	\$147.50	2950%
Call	09/15/95	100	\$148.75	\$148.75	\$148.75	2975%
Call	10/15/95	100	\$150.00	\$150.00	\$150.00	3000%
Call	11/15/95	100	\$151.25	\$151.25	\$151.25	3025%
Call	12/15/95	100	\$152.50	\$152.50	\$152.50	3050%
Call	01/15/96	100	\$153.75	\$153.75	\$153.75	3075%
Call	02/15/96	100	\$155.00	\$155.00	\$155.00	3100%
Call	03/15/96	100	\$156.25	\$156.25	\$156.25	3125%
Call	04/15/96	100	\$157.50	\$157.50	\$157.50	3150%
Call	05/15/96	100	\$158.75	\$158.75	\$158.75	3175%
Call	06/15/96	100	\$160.00	\$160.00	\$160.00	3200%
Call	07/15/96	100	\$161.25	\$161.25	\$161.25	3225%
Call	08/15/96	100	\$162.50	\$162.50	\$162.50	3250%
Call	09/15/96	100	\$163.75	\$163.75	\$163.75	3275%
Call	10/15/96	100	\$165.00	\$165.00	\$165.00	3300%
Call	11/15/96	100	\$166.25	\$166.25	\$166.25	3325%
Call	12/15/96	100	\$167.50	\$167.50	\$167.50	3350%
Call	01/15/97	100	\$168.75	\$168.75	\$168.75	3375%
Call	02/15/97	100	\$170.00	\$170.00	\$170.00	3400%
Call	03/15/97	100	\$171.25	\$171.25	\$171.25	3425%
Call	04/15/97	100	\$172.50	\$172.50	\$172.50	3450%
Call	05/15/97	100	\$173.75	\$173.75	\$173.75	3475%
Call	06/15/97	100	\$175.00	\$175.00	\$175.00	3500%
Call	07/15/97	100	\$176.25	\$176.25	\$176.25	3525%
Call	08/15/97	100	\$177.50	\$177.50	\$177.50	3550%
Call	09/15/97	100	\$178.75	\$178.75	\$178.75	3575%
Call	10/15/97	100	\$180.00	\$180.00	\$180.00	3600%
Call	11/15/97	100	\$181.25	\$181.25	\$181.25	3625%
Call	12/15/97	100	\$182.50	\$182.50	\$182.50	3650%
Call	01/15/98	100	\$183.75	\$183.75	\$183.75	3675%
Call	02/15/98	100	\$185.00	\$185.00	\$185.00	3700%
Call	03/15/98	100	\$186.25	\$186.25	\$186.25	3725%
Call	04/15/98	100	\$187.50	\$187.50	\$187.50	3750%
Call	05/15/98	100	\$188.75	\$188.75	\$188.75	3775%
Call	06/15/98	100	\$190.00	\$190.00	\$190.00	3800%
Call	07/15/98	100	\$191.25	\$191.25	\$191.25	3825%
Call	08/15/98	100	\$192.50	\$192.50	\$192.50	3850%
Call	09/15/98	100	\$193.75	\$193.75	\$193.75	3875%
Call	10/15/98	100	\$195.00	\$195.00	\$195.00	3900%
Call	11/15/98	100	\$196.25	\$196.25	\$196.25	3925%
Call	12/15/98	100	\$197.50	\$197.50	\$197.50	3950%
Call	01/15/99	100	\$198.75	\$198.75	\$198.75	3975%
Call	02/15/99	100	\$200.00	\$200.00	\$200.00	4000%
Call	03/15/99	100	\$201.25	\$201.25	\$201.25	4025%
Call	04/15/99	100	\$202.50	\$202.50	\$202.50	4050%
Call	05/15/99	100	\$203.75	\$203.75	\$203.75	4075%
Call	06/15/99	100	\$205.00	\$205.00	\$205.00	4100%
Call	07/15/99	100	\$206.25	\$206.25	\$206.25	4125%
Call	08/15/99	100	\$207.50	\$207.50	\$2	

Do You Make These Six Common Mistakes On Your Taxes?

Six common mistakes can cause you big headaches on your taxes. An oversight here, an omission there. From unnecessary tax payments to full blown IRS audits -- you can end up paying too much ... or worse.

But now, using MacInTax® and your personal computer, you can avoid these simple but costly mistakes:

1 The Arithmetic Error

Today, even the simplest forms contain complex calculations. And with all the late-night scrambling, an innocent mistake could cost you plenty.

2 The Transcription Error

With all those numbers being juggled from schedule to schedule, it's no wonder the figures are so often transcribed incorrectly or entered on the wrong line.

3 The Omitted Form

Even "ordinary" returns require anywhere from six to a dozen forms to complete. It's easy to miss one ... or end up rushing all over town to find the one you need.

4 The Misinterpreted Instruction

At best, IRS instructions can be tough to understand. At worst they can be mind-boggling. What you need are clear directions in plain English.

5 The Overlooked Deduction

You'd have to be a professional tax preparer to know all the deductions you're entitled to. If you miss just one, it could cost you hundreds of dollars.

6 The Exceeded Guideline

The fastest way to trigger an IRS audit is to exceed the "normal" range on one of your deductions. You need to know what the IRS looks for on a line-by-line basis.

When you do your taxes with MacInTax, mistakes like these are virtually impossible. And filing your taxes couldn't be easier.



America's #1 Tax Software

MacInTax is America's #1 best-selling Macintosh tax preparation software -- no others come close! With MacInTax on your Macintosh, you can completely and accurately prepare your income taxes in just a few hours.

Here's how easy it is!

- Gather your records and receipts.
- Enter your data into MacInTax just once.
- Print out, sign and drop in the mail.

MacInTax does the rest. MacInTax asks you step-by-step questions and shows you how to enter

every item. And like a good tax advisor, MacInTax helps you identify every deduction you can claim.

Then MacInTax makes all the calculations, checks for accuracy and consistency, and transfers every number to the proper lines on the proper forms. And, MacInTax prints every form you need in IRS-approved format right on your own printer -- ready to sign and mail (or file electronically, if you prefer, for a faster refund).

Macworld Magazine says "... the most successful special-purpose program yet for the Macintosh ..." Try it for yourself. Free. We know that if you try it, you'll never go back to doing your taxes the old-fashioned way again. So we'll send you MacInTax on an unconditional free trial basis: *If you don't like it, you don't pay for it!*

Free Bonus!

Plus, when you buy MacInTax, we'll send you a FREE copy of Norton Utilities as a special bonus gift. Norton Utilities (regular \$179) is America's best-selling disk repair and data recovery program. With over 40 different types of error checking, it performs the most extensive diagnosis and repair of any utility program for the Macintosh. And it's yours free when you buy MacInTax.



☐ Yes, I'll try MacInTax FREE!

Rush me a FREE trial copy of MacInTax ASAP (I pay just \$8.50 shipping now). I'll try it free for 30 days, and if I don't like it for any reason, I'll just send it back and owe nothing (shipping fee is non-refundable). If I do keep it, I'll be charged \$79.00 (\$20.00 off the regular price) after my 30-day free trial.

FREE BONUS: Your free copy of Norton Utilities (reg \$179) will be sent upon full payment.

Name _____
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Card # _____ Exp. Date _____
Signature _____

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Mail your order to: ChipSoft, Box 85709
Or Call NOW: San Diego, CA 92186-5709

800-487-8297 Ext. 755

MacInTax requires Macintosh Plus, System 4.2 or higher and hard drive. California residents please add 7.25% sales tax. Offer expires 4/15/92 -- not valid with any other offer. Offer also includes free HomeStart Edition for orders received through 12/31/91. MacInTax® is a registered trademark of ChipSoft CA, Corp.



Mass appeal.

If you find very high quality mass storage at very low prices to be very appealing, you've found the right ad.

Because that's what Ehman drives are all about.

All 35 of them.

Internal and external. Half height and full. Hard, floppy and tape. From 880K to 660MB.

Each drive is tested twice and subjected to a final 24-hour system burn-in. And each is filled with features you'd normally associate with hefty price tags.

Like whisper-quiet fans for unheard of noise levels. Dual-fuse

circuitry that gives you a second layer of protection from power surges. Fifty-pin cables for easier daisy-chaining. And access times as low as 10ms.

Our new 160MB tape drive can transfer an entire cassette worth of data in as little as 23 minutes.

Which makes it worthwhile for backing up hard disks.

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And the kind of technical support that generates stacks of mail from delighted customers.

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removable hard drive stacked second from the top is yours for the rock-bottom price of \$695.

While the very popular 45MB drive just below that is yours for a paltry \$299.

And that includes your choice of free software: *MacTree Plus* or *Disk Doubler*.

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Questions and Tips from Macworld Readers

BY LON POOLE

WHAT REALLY PREVENTS a Mac Plus, SE, or Classic from using System 7's virtual memory capability—the 68000 processor or the ROM? You may wonder after reading my response to "Memory Limits" in November's column. True, the 68000 lacks the memory-management unit needed for virtual memory, as Christopher Davis replied via Internet, but in the final analysis the ROM is the real culprit. You could upgrade a Plus, an SE, or a Classic by installing an accelerator containing a 68030, which includes a memory-management unit, but System 7's virtual memory still would not work.

Hidden Free Beep and Color Map

Like Michael Banks of Coppell, Texas, you may not have found the bonus beep sound and the color world map that a November tip promised would be in the System 7 Scrapbook. They exist in the Scrapbook file on Apple's System 7 distribution disks, but the Installer ignores that file if your System Folder already contains a Scrapbook file when you upgrade to System 7. To get at the sound and the map, temporarily move the Scrapbook file from your System Folder to the desktop. Next, copy the Scrapbook file from the System 7 distribution disk to your System Folder. Then open the Scrapbook, scroll to the sound, copy it, open the Sound control panel, and paste. Also, scroll in the Scrapbook to the color world map, copy it, open the Map control panel, and paste. Finally, select the Scrapbook file on the desktop, choose Put Away from the Finder's File menu, and click OK when the Finder asks if it's OK to replace the Scrapbook file in the System Folder with the one you're moving (putting away) from the desktop.

Resetting Page Setup

Q The Page Setup command's Page Orientation option is always set to Portrait (tall) for a new document. I would like to change this standard setting to

Landscape (wide) so I can automate an Excel macro to plot and print my charts. Could I do this with a resource editor? Currently I have to set Page Orientation to Landscape by hand for every chart before printing.

*Dilip Dudgaonkar
Slidell, Louisiana*

A Excel 3.0 lets you set all Page Setup options with the macro command **Page.Setup** (see the Excel function reference manual for details). If you weren't using a macro to automate chart creation, you could perpetuate your custom chart settings by opening copies of a template chart you made in advance. To make the template, create a new chart, change the Page Setup settings (and other settings) as you like, and save it as a template by clicking the Options button in the Save dialog box and choosing Template from the File Format pop-up menu.

IBM Monitors with LC

Q I own a Macintosh LC and am considering purchasing a larger monitor. I recall reading somewhere that, with the addition of an inexpensive cable, the LC can run IBM monitors. Is this correct, and if so, what type of cable would I use?

*Jason Lang
Guilford, Connecticut*

A The LC can be connected with a special cable to a VGA monitor made for IBM PC-compatible computers. You get the same picture size and number of colors as with a Macintosh 13-inch color monitor. Many companies make VGA monitors; prices vary and so does image quality. Before buying, try to view the VGA monitor you're considering next to a Macintosh monitor. If the computer store where you're shopping can set up this comparison, they can probably sell you the cable you need as well. BMUG

(510/549-2684) sells a \$25 VGA adapter and a \$15 adapter kit (requires soldering). You can also build a cable from scratch (see "LC to VGA").

Recycling Old Software

Q After obtaining a major upgrade to software, is it a violation of the license agreement to give the old version of the software to someone for use on another computer? The new software has a different serial number and its own registration card. Also, there was considerable cost (more than \$100) for the upgrade. I have looked at the license agreement and cannot see that major updates are covered.

*Alan T. Baker
Elmira, New York*

A Because I am not a lawyer I cannot offer advice to you on whether you can legally transfer a software license under any particular circumstances. License agreements vary from one software company to another; one company may even have different agreements for different products. In the final analysis, you must read your own license agreements and make your own decisions (end of weasel clauses).

I will say that reading 16 publishers' license agreements in my software library turned up very few that specifically forbid transferring an old version to someone else. Farallon and Quark prohibit any transfer of their software license, period. Aldus lets you transfer the software but says "... any transfer must include the update and all prior versions..." The other 13 say nothing about upgrades or updates but do explicitly permit transferring the software. When you transfer, you must commonly hand over all disks, manuals, and the license agreement to the recipient. The scope of this re-

continues



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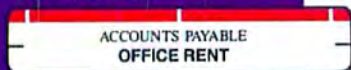
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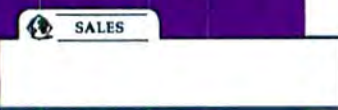


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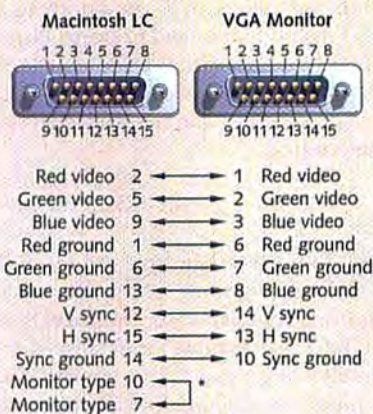
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LC to VGA

Connecting a Mac LC to a VGA graphics monitor (made for DOS PCs) with a cable that follows this official Apple wiring diagram gives you 640-by-480 color graphics. (If you're a real techie, you can build the cable yourself.) The number of colors depends on the amount of VRAM installed in the LC—16 colors with the minimum 256K of VRAM or 256 colors with the 512K VRAM SIMM installed.



* Connect pins 7 and 10 of the LC connector so the LC knows it's connected to a VGA Monitor.

quirement is open to interpretation.

Software publishers probably expect you to discard old versions when you upgrade, or if the new version isn't compatible with documents created by the old version, to keep the old version for use with your old documents. "The best rule to remember is that the upgrade is considered to be an improvement to the original copy and does not create a new license. So according to the copyright law, you cannot give away or sell older versions of software products that have been upgraded," says Alene Rosenthal, general counsel for the Software Publishers' Association (SPA). The SPA also recommends you erase (and reuse) or destroy disused disks from old versions rather than simply tossing them out with the old manuals. Otherwise a scavenger might retrieve the old version, use it, and even audaciously contact the publisher for technical assistance or an upgrade.

RAM Mystery

When my Mac LC had 2MB of RAM, the Finder's About This Macintosh command (in System 7) reported that system software consumed about 1250K. After upgrading memory to 10MB, I found that system software consumes over 3200K. It's the same software configuration, so why does adding 8MB of RAM also add 2MB to the System's memory usage?

Also, I have 32-bit addressing turned off in the Memory control panel. I thought this meant I would have only 8MB available under System 7. However, About This Macintosh reports that Total Memory is 10,240K, and summing the amounts of RAM in use and available seems to bear this out.

What's going on?

Steven Gilmore
San Antonio, Texas

A When 32-bit addressing is off, System 7 can access at most 8MB of RAM. If more is installed, System 7 accounts for the unused excess by blithely adding it to the system software partition shown in the About This Macintosh window. If you turn on 32-bit addressing, your system software will drop back down to about 1250K, giving you another 2048K to open programs. Within minutes you may also experience an inglorious system crash if you are using software that isn't 32-bit clean, a great deal of which still exists.

No Peeking

TIP: The two HyperCard scripts listed in November's *Quick Tips* do prevent users of the stack containing the script from peeking at button locations when pressing ⌘-option (or field locations when pressing ⌘-shift-option), but all that scripting is unnecessary in HyperCard 2.0 and later versions. Instead, just set the Protect Stack command's Can't Peek option. Alternatively, you can type the following line in the Message box or include it in an openStack handler in the stack script:

set the cantPeek of this stack to true

If you do use November's scripts, you should add `pass idle` on a new line before `end idle` and add `pass mouseWithin` on a new line before `end mouseWithin`. These additions make sure the messages get passed along to other scripts in the HyperCard message hierarchy.

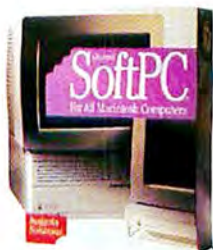
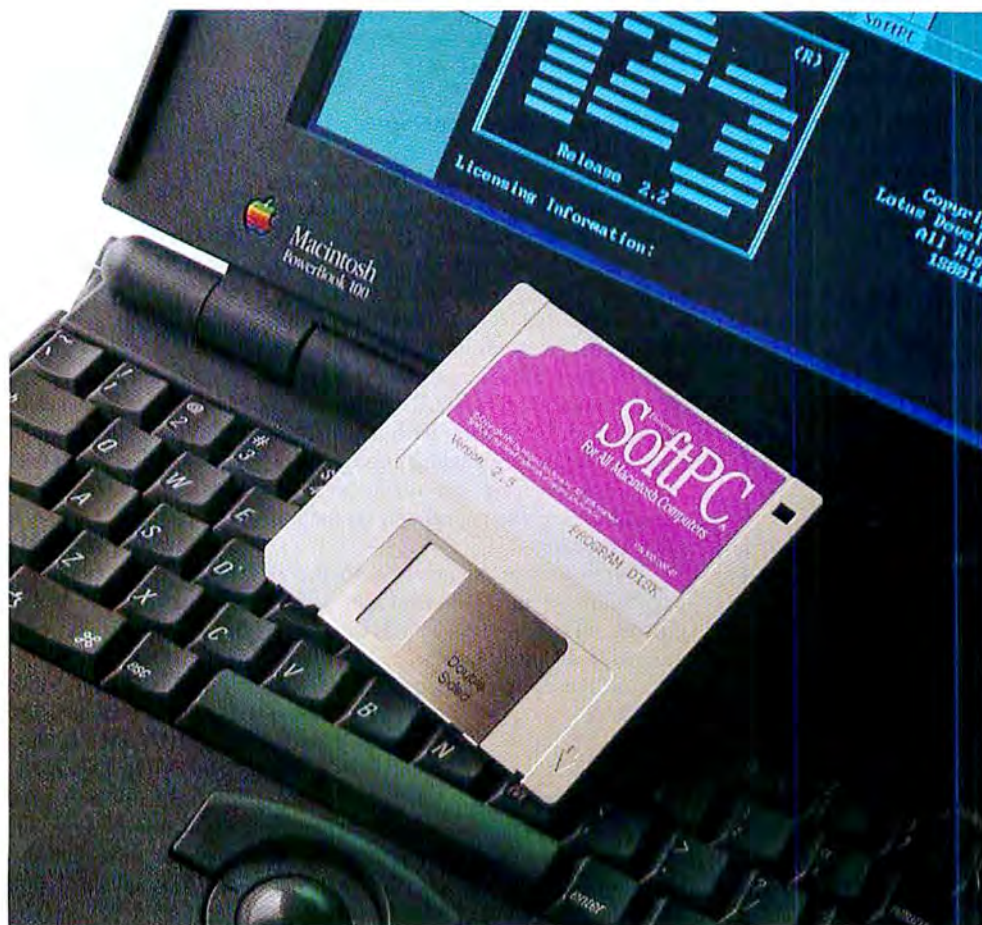
Brian Blood
Richardson, Texas

Accelerating Photoshop

TIP: Here is a technique for speeding up image manipulation on huge (30MB to 100MB) Photoshop documents. Open the document and use the marquee to select a small area in which you need to make some changes. Copy the selection, create a new document (its default size and mode are the same as the Clipboard image's), and paste into the new document. You can manipulate the image in the smaller document much faster than in the large document. When you finish

continues

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working in the smaller document, select it all, go back to the original document, and paste. Voilà! It replaces the original selection pixel for pixel. The time savings are tremendous.

If you want to close the original document while working on the small document, you must save the selection as a path before closing. Then when you re-open the original document, you can re-select the saved path before pasting from the small document.

Jeff Satterwhite
Greensboro, North Carolina

To save the selection path in Photoshop version 1.X, use the Selection->Alpha command and then save the document. To restore the selection, use the Alpha->Selection command.—L.P.

Ending Scrunched Envelopes

TIP: To print single envelopes through a LaserWriter without taking advantage of the printer's Auto Scrunch 'n' Seal capabilities, you simply put a letter-size sheet of quality paper (nothing wimpy) between the envelope's adhesive-coated flap and the envelope body. Feed this combination into the printer against the side of the intake tray. (Note that LaserWriter II users cannot center-feed envelopes with this technique.) The paper provides enough body to avoid scrunching, and if the envelope flap adheres to the paper, you can peel it off very easily.

Here's a great document format and page setup for side-fed envelopes in Microsoft Word: a 9-pica (1.5-inch) top margin, a 25-pica (4.167-inch) left margin, and Landscape orientation.

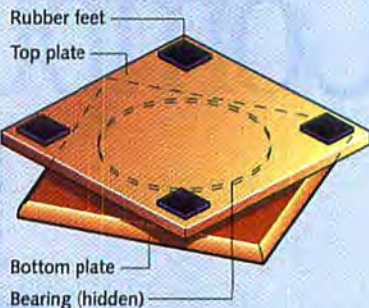
Tim Murray
Alpharetta, Georgia

Cheap Swivel Base

TIP: With parts from a hardware store and no tools, you can make an inexpensive swivel base for a Macintosh and any equipment stacked under it or atop it. The unit doesn't tilt, but it only raises the Mac about .75 inch and is almost invisible when in place. The parts you need include a lazy-Susan assembly (rotating bearing with metal plates) and eight rubber stick-on furniture feet. A 6-inch lazy Susan, fine for a compact Mac, and eight rubber feet cost me \$4.70 at a local hardware store. If you have a larger Mac, you can use an 8-, 10-, or 12-inch lazy Susan and additional feet to support the extra weight.

To make the swivel, simply stick the feet at the four corners of the lazy-Susan assembly, both top and bottom (see "Please Pass the Mac"). If you have a large lazy Susan, stick on additional feet to dis-

Please Pass the Mac



Make a swivel base for your compact Mac from a 6-inch lazy-Susan assembly (with bearing) and stick-on feet from a hardware store. For larger Macs, use a larger lazy Susan and more stick-on feet.

tribute the weight evenly. Then center the assembly under your system.

Mark D. Vermette
Austin, Texas

The rubber feet provide clearance between the lazy Susan's metal plate and the cooling vents underneath some Macintosh models. Be sure the feet rest on a solid part of the Macintosh's case, and not on a louvered vent.—L.P.

Reclaiming MS-DOS Disks

TIP: Would you like to use preformatted MS-DOS disks as Mac disks? Prior to System 7 you had to format them first, using a utility such as SUM Tools' QuickCopy. With System 7, all you do is insert the MS-DOS disk in the internal FDHD SuperDrive, and when asked if you want to initialize the disk, click the Initialize button. (Note: this does not work with an 800K external floppy drive or with the 800K drive installed in the Mac Plus and in older Mac SEs.)

David T. Ramos
Canfield, Ohio

The button is named Initialize only if you insert a 1440K (high-density) MS-DOS disk. If you insert an 800K MS-DOS disk the buttons are named One-sided and Two-sided.—L.P.

LaserWriter Hoaxes

TIP: I've concluded that "laser labels" and "Apple Toner Cartridges" are big hoaxes. For three years I have used Hewlett-Packard toner cartridges in my LaserWriter IINT with no ill effects and a savings of \$20 to \$30 per cartridge. HP LaserJet II and III (but not IIP) cartridges fit LaserWriter II printers. Apparently, continues

"Fastest overall printer..."

InfoWorld PostScript Printer comparison, June 10, 1991.



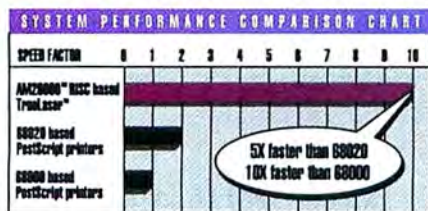
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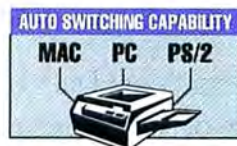
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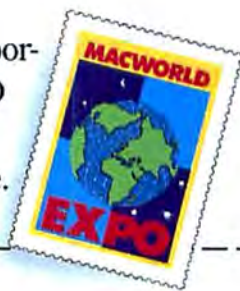


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Scaled Text along a Path

When you scale a logo or something else that involves text along a path, FreeHand 3.0 scales everything except the text on the path (left). To have the text scaled as well (right), Sue Ann Sanders of Oak Creek, Wisconsin, suggests you group the items including the text, set the Group Transforms as a Unit option with the Element Info command, and then scale.



LaserJet I and LaserWriter/LaserWriter Plus cartridges are identical, although I haven't tried them.

For the same three years I have been using non-"laser" labels in my laser printer. I buy Quill brand, 4-inch-by-3-inch continuous fanfold labels and tear them into two- or four-label strips. These strips can be manually fed into a LaserWriter printer or stuffed into an envelope cassette—the cassette lid bulges a bit, but it works. (Ironically, the envelope cassette doesn't work with my number-10 envelopes, which must be hand-fed.) I know this is supposed to cause roller rot, toner trauma, and loss of fertility, but it hasn't; and I've never had a label peel off or jam. In my PR business, I go through several thousand labels a year, printed individually in batches of several hundred.

Gordon Sell
Montclair, New Jersey

I use conventional 4-inch-by-3-inch self-adhesive labels that come 2 per sheet in packages of 80 labels, Avery S6448 or Dennison 43-558. The following printers all use the Canon SX print engine and have interchangeable toner cartridges: Apple LaserWriter II (all models), HP LaserJet II and III, and QMS-PS 815 and 825. The following printers use a different Canon engine, the LX, and their cartridges are interchangeable: Apple Personal LaserWriter LS and NT, HP LaserJet IIP, and QMS-PS 410. And printers that use the Canon CX engine—LaserWriter, LaserWriter Plus, HP LaserJet I, and QMS-PS 810—also have interchangeable cartridges. Readers, if you have used alternative toner for your LaserWriter—toner refills in particular—please let me know your experience. (Sorry, no tip payments for these contributions.) I will summarize the results in a future issue.—L.P.

We Couldn't Restart Because...

TIP: A couple of months ago our Mac IIcx bombed, and we couldn't restart it from its internal hard drive or from a System Tools 6.0.4 disk that worked on another Mac. We carried the IIcx, keyboard, and mouse to our dealer for a "complete" diagnostic. In the dealer's lab our computer started up immediately from its internal hard drive, but back in our office the Mac wouldn't start up. The technician had no explanation except "It must be your software." We experimented and finally discovered the defect was not in the software at all—it was in the mouse. The dealer had not used our keyboard or mouse and never realized our ADB mouse was confusing the system. We substituted a new mouse, and the IIcx beeped back to full consciousness. If your Mac won't start up, don't assume it is a hard drive crash. It may be just a mouse squish.

Charlie Lebeda
Morris Plains, New Jersey

We pay from \$25 to \$100 for tips published here. Send tips or questions (include your address and phone number) to *Quick Tips*, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702) or MCI Mail (294-8078). All published submissions become the property of Macworld. Due to the high volume of mail received, we're unable to provide personal responses. **m**

LON POOLE answers readers' questions and selects their tips for this monthly column. His two most recent books are *Amazing Mac Facts* (Microsoft Press, 1991), a collection of the best published tips; and *Macworld Guide to System 7* (IDG Books Worldwide, 1991).

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Pastel Development 70 Get all your personal information together with DayMaker. Information tools include advanced schedule and to-do list management, categories, priorities, alarms, tickler reminders, address books, phone dialing, Gantt charts, import/export, and calendar output to Filofax pages



\$65

QuicKeys 2.1

CE Software 70 The System 7 savvy version of the leading macro product for the Macintosh. In addition to being fully 32-bit clean and offering Balloon Help, QuicKeys 2 can "drive" applications that support Apple® Events through its Apple Events Extensions.



\$89

More After Dark & After Dark/M.A.D. Bundle

Berkeley Systems 7 Over 25 incredible new displays for After Dark, including Berkeley contest winners Mowin' Man, GraphStat, and Tunnel, plus many beautiful new fish. Includes Virex-D® virus detector module from Microcom. Requires After Dark (order the bundle and save!).



\$26/41

ColorPage T16 Trinitron

E-Machines 70 An affordable full-page 16-inch display with 72 dpi resolution. Features Sony Trinitron technology for sharp, high quality picture. Uses the built-in video on the new Mac Quadra/040. MacUser five-mouser for three years in a row. Ask about rebates!



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Fractal/Wacom 70 Personal Publishing's painting product of the year! Painter delivers real natural media effects, brushes, pens, chalks, and paper grains (22 included). The Wacom tablet has the premier pressure sensitive stylus.



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Ray Dream 7.0 Ray Dream Designer is 3D illustration software, designed to produce high-resolution, full-color graphics with illustration tools like Bezier curves. Supports CAD software with DFX import/export. Jag gets rid of the jagged edges in artwork created in any Mac color paint, photo-retouching, multi-media or 3D software (PICT/PICS).

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FWB 7 This savvy utility is a must for all power users. It supports all SCSI hard drives, removables and opticals with formatting, partitioning, password protection, encryption, benchmarking and more.



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Micro Planning Intl. 7 The ultimate in power, presentation graphics, and ease of use for managing projects of up to 1,500 tasks. Features PERT, GANTT, Outline, or Table formats. Plus custom screens, reports, and chart symbols.

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CE Software 7.0 Tiles saves time and frees up mindspace so you can focus on the project at hand. It automatically organizes your computer environment, and can play macros by importing QuickKeys sequences.



\$78

PowerKey 2.0 w/QuickKeys Lite

Sophisticated Circuits 7.0 Turns on your Macintosh and peripherals from the keyboard. Programmable with an on/off schedule. New open architecture allows access from other applications such as MicroMat's MacEKG. Remote option lets you turn on your system with a single phone call. Works with all ADB equipped Macs. Supports Apple events

FolderBolt

Kent Marsh Ltd. 7.0 Here's simple, effective desktop security. FolderBolt lets you password protect any single folder or group of folders, including the system folder. Creates drop, read only or completely locked folders.



\$75

MacEKG

MicroMat 7 Now includes a new utility called REActivator, which interfaces to Sophisticated Circuits PowerKey 2.0, allowing technicians to REALLY test all the of the Mac's facilities. Virtually a "diagnostic dashboard" for your Mac.

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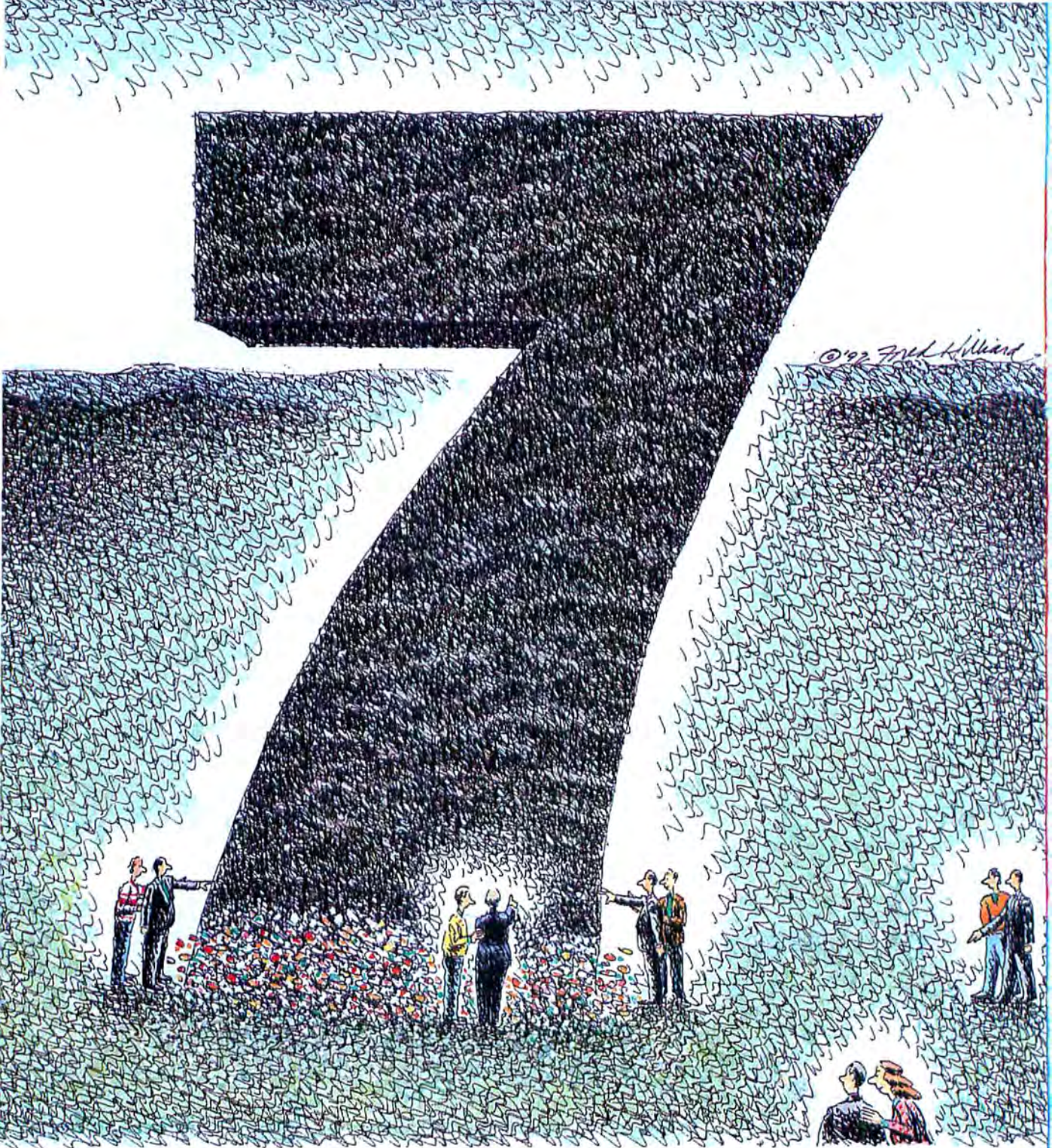
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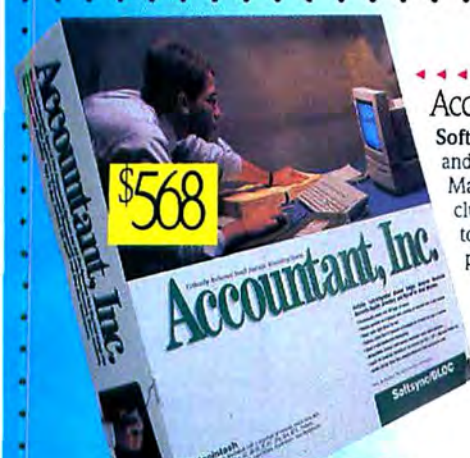
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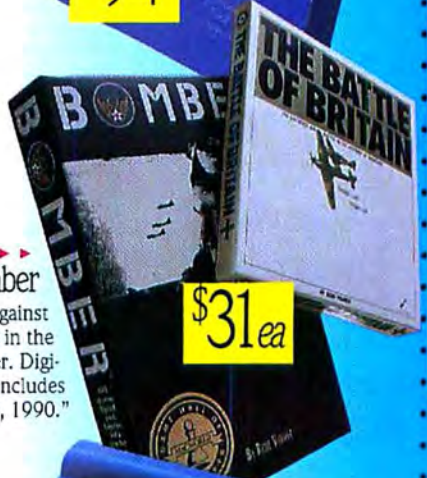
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ACCESSORIES

Advanced Gravis

- MouseStick 59
- SuperMouse 84

Apple

- Toner/Laserwriter II 105

Articulate Systems

- HeadSet Mike 118
- Voice Impact Pro 218
- Voice Navigator II 548
- Voice Record Software 58

CoStar Corporation

- LabelWriter II 1" Head 185
- Stringray Trackball 89

Everex

- Silhouette Trackball 79

Farallon

- MacRecorder 2.0 169

Fellows

- Diskette Holder
Teakwood/Holds 45 18
- Teakwood/Holds 120 32

Golden Ribbons

- Imagewriter Multi Color 9
- Imagewriter Ribbons - Black 4

Kensington Microware

- 7' Long ADB Keyboard Cable 24
- Apple Security Kit System 33
- SE Rad/Anti-Glare Filter 52
- Turbo Mouse Adb 107

Key Tronic

- Mac Pro Plus 143
- TrackPro 218

L.B. Innovators, Inc.

- WristSaver
Red, Charcoal or Navy Blue 12
- WristSaver Mouse Pad
Red, Charcoal or Navy Blue 12

Mac's Place

- 7 Outlet Noise/Surge 15
- Mac's Place Speed Pad 7

Mac's Place Cable

- Macintosh Cables (Full Line) 1

Maxell

- 150Meg BU Tape CS600XD 22
- 60Meg BU Tape CS600HD 18

MSC Technologies

- Little Mouse ADB 74

Sony

- Double Sided 10 Pak 9
- Double Sided-Bulk 50 Pak 33
- HD-Bulk 50 Pak 60
- High Density 10 Pak 15

Targus

- Mac/SE Bag Black 54
- Extended Keyboard Bag
Black, Navy, Gray, or Wine 68

BUSINESS

ACIUS

- 4th Dimension V2.2 478

Advanced Software

- Docucomp 87
- AEC Management Systems
FastTrack Schedule 1.5 135

After Hours Software

- TouchBASE 2.0 79

Attain Corp.

- In Control 94

Caere Corporation

- OmniPage w/Spell & Draft 489

CE Software

- QuickMail 2.5 1
- 1 User Add-On 62
- Single User 138
- 5 Users 249
- 10 Users 375
- 50 Users 1549

Ceres Software

- Inspiration 3.0 158

CheckMark Software

- Cash Ledger 115
- MultiLedger 2.0 225
- Payroll 169

Chip Soft

- Macintax 1040 '91 "Headstart" 59
- Macintax 1040 '91 w/Quicken 88

Clarix

- Clarix Resolve 268
- Clarix Works 148
- FileMaker Pro 208
- MacProject II 348
- MacWriteII & Correct Gram. 136

CompuServe

- CompuServe Membership Kit 21
- CompuServe Navigator 45

DeltaPoint

- DeltaGraph Professional 192

Farallon

- Timbuktu 4.0 129
- Timbuktu Remote 2.0 134

Fox Software

- FoxBASE+Mac 289
- FoxBASE+Mac MultiUser 379

FreeSoft Company

- White Knight V11 65

Great Plains Software

- Plains & Simple 255

IBSO

- Data Club 3 Users 189
- Data Club V2.0 10 User 498

Insignia Solutions

- Soft PC
2.5 Universal 239
- 2.0 - Classic, LC, SE & Port. 125
- Soft Node 109

Intuit

- Quicken 3.0 38

MECA Software

- Managing Your Money 4.0 134

Micro Planning Intl.

- Micro Planner Manager 378

Microsoft

- Excel 3.0 298
- Office 478
- PowerPoint 242
- Project 448
- Word 4.0 239
- Works 159

New Era Software

- nuBASE 179

Nolo Press

- For The Record 30
- Will Maker 4.0 35

Odessa

- Double Helix Vers. 3.5 425

ON Technology

- Instant Update-2 User 278
- Meeting Maker (5 User) 289
- Meeting Maker (10 User) 549

Paragon Concepts

- Nisus 3.06 238

Pastel Development

- DayMaker 65

Peachtree Software

- At Once! 188

Portfolio Systems

- Dynodex 2.0 71
- Dynodex 1.0 72

Prescience

- Expressionist 77
- Theorist 245

ProVUE Development

- Panorama II 239

Quark

- XPress 498

Reality Technology

- Wealth Builder 94

Softsync

- Accountant Inc. 339

Software Ventures

- MicroPhone II V4.0 215

Spider Island Software

- TeleFinder
Professional Single User 52
- Group Edition Unlimited 272

Symantec

- GreatWorks 1.0 198
- More 3.1 264

Symmetry

- Acta 7 74

T/Maker

- PowerBundle 158
- Smartbundle 214
- WriteNow 2.2. W/ MacTools
and GrammatikMac 98

Telaware

- M.Y.O.B. 139

Timeslips Corporation

- TimeSlips III V2.1 192
- Tops/Sitka
Tops 3.1 Network Bundle V3.1
195

Wolfram Research Inc.

- Mathematica Std 2.0 498
- Mathematica Enhanced 2.0 788

WordPerfect Corp.

- WordPerfect V2.0 278

GRAPHICS

3G Graphics

- Images W/Impact
Accents And Borders 63

Adobe

- ATM Plus Pack 118
- Illustrator 3.0 w/ATM 2.0 368
- Photoshop 2.0 549
- Streamline 2.0 117
- Type Manager 59

Type Sets for Business

- Invitations & Awards 95
- Letters, Memos & Faxes 95
- Overheads & Slides 95

Aldus

- Freehand 3.0 397
- Gallery Effects 128
- Pagemaker 4.0 497
- Personal Press 325
- Persuas on 2.0 325
- SuperPaint 3.0 129

Altsys

- Fontographer 3.3 262
- Metamorphosis 89

Ares Software

- FontManager 62

Baseline Publishing

- Color Mac Cheese 49

Broderbund

- Banner Mania 35
- Print Shop 35
- TypeStyle 2.0 w/ATM 126

Clarix

- Clarix CAD 598
- MacDraw II 299
- MacDraw Pro 278

Custom Applications

- Freedom of Press Lite 55

Delta Tao Software

- Monet 238

Deneba

- Canvas V3.0 248
- Ultrapaint 124

Eastgate Systems

- Fontina 35

ElseWare Corp.

- DataShaper 135

FM Waves

- Agenda for the 90's 52
- Business Cartoons 52
- Education 52
- EPS Borders 26

- Fantasy 52
- Fashion 52

Fractal Design

- Painter 258

Frame Technology

- FrameMaker 594

Gold Disk

- Animation Works 119

MacroMind/Paracomp

- FilmMaker 429
- MacroMind Director 689
- Model Shop V2.0 0

- Swivel 3D Professional 429
- Swivel 3D V1.2 294

MicroFrontier

- Color It! 69

Motion Works

- ProMotion Call

Pixar

- Showplace/MacRenderMan 644
- Special International 647

SuperMac Software

- PixelPaint Pro 465

Symmetry

- Mariah 69

Timeworks

- Publish It! Easy 138

CD-ROM

Cyan

- Cosmic Osmo 45
- The Manhole 37

Discovery Systems

- Berkeley BMUG PD ROM 88
- Nautilus BackPac 44
- Nautilus Subscription 20

Everex

- EMAC Metro CD ROM Drive 469

FM Waves

- DTP Pro CD-ROM 88
- FM Waves CD-ROM I or II 148

HyperGlot Software

- Learning To Speak French 59
- Earning To Speak Spanish 59

ICOM Simulations

- Sherlock Holmes Detective 44

Optical Access

- CD/Performer (500 ms) 498
- CD/Allegro (310 ms) 648

Pixar

- Showplace/MacRenderMan 448

Quantum Leap

- CD-7 Super Library 49
- Giga-ROM - Super Library 98
- Macademic - Education Library 73

EDUCATIONAL

Broderbund

- Calc., Geom., or Phys. 59
- Kid Pix V1.2 37
- Type! 18

Davidson & Associates

- Alge-Blaster Plus 34
- Dinosaur Discovery Kit 27
- Math Blaster Mystery 28
- Math Blaster Plus 34
- SAT Personal Trainer 34
- Speed Reader II 28

Great Wave Software

- Kidsmath 25
- Kidstime 25
- Number Maze 25
- BBW 25
- Color 33
- Dec & Frac Color 33

HyperGlot Software

- KanjiMaster-Beg. (Japan) 98
- Pronunciation Tutor
French, German, Spanish 34

Word Torture 4.0

- Russ., Span., Fr., Ger., Ital. 33

Knowledge Revolution

- Interactive Physics 188

Learning Company

- Math Rabbit 30
- Reader Rabbit 3.0 36
- Writing Center Call

MECCO

- Number Munchers 28
- Oregon Trail 28
- Word Munchers 28

Nordico

- MacKids
Pre-Schoolpack 35
- Turbo Math Facts 25
- Word Quest 31
- Word Search Deluxe 35

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OVERNIGHT
\$3

Mindscape	
Crossword Magic	29
Sierra On-Line	
Space Quest IV	34
Silicon Beach Software	
Dark Castle or Beyond	32
Sir-Tech Software	
Wizardry or II	29
Wizardry Bane/Cosmic Forge	35
Software Heaven	
OLDS	25
Software Toolworks	
Chessmaster 2100	29
Cabbage King/Gin King	24
Hunt For Red October	20
Life And Death	29
Spectrum Holobyte	
Falcon 2.2	33
Verto	32
Tetris/Woltris or WordTris	23
Strategic Simulations, Inc.	
AD&D: Silverblades	38
AD&D: Curse of Azure Bonds	38
AD&D: Pool Of Radiance	32
Strategic Studies Group	
American Civil War Vol 1	30
Gold of the Americas	30
Halls Of Montezuma	28
Parizer Battles	28
Reach for the Stars	30
Rommel Battles for N. Africa	28
Warlords	38
Three Sixty Pacific Inc.	
Armor Alley	33
Harpoon	39
Harpoon BattleSet #2 or #3	20
Harpoon Scenario Editor	28
Sands Of Fire	32
Velocity	
Spectre	38

HARDWARE

Applied Engineering	
AEHD Superdrive	219
Checho-In 50 Ili w/68882	1636
FastMath LC/68882 16MHz	138
MacRam Classic Memory Card 44	
Quadrant Link w/AE Shadow	199
QuickSilver Ili	239
DataLink Express II W/V.42 & MNP 5	
Send & Receive Fax	218
TransWarp Accelerators	
SE 25MHz w/FPU	789
SE 40MHz w/FPU	1499
LC 25MHz w/FPU	828
LC 40MHz w/FPU	1378
Asanté	
10T Hub	698
MacCon3 Ili	269
MacCon3 NB	269
MacCon3 SE	269
Caere Corporation	
Typist+ Graphics	479
Dayna Communications	
DaynaFILE II	
1.2MB/1.44MB Dual Drive	688
DaynaPORT Ethernet Cards	
E30-T	218
E4C-T	208
E4C-TFP	328
E4C-T	208
E4C-TFP	328
E4C-T (External)	288
DayStar Digital	
DualPort Ili	99
Fast Cache Ili 64K	268
PowerCache/SE/30, all Ili, and LC	
33MHz	738
40MHz	698
50MHz	1398
Dove	
DoveFax Desktop Plus V2.0	358
DoveFax Desktop V2.0	289

E-Machines	
QuickView Sound	275
QuickView Studio 1.1	1695
QuickView Studio Software	428
QuickView Video	398
Color Displays	
ColorPage E16	1045
ColorPage T16	1758
T19	2958
TX	1758
Color Interface Cards	
DoubleColor	345
DoubleColor LC	425
Futura EX	568
Futura MX	1395
Futura SX	1058
Futura SX/8	658
TX SE30/8 and T19 SE30/8	898
TX/8 and T19/8	898
TXsi and T19si	898
Everex	
EMAC 150MB Tape Backup	578
Farallon	
PhoneNET	
Connector (10P)	195
Connectors	29
LocalTalk Card	203
Star Connector (10P)	119
StarController-EN	1378
Global Village	
TelePort	
9600 SendFax	179
A300 (2400 bps)	128
Golden Triangle	
DiskTwin (Nubus or PDS)	748
Harris Labs	
Performer 16 MHz Accel	248
Performer Math Co-Proc 6888178	
Logicode	
Quicklet Fax Modems	
9624 Send/Receive	148
9624 V.42bis Send/Receive	198
Quicklet Modems	
2400 V.42bis	158
9600 V.32/V.42bis	498
Micron	
XCEED Color 30	279
XCEED MacroColor II	469
Microtek	
ScanMaker 600GS	1058
ScanMaker 1850S	2258
ScanMaker 600ZS	1445
TrueLaser Printer	1398
Nuvotech	
Turbo Net - Din-8	19
RasterOps	
Color Monitors	
19" ColorCad Trinitron	3288
19" Hitachi	2089
19" Trinitron Monitor	2789
21" Hitachi Monitor	3398
Color Video Boards 13", 19", 21"	
264 SE/30 (24 Bit)	578
RasterOps 24S	398
RasterOps 24SI	598
Color Video Boards 13", 19", 21"	
24XL	2598
BLC	598
BXL	668
BXL	1298
ColorCad 228	1298
Monochrome/Grayscale Monitors	
19" Mono/Gray-Scale	998
21" Mono/Gray-Scale	1358
Video & Multi Media	
24XLTV	2989
Expresso Pers Slide Scan	668
ImagePak Still Compression	328
ProVideo 32	1298
ProVideo PAL	1658
RasterOps 24STV	1188
TV Tuner	328
Video ColorBoard 364	659
Video Exp (NTSC or PAL)	469
Video Boards-Grayscale	
ClearVue/GSLC	598
ClearVue/GSXL	668

Video Boards-Monochrome	
ClearVue/Classic, LC or XL	ea 328
Shiva	
Ethergate	1289
FastPath 5	1895
NetBridge	399
SIMMO	
Single Inline Memory Modules	
SIMM 1 Meg 80ns	39
SIMM 2 Meg 80ns	99
SIMM 4 Meg 80ns	159
SIMM FX 4 Meg 80ns	169
SIMM FX/NTX 1 Meg 80ns	45
Sigma Designs	
DoubleUp w/ Disk Doubler	184
Sophisticated Circuits	
PowerKey Remote	32
PowerKey w/QuickKeys Lite	Call
Supra Corp.	
Supra Modem	
2400	109
MacPac 2400	169
Plus 2400 (MNPS, V.42 BIS)	178
Supra FaxModem Plus MacPac	199
Thunderware	
Lightning Scan 400	379
LightningScan Pro 256	518
Wacom	
12X12 Digitizers Cordless Stylus	
Electro Static/Firm or Soft Stylus	898
Standard/Firm or Soft Stylus	828
6 X 9 Digitizers Cordless Stylus	
Standard/Firm or Soft Stylus	558

HARD DRIVES

CRU	
Case Opener/Torx Kit	8
Internal Mounting Kits	
Mounting Bracket (Ili/II/III)	19
Mounting Bracket (SE/II)	19
CRU Hard Drive Case	
Half Height Case Platinum	109
DataPlace	
External Hard Drives	
DP 52 Mb Quantum	269
DP 105 Mb Quantum	358
DP 170 Mb Quantum	698
DP 210 Mb Quantum	689
DP 425 Mb Quantum	1298
DP 676 Mb WrenRun II	1998
Removable Syquest Hard Drives	
DP 44 Mb w/cartridge	458
DP 88 Mb w/cartridge	598
Imagex	
Bernoulli	
Transportable 90Mb	788
Dual Drive 90Mb	1688
Kit w/MacTools Deluxe	39
Kit w/Retrospect	98
Single 90Mb Cartridge	139
Tri-Pack 90Mb	438
Quantum 3.5" Drive	
Half Height Drive	
210-MEG 15ms	638
425-MEG 15ms	1279
Low Profile	
ProDrive LPS 52MB	238
ProDrive LPS 105B	359
Seagate Technology	
Full Height Drive	
WrenRunner II 676 Meg	2088
Syquest	
44 MEG Cartridges	66
88 MEG Cartridges	118

MUSIC

Ars Nova	
Practica Musica 2.3	66

Electronic Arts	
Deluxe Music Con Set 2.5	82
Opcode Systems	
Book Of MIDI	29
EZ Music Starter Kit	155
EZVision	99
Galaxy Universal Librarian	198
MIDI Translator	42
Studio 3 Midi/Smpte Interface	288
Vision	378
Passport Designs	
Audio Trax	197
MIDI Interface	74
Note Writer II	348
PG Music	
Band In A Box	56

PROGRAMMING

Bowers Development	
AppMaker	214
Claris	
Hypercard V2.1	148
Microsoft	
QuickBASIC 1.0	64
Symantec	
Just Enough Pascal	49
Think C 5.0	209
THINK Pascal 4.0	159
Think Reference	59
TGS Systems	
Prograph V2.5	298
Zedcor Inc	
ZBasic 5.0	95

BOOKS

Addison Wesley	
C++ Prog w/MacApp & Disk	27
Guide to Mac Family Hardware	21
Mac C Programming Vol 1 or 2	19
Mac C Programming Vol 2	19
Mac Pascal Prog. Vol 1	19
Macintosh Program Secrets	18
Progs. Online Companion	32
Inside Macintosh Series	
Vol. 1	18
Vol. 2, 4 or 5	19
Vol. 3	17
Vol. 6	38
X-REF for Vol. 1-6	9
Inside Out Series	
Complete Book of HyperTalk 2	19
Elements of C++ Mac Prog	19
Learn C w/Think C Lite	28
Mac Prog Guide MPW Vol 1	19
ResEdit Ref. (w/ResEdit 2.1)	23
System 7 Revealed	18
Bantam Books	
Hypercard Handbook	21
Microsoft Press	
MS Excel 3 Companion	20
Peachpit Press	
Canvas 3.0: The Book	17
DataBase 101 W/ Demo Disk	14
Little Mac Book, 2nd ed.	12
Little Quickkeys Book	12
Little System 7 Book	10
Macintosh Font Book	18
QuarkXpress Book	20
Real World Freshand	22
Ventana Press	
The System 7 Book	19

UTILITIES

Advanced Software	
Intouch V1.1	39
QuickTools	38
Aladdin Systems	
StuffIt Deluxe 2.0	59

Alsoft	
DiskExpress II	53
Alysis Software Corp.	
SuperDisk 2.0	56
Baseline Publishing	
INIT Manager	33
Thunder 7	55
Berkeley Systems	
After Dark & M.A.D. Bundle	41
After Dark 2.0	26
More After Dark (M.A.D.)	26
Bright Star Technology	
At Your Service	29
New Actor Add-Ons	na 10
Casady & Greene	
Crash Barrier	48
QuickDex II	22
CE Software	
Alarming Events	83
Calendarmaker 3.0	31
Disktop 4.0 & Goler & Util	62
QuickKeys 2.1	85
Connectix	
Compact Virtual+ 68000s	72
HandOff II 2.2	55
Maxima 2.0	45
Virtual 3.0	88
Dantz Development	
DiskFit Pro	78
Retrospect	145
Retrospect w/Remote 10 pk	264
Dayna Communications	
Dos Mounter V2.0	53
Dubi-Click Software	
ClickChange	58
Fifth Generation	
Fast Back II	118
Suitcase II V2.0	49
SuperLaserSpool 2.0	82
Superspool 5.0	57
Golden Triangle	
DiskMaker	56
Twinit (Software)	172
ICOM Simulations	
On Cue II	Call
Insight Development	
MacPrint 1.2	84
Kent Marsh LTD	
NightWatch II	Call
GuardCard	Call
Microcom	
Virex	57
MicroMat	
MacEKG	63
Microseeds	
HAM	49
Redux	49
Now Software	
Now Utilities V3.0	83
ON Technology	
On Location 2.0	74
Sebastian Software	
Image Grabber 2.0	34
Salient	
Disk Doubler	38
SoftWriters	
7-Updater (B User)	66
Version Territory 2.0 (10 user)	138
Version Territory 2.0 (Unltd)	1388
Sound Source Unlimited	
SoundWare	
Star Trek Sounds Vol. 1 or 2	29
Symantec	
Norton Utilities V1.1	73
S.A.M.I.I.	59
S.U.M.I.I.	96
Thought I Could	
Wallpaper	39
Working Software, Inc.	
Last Resort	38

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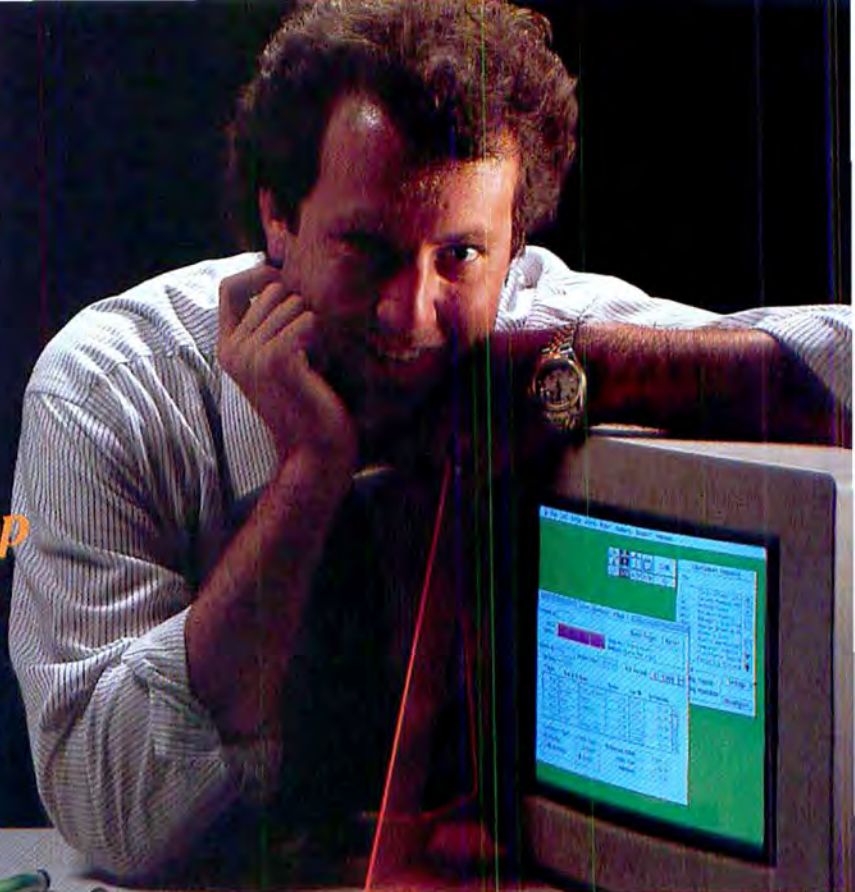
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And deadbeats to collect from—only I had no idea who owed us how much or for how long. Some suppliers may have even

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I found atOnce! The manual looked orderly. I dug in...

The familiar with the unfamiliar
atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home.

Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

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I started off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices—and atOnce! calculated sales tax. Nice. Printed the invoices which I re-designed in atOnce!—realign a field here, change a font there. The usual.

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Alternative Mass Storage

BY JIM HEID

SOONER OR LATER YOU WILL fill your Mac's hard drive. It will happen sooner if you're into megabyte-munching applications such as image scanning or digital audio recording. Or it might happen later, as you acquire more and more software and use it to create more and more documents. Whenever it happens, you'll face the ugly chore of *archiving*—copying dusty old folders and files to floppy disks to free up space on your hard drive.

Even if you don't worry about a hard drive's finite capacity, some of its other limitations may concern you. Internal hard drives simply aren't portable—which makes it difficult to move a large number of files to a different Mac. And if you store confidential information, you have to resort to security programs, which scramble and unscramble files based on passwords you type. Programs such as Fifth Generation Systems' Disk-Lock work, but they add hassles to your work routine—especially if you forget a password.

Although external hard drives are more mobile and can be locked in a safe, you need to wrestle with SCSI cables before you can move them around. What's more, external drives are still delicate instruments that aren't designed for frequent travel. And most make a big bulge in a briefcase.

The ideal storage device would combine the mobility and security of a floppy disk with the speed and space of a hard drive. The good news is that many such devices exist, each with its own merits. Some, such as optical drives, store as much data as would fit on a half-dozen high-capacity hard drives. But because they're slow, such devices are useful primarily for backing up hard drives and for secondary storage—holding files you want to have handy but don't need lightning-fast access to. Others, like removable-media drives, don't store quite as much but are as fast as many hard drives, making them ideal for backing up or replacing a hard drive. Still other devices, WORM drives, can hold the contents of a small library—but you can't erase those contents. This month I explore the most

popular alternative mass storage devices. "Storage Options at a Glance" lists the salient points of each technology.

Media on the Move

THE ONE TRAIT ALL HARD DRIVE ALTERNATIVES share is that their media—the stuff that holds the data—are removable. When you've filled one cartridge, eject it and pop in another. Or use cartridges dedicated for certain tasks—word processing, desktop publishing, and so on.

The most popular removable-media drives in the Mac world are built around a mechanism manufactured by SyQuest and licensed to many well-known hard drive vendors, which then package and sell them under their own labels. SyQuest drives include Mass Microsystems' Data-Pak series, Peripheral Land's (PLI) Infinity Turbo 40, and MicroNet Technology's MR-45 and MR-90, to name only a few. The SyQuest mechanism works much like a conventional hard drive, except it uses a single metal platter instead of several, and the platter itself lives in a portable plastic cartridge that you can eject. What about dust, a hard drive's biggest enemy? When you insert a cartridge, the drive spins the platter at high speed for a few seconds in a routine designed to blow foreign intruders away.

The original SyQuest mechanism used cartridges that held roughly 44MB—the equivalent of more than 30 high-density floppy disks. Last year SyQuest unveiled a new mechanism that stores 88MB on similar cartridges. Both mechanisms are almost as fast as the 40MB internal hard drives most Macs come with. The new drives can read from, but not write to, 44MB cartridges. The 44MB mechanism is still manufactured, and many firms offer both. As you'd expect, the 88MB version costs more. For example, FWB's hammerDisk44 retails for \$1099, while the hammerDisk88 goes for \$1499. Similarly, Relax Technology's Relax Mobile 44 Vista sells for \$429, while the Mobile 88 Vista sells for \$599. Cartridge prices are similar: 44MB cartridges usually sell

for between \$68 and \$116 each, while 88MB versions cost between \$119 and \$229, depending on where you buy. Some firms also sell versatile dual-drive models. With such a box, you can use both drives for primary storage, or use one to back up the other.

SyQuest removable drives have had a mixed reputation since their debut in 1988. On the whole, they have not proven to be as reliable as conventional hard drives. One reason may be the design of the cartridges themselves—their simple case does little to protect the metal platter from contamination. With older SyQuest mechanisms, you can also eject a cartridge while its platter is still spinning, risking damage to the drive's heads and the platter.

But another factor may be a lack of quality control, since SyQuest markets its drive mechanism to so many different vendors. Some SyQuest-based drives are sold by bargain-basement, mail-order vendors that don't extensively test new mechanisms or cartridges and that use cheaper power supplies and other internal components that can directly affect the drive's reliability. This isn't to say that all mail-order drive vendors sell junk or that you must pay top dollar to get a good drive. But you should shop carefully—ask for recommendations at a user group or desktop publishing service bureau. (SyQuest drives are popular among desktop publishers and graphic artists, who often work with huge files that they need to transport to clients and service bureaus.) Also see "Expansion Made Easy" (*Macworld*, May 1991) for a comparison of removable-media drives.

Incidentally, although all vendors use the same basic SyQuest mechanism, you can't always move cartridges from one brand of SyQuest drives to another. Each vendor is responsible for supplying the low-level SCSI driver software that enables the Mac to access the cartridge, and one company's software may be incompatible with another's. If you are buying a SyQuest drive to

continues



*Where
to turn when
a hard
drive isn't
enough*

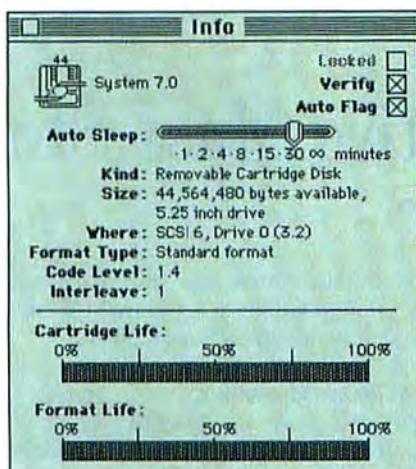
exchange files with someone who already has one, make sure that the two drives can read each other's cartridges. Similarly, if you're acquiring multiple drives, consider buying from one source.

The Bernoulli Effect

THE SYQUEST DRIVES' BIGGEST COMPETITION comes from Iomega, whose Bernoulli (pronounced *bur-NOO-lee*) removable drives have been around in one form or another for nearly ten years. Early Mac models stored 20MB on bulky cartridges, but the latest store 45MB or 90MB on cartridges that are slightly smaller than their SyQuest equivalents.

A Bernoulli drive takes advantage of fluid dynamics principles discovered by eighteenth-century mathematician and physicist Daniel Bernoulli. Inside a Bernoulli cartridge, two spinning flexible disks generate air pressure that forces each disk toward the drive's read-write heads. The same airflow that brings the media to the heads blows dust away from the media. If a foreign invader withstands the wind and wedges itself between the media and the heads, the disks flex to allow it to pass. It's a slick technology that has proven to be very reliable.

On the downside, the media inside the cartridges does wear out over time,



How Much Time Do I Have? Iomega's Workshop utility lets you monitor the health of a Bernoulli cartridge. The Auto Sleep option also lets you specify that a cartridge's disks spin down after a period of inactivity. Designed to conserve battery life on the Bernoulli Portable, this feature also prolongs the cartridge's life—and silences the noisiest part of a Bernoulli drive.

although Iomega warrants cartridges for five years (most firms selling SyQuest cartridges offer only one- or two-year warranties). Bernoulli drives include a utility that tells you how much cartridge life is left (see "How Much Time Do I Have?").

Bernoulli drives are also noisier than SyQuest ones, and the heads in 44MB models require periodic cleaning. The process takes about a minute, but it's a chore that's easy to forget. (The new 90MB drives are self-cleaning.)

Bernoulli drives have a better reliability track record than SyQuest drives do, thanks largely to the Bernoulli technology. But another reason may be that Iomega doesn't sell its mechanisms to other vendors, some of which may be those bargain-basement types that compromise quality. Ocean Microsystems (formerly Bering Computer) used to sell fine Bernoulli-based drives under the Totem moniker, but discontinued the line when Iomega introduced its 90MB units—and slashed prices on its 45MB drives. Iomega is currently the only source for Mac-compatible Bernoulli drives.

As a result, you won't find the wide price spread—or the bargain prices—that exist in the SyQuest and hard drive worlds. Iomega's battery-powered Bernoulli Portable 44 retails for \$1599; the Transportable 44 sells for \$1259; the Dual 44 is \$2399. The Transportable 90 retails for \$1149, while the Dual 90 goes for \$2249. (Yes, you read that correctly: the 90MB drives cost less than the 44MB

continues

PHOTOREALISM



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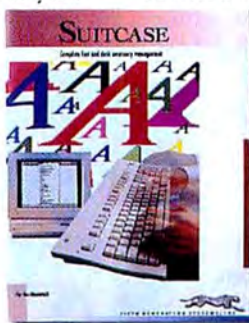
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FIFTH GENERATION SYSTEMS, INC

Circle 151 on reader service card

models. Iomega says it streamlined its manufacturing and engineering processes when developing the 90MB drives, and as a result, the drives cost less to produce. The only reason you might want to buy a

44MB drive is if you already have other 44MB drives and cartridges. The 90MB drives can't write to 44MB cartridges, although they read from them.)

Ricoh: The Late Arrival

GCC TECHNOLOGIES AND MICROTECH International are among a handful of firms selling cartridge drives built around a Ricoh mechanism that, like a SyQuest drive, uses a rigid disk platter. The platter in a Ricoh cartridge, however, is better protected against dust and contamination by several air filters and seals. A Ricoh cartridge's locking door also makes it more difficult to accidentally finger the platter inside.

But Ricoh cartridges store only about 50MB—roughly half as much as the latest SyQuests and Bernoullis store—and the drive prices are a bit steep. GCC's UltraDrive 50R sells for \$1099, while Microtech's R50 retails for \$1299. Cartridges sell for \$129 each. And the fact that there just aren't many drives out there may be a drawback if you're buying a cartridge drive to exchange large files with others.

Life with a Cartridge

USING ANY ONE OF THESE REMOVABLE-cartridge drives is a lot like working with

a hard drive or floppy disks, but there are a few differences to keep in mind, especially with SyQuest-based drives. Ejecting a SyQuest cartridge is a multistep process: drag the cartridge's icon to the Trash, press a stop button on the drive, and then flip an eject lever on the drive. In a related vein, some SyQuest drives won't recognize a cartridge inserted after you've started up the Mac. Better SyQuest vendors include system extension software that enables the Mac to recognize cartridges inserted after start-up. (Bernoulli and Ricoh drives include this software.)

If you use Apple's System 7 with a 68030-based Mac (or with a 68020- and PMMU-equipped Mac), you should know that System 7's virtual memory feature isn't available when the start-up drive is a removable cartridge. Virtual memory requires the use of a *swap file* containing the data that System 7 swaps between real memory and the drive. If you were to eject a cartridge containing the swap file, you'd perform the equivalent of removing a car's tires while it was moving, and the results wouldn't be pretty.

As someone who uses Bernoulli drives for primary storage, I found this particularly frustrating. Then I discovered

continues

Double the Data

Iomega's 90MB Bernoulli cartridges have more than twice the capacity of their 44MB predecessors. Because 44MB Bernoulli cartridges use a rustlike iron-oxide medium that is relatively difficult to magnetize, the particles have to be spaced farther apart. The new 90MB cartridges use a metal-particle magnetic media that has twice the magnetic response as iron oxide, so data can be packed more tightly on the disk. A 44MB cartridge contains 28,000 bits per inch and 1100 tracks per inch; a 90MB cartridge has 37,000 bits per inch and 1600 tracks per inch. Because bits on the 90MB disk are closer together (and both 90MB and 44MB disks spin at the same speed), more bits are transferred by the 90MB drive in the same amount of time, which means a faster data-transfer rate.

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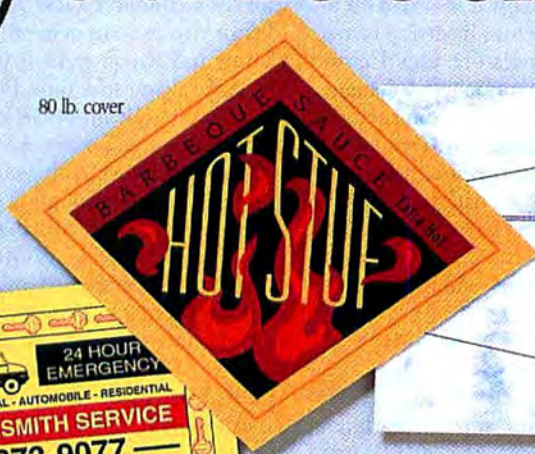
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Circle 143 on reader service card

STORAGE OPTIONS AT A GLANCE

Technology	SUITABILITY TO TASK			Pros	Cons
	Primary Storage	Secondary Storage	Backup		
SyQuest removable drives	very good	excellent	excellent	large installed base of users; inexpensive	mixed reliability track record
Bernoulli removable drives	very good	excellent	excellent	reliable	costly, noisy; portable and transportable drives are heavy
Ricoh removable drives	very good	excellent	excellent	potentially more reliable than SyQuest drive	costly; cartridges hold only 50MB
Erasable optical drives	poor	very good	excellent	large capacity; low cost per megabyte	costly; too slow for primary storage
WORM drives	poor	very good	poor	large capacity; stored data is immune to magnetic fields and erasure	costly; slow
Tape drives	poor	poor	excellent	inexpensive; many drives to choose from	not suitable for primary or secondary storage

FWB's Hard Disk Toolkit software, which allows you to make virtual memory available for ejectable cartridges. The software includes a terrific array of features for formatting and fine-tuning drives of all kinds. It includes software that enables the Mac to recognize SyQuest cartridges inserted after start-up, as well as formatting software that can overcome the incompatibilities between SyQuest drives from different vendors.

Finally, if you're carrying a cartridge around this winter, allow it to warm up to room temperature before inserting it in a drive. Otherwise, moisture could condense on the platter surface and damage it as well as the drive. When summer arrives, don't leave cartridges in a sunbaked car, where the heat could cause their cases to warp. And keep cartridges (and all disks, for that matter) away from items that generate magnetic fields, such as speakers, electric motors, and telephones.

Higher Capacity, Lower Speeds

FOR SOME APPLICATIONS—BACKING UP A 300MB hard drive, for example, or archiving color scanned images or digital audio recordings—even the 90MB provided by the latest Bernoulli and SyQuest cartridges may not be enough. A variety of optical drives are available whose cartridges store between 128MB and 900MB. Alas, none of these digital warehouses are as fast as a SyQuest, Bernoulli, or Ricoh drive, although some come close. Today's optical drives remain best suited to backup and secondary storage.

There are several optical storage approaches, and all use lasers. *Magneto-optical*, also called *erasable optical* (EO), drives use a high-power laser and an electromagnet to orient magnetic particles embedded in the platter's plastic surface. To read data, the drive turns the laser's intensity down and interprets the reflections from

the magnetic particles. The platter is encased in a floppy-like cartridge. Some EO drives use 5¼-inch cartridges that hold between 500MB and 600MB, but a newer generation of drives uses 3½-inch cartridges that hold about 128MB. These drives are faster than their more-ample cousins. Drives storing 500MB to 600MB cost in the \$4000 to \$6000 ballpark; 128MB EO drives cost about half that. Most major hard drive vendors sell EO drives, using mechanisms built by Sony, Maxtor, Canon, or Ricoh. In *Macworld* Lab tests conducted last year, Sony and Maxtor drives were generally faster than Canon and Ricoh models (see "Optical Outlook," *Macworld*, June 1991).

Then there's the *WORM* drive, short for *write-once, read-many*. A WORM drive is the storage world's equivalent to indelible ink: once something is written to it, it can't be erased. Storing 400MB to 900MB on a cartridge, WORM drives are specialized beasts most often used for storing data that *must not* be altered, such as legal and medical records. Many of today's EO drives can also work as WORM drives.

And finally, there's CD ROM. These cousins to compact discs store 550MB of data that's prerecorded at the factory. You wouldn't use CD ROMs to store your own files, but you might buy commercial CD ROMs and use System 7's file-sharing features to make the contents available on a network. Clip art, fonts, stock photographs, encyclopedias, dictionaries, and other research- and education-oriented CD ROMs are available (see *The Desktop Critic*, *Macworld*, September 1991). CD ROMs' ability to play back digital audio as well as to store data has also made them popular for multimedia (see "Getting Started with Multimedia," *Macworld*, May 1991). CD ROM drives have fallen in price, and generally sell for between \$500 and \$1000.

Other Alternatives

IF YOUR ALTERNATIVE STORAGE NEEDS end with hard drive backup, consider a *tape drive*. These store between 60MB and 600MB on specialized tape cassettes (several formats are available—see "Fast-Forward Storage," *Macworld*, November 1991). Most tape drives sell for less than \$1000, but versatile they're not. You can't use a tape drive for primary storage because tape, unlike a disk, is a *sequential-access* medium. A tape drive must wind through the tape to locate a specific file, while a disk drive's heads can skip around to quickly access any file.

Another alternative for backing up a hard drive is a second hard drive. External hard drives often cost less than the removable-media alternatives I've discussed here, and although they lack the portability and security advantages of removable cartridges, they're fast.

What's ahead? Canon has developed credit card-size WORM storage cards that hold 2MB, and some firms have shown floppies that store up to 20MB. Erasable optical drives are likely to become less expensive and faster—maybe even fast enough for primary storage.

And the cost per megabyte will continue to fall. My first computer had a single floppy disk drive that cost over \$400 and stored about 80K per disk—a cost of about \$72 per megabyte. The Bernoulli cartridges I use today cost about \$2 per megabyte, and SyQuest cartridges cost even less.

Only one thing hasn't changed: I still don't have enough disk space. **m**

See *Where to Buy* for contact information.

Contributing editor JIM HEID looks at a different aspect of Mac fundamentals each month. His latest book, *Macworld Complete Mac Handbook* (IDG Books Worldwide, 1991), is an updated and expanded collection of more than 40 *Getting Started* columns.

FOR BETTER CODE IN LESS TIME, ALL YOU HAVE TO DO IS THINK.

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Insights

BY LON POOLE

Hints for Tapping System 7's Power

To appreciate the power of System 7, you need to get beyond the beginner level. These hints will help you do that by covering a few basics and detailing some more advanced techniques. Read on, then explore and experiment to see what else you can discover and invent.

Hide Windows to Boost Performance

With several programs open, you can spend lots of time waiting for inactive programs to redraw portions of their windows as dialog boxes in the active program come and go. This delay is particularly protracted when using virtual memory, because the window redrawing may require disk access. Eliminate all the delay by choosing Hide Others from the Application menu—hidden windows don't require updating. To hide the active program's windows when switching to another open program, press the option key while choosing the other program from the Application menu in the upper-right corner of the screen.

Edit, Don't Open

Inadvertently opening icons when you mean to edit their names can be aggravating. Try setting a briefer Double-Click Speed in the Mouse control panel. You must wait the duration of whatever double-click

interval has been set in the Mouse control panel (1.6, 1.0, or 0.7 seconds) after selecting an icon name before you can select an insertion point (by clicking), a word (by double-clicking), or a range of text (by dragging) in the name. If you click again too soon, the Finder thinks you're double-clicking the icon and opens it.

Cataloging Items on Removable Disks

Do you have trouble finding items on floppy disks, CD

ROMs, and removable hard drive cartridges that aren't mounted on the desktop? You can use aliases to locate and open these offline items quickly. Here's how. Lock the floppy disk or other removable medium, insert it, and make aliases of the items you want to catalog. A message tells you the removable disk is locked and asks whether you want the aliases to be created on the desktop; click OK. To keep the desktop free of clutter, you can move the aliases to a folder. Now when you need an item

from a removable disk, just double-click the alias you made for it. The Finder tells you the name of the disk to insert so it can open the alias's original item. If you change your mind or can't find the needed disk, there's a Cancel button in the dialog box.

Abridged System Folder

Does finding the Apple Menu Items folder, Startup Items folder, or some other item in your System Folder take too long? Make aliases for the System Folder items you access often—including an alias of the System Folder itself—and consolidate the aliases in a new folder. You can open and find an item in that folder faster than in the System Folder, since the folder of aliases is not as cluttered. To make the new folder look like a System Folder, copy the icon from the System Folder's info window and paste it into the new folder's info window.

Favorite Folders

Putting aliases of your favorite folders on the desktop allows you to quickly open them from a directory dialog box. Instead of working your way down through one branch of your folder structure and then working your way up another branch to the folder you want, click the Desktop button and at

Fixing Custom Color Icons

When you paste a color picture into an item's info window, you don't always get what you expect. The Finder sometimes creates an incomplete mask (1). To fix this, launch ResEdit 2.1 and open the item you want to correct. Double-click the icl4 resource. Double-click the icon to get a set of editing tools and a panel in which you can edit the icon pixel by pixel. Then drag the icl4 icon or the icl8 icon over the large Mask icon (2). This creates a better mask that you can edit with the pencil or other tools. To check the new mask, alternately click the icl4 icon and the large Mask icon. Use a parallel procedure to make a new small mask from the ics4 icon. Finally, close all the windows or quit ResEdit and save your changes. To see the finished product, restart the Mac (3).



1



2



3

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HOW TO / INSIGHTS

the desktop level open the alias of the folder you want. It's as if you could jump from one branch of a tree to the roots and then to another branch without crawling up the trunk again.

If you find yourself frequently going back and forth between two folders, just put an alias of each folder in the other. You can then go from one to the other in a single step.

Removing Alias

The name the Finder constructs for an alias can be so long you won't be able to see it all in a list view (such as by name). To quickly remove the word *alias* and shorten the file name, first select the icon name for editing by clicking the name or by clicking the icon and pressing the enter or return key. Then press the right arrow or the down arrow to move the

insertion point to the end of the name, and press the delete key six times.

A second method works on the desktop or in a window viewed by icon or small icon, where you can see the whole icon name. Click the name once to select it for editing, pause briefly, double-click the last word of the name, and press the delete key twice. If you double-click too quickly after selecting the name, the Finder opens the alias instead of selecting the last word of the name (see the tip "Edit, Don't Open").

Folder Size Slowdown

The Calculate Folder Sizes option in the Views control panel can slow down the Mac when you're sharing someone else's files or accessing a file server. If you notice the network activity indicator flashing in the

continues

System 7 Step-Savers

Choosing Finder Shortcuts from the Finder's Help menu reveals more than two dozen keyboard shortcuts that go beyond the \mathbb{A} -key shortcuts listed in the Finder's menus.

Objective	Action
Switch to another open program and hide the current program's windows	Press option while clicking another program's window, choosing from the Application menu, or clicking the desktop
Expand the active window's entire outline (all folders)	Press \mathbb{A} -A and then press \mathbb{A} -option-right arrow
Collapse the active window's entire outline (all folders)	Press \mathbb{A} -A and then press \mathbb{A} -option-left arrow
Erase the floppy disk you're inserting	Press \mathbb{A} -option-tab at disk insert
Bypass the internal hard disk during start-up	Press delete-option- \mathbb{A} -shift
Force the active program to quit	Press \mathbb{A} -option-escape

Some Finder shortcuts also work in the directory dialog boxes you get when you use Open, Save, and other disk-related commands.

Objective	Action
Move from the name-entry box to the directory list and vice versa (in a Save dialog)	Press tab
Select an item to open	Type item's full or partial name
Open the selected item	Press \mathbb{A} -down arrow
Open the enclosing folder or disk	Press \mathbb{A} -up arrow or double-click
Go to the next disk or volume	Press \mathbb{A} -left arrow
Go to the previous disk or volume	Press \mathbb{A} -right arrow
Go to the desktop	Press \mathbb{A} -D or \mathbb{A} -shift-up arrow
Go to the original of the selected alias (instead of opening it)	Press option while clicking the Open button or while double-clicking the alias
Cancel the directory dialog box	Press escape or \mathbb{A} -Period (.)

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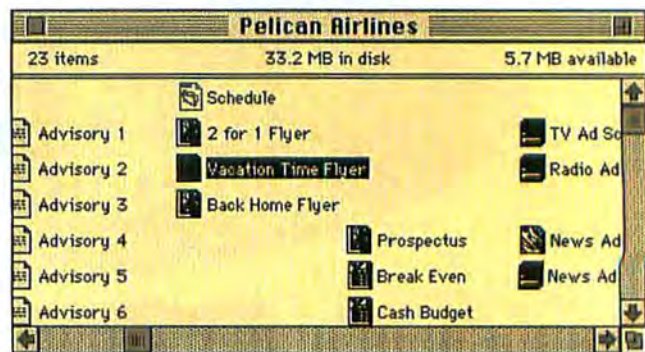
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Find in Next Window Sometimes the Finder's Find Next command gets you bogged down in a window that contains many matches to what you specified in the Find command, but you know the window doesn't contain the item you want. To cancel searching in the active window and skip to the next folder that contains a match, close the window by clicking the close box or pressing ⌘-W. Then press ⌘-G to find again.

left corner of the menu bar and you're not actively using a shared item, the Finder may be getting folder sizes for volumes belonging to another Mac. (The Finder will even do this in the background while you work with another program.) To end the slowdown, either close the shared item's windows or turn off the Calculate Folder Sizes option.

Puzzle Pictures

The Puzzle desk accessory has two games, one in which you unscramble numbered tiles and another in which you unscramble a picture of the Apple logo or a pasted image you can add yourself. Choose Clear from the Edit menu to switch between them. You can replace the picture of the Apple logo by copying a picture in another program, switching to the Puzzle, and pasting.

Trash Everywhere

Are your Trash and hard drive icons inevitably covered by windows of other open programs? What a mess! Make aliases of the Trash and hard drive, put the aliases in a folder, and put the folder in your Apple menu for instant access. Leave that folder open, and its window will come to the front along with the other Finder windows when you select it from the Apple menu. If you're lucky enough to have two monitors, put a Trash alias on

the second monitor and you can use it just as you would the Trash. Beats dragging icons across two screens to throw them away.

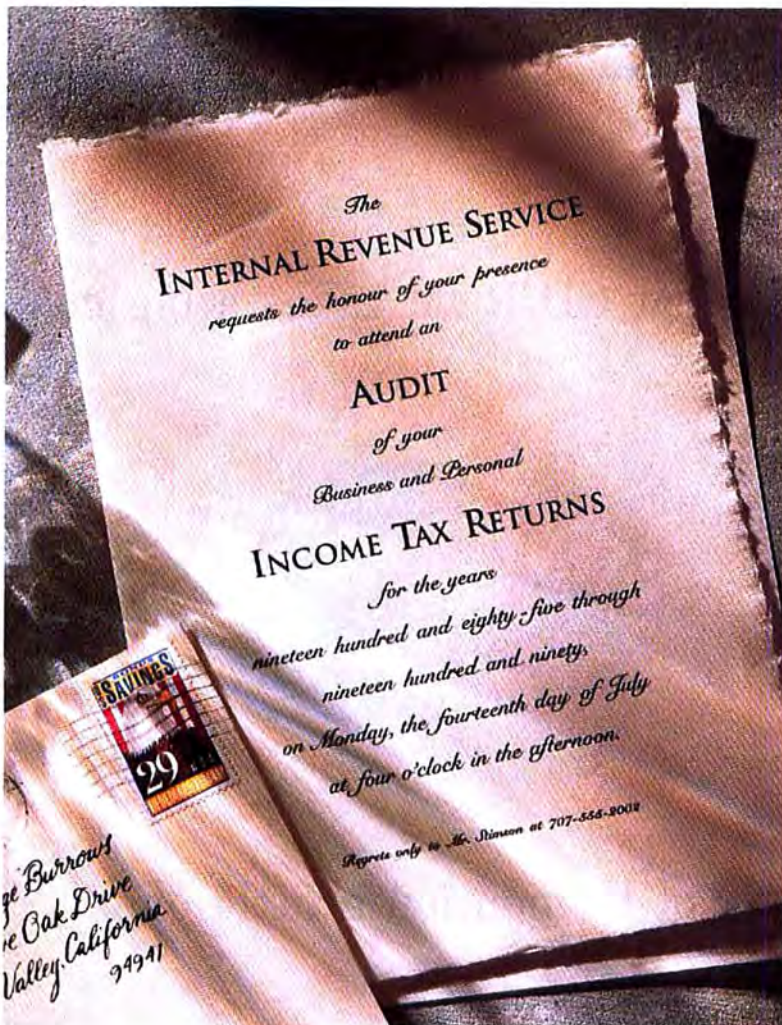
Secret Messages

Apple's system software engineers, true to their kind, have left a few Easter eggs in their work. For example, if you erase all text in the Labels control panel and restart, the Labels menu lists two names, presumably the authors. On a Mac that can run virtual memory, open the Memory control panel, turn on virtual memory, and press the option key while clicking the Hard Disk pop-up menu. Instead of a list of disks, you see the names of virtual memory's creators, along with some interesting "liner notes."

If your Mac can use the Monitors control panel, click on the version number in the upper right corner to see a smiley face and the authors' names. Repeatedly press the option key while holding the mouse button down to mix up the first names and randomly replace them with the words *Blue* and *Meanies*. (Blue Meanies are software engineers who work on system software as a whole, not solely on one aspect of it.) **m**

Contributing editor LON POOLE is the author of *Macworld Guide to System 7* (IDG Books Worldwide, 1991) and *Amazing Mac Facts* (Microsoft Press, 1991).

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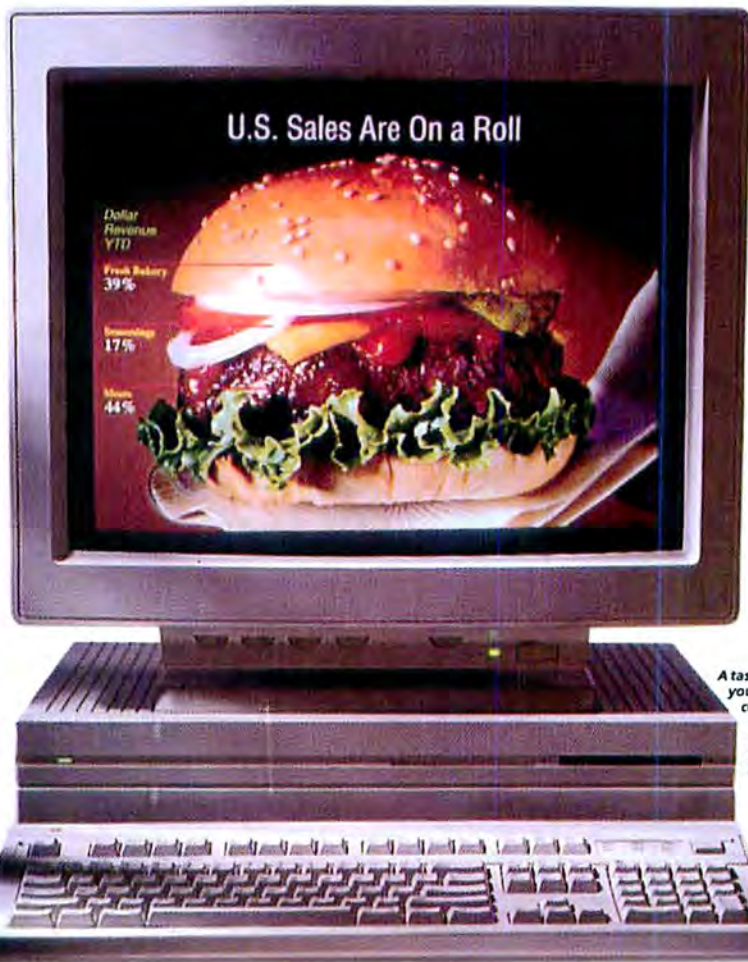
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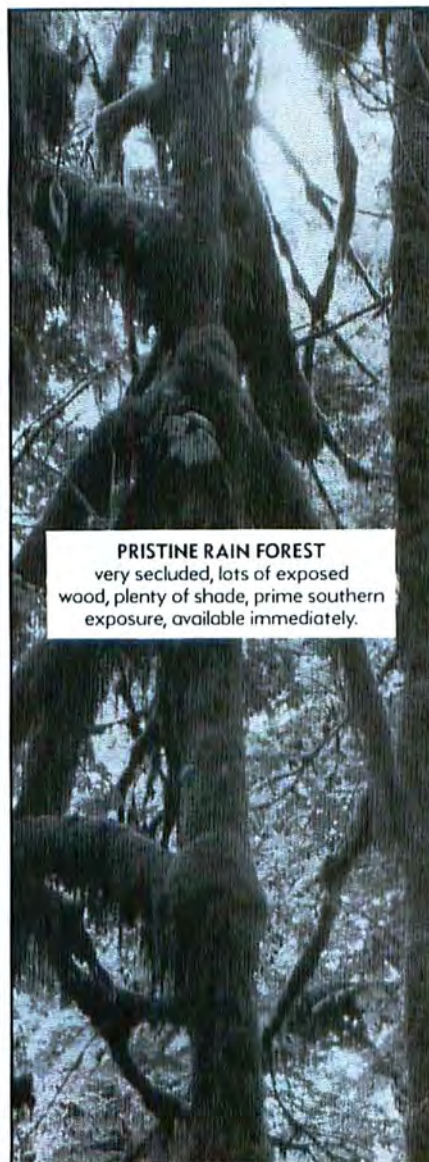
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Francisco Chronicle
Sculley as Quirky Loner—Source: New York
Times
Top Ten Legal Actions illustrations—Ward
Schumaker
Toshiba ad—Source: Toshiba America

Page 229

Computer layoffs chart: Arne Hurty
Silicon Bully—Business Month/Inc. Magazine
Nathan Schulhof—Drake Sorey
Sculley with PowerBook—AP/Wide World
Siskel & Ebert interview—Source: Playboy
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IBM-Tainted Apple cartoon—Source: Oakland
Tribune
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Journal/Permission Cartoon Features
Syndicate
Dennis the Menace—Source: Hank Ketcham
and © North America Syndicate

Page 230

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Customer Support illustration: Ward Schu-
maker
Just Plain Bugs photo—Rosemary Wilton
Monkey at Jasmine booth—Gerry Gropp
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Page 231

Sculley in Japan—AP/Wide World
System 7 brochure—Source: Apple Computer
Stock Sellers chart—Arne Hurty
Kahn on motorcycle—Torin Boyd (for
US News & World Report)
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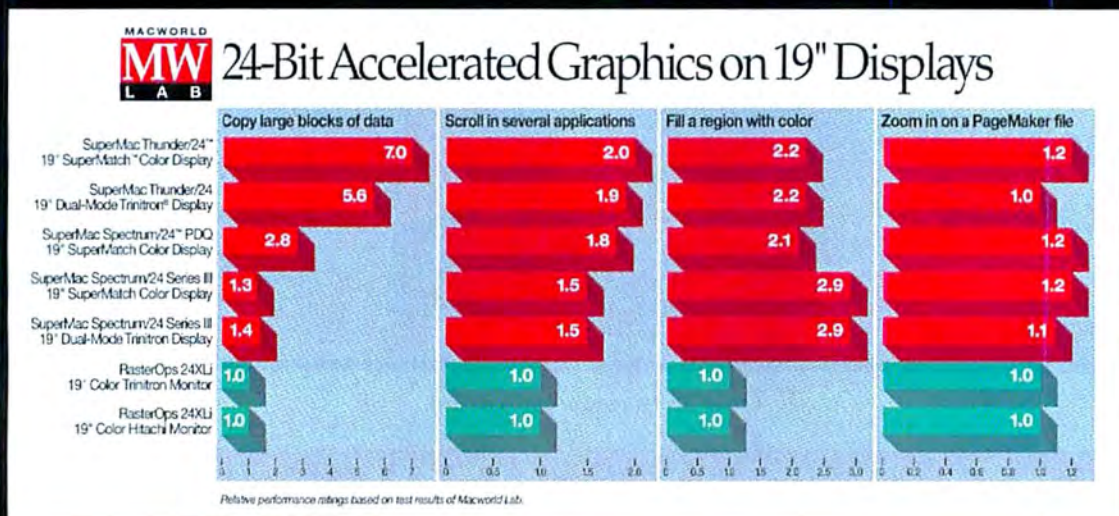
Page 232

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Microsoft threats—Source: InfoWorld
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Press Release Euphemisms—Source: Apple
Computer
System 7 article—Time Magazine, San Fran-
cisco Chronicle, San Jose Mercury News

Page 233

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425 MB	3.5" 5 yr warr., 200,000 MTBF*, 9ms Access	\$1248	\$1348
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Q 120 MB 3.5".....	\$448	\$548
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Q 210 MB 3.5".....	\$688	\$748
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- 14" NEC Color\$438
- 14" Sony Trinitron.....\$498

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The Sony 1320 is plug compatible with the LC.

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- ☐ Education
- ☐ Government
- ☐ Consultant
- ☐ Transportation
- ☐ Information services
- ☐ Utilities
- ☐ Engineering
- ☐ Health services
- ☐ Other (specify) _____

Your Title

- ☐ 16. CEO/president/owner
- ☐ 17. DP/MIS manager
- ☐ 18. Manager/department head
- ☐ 19. Network manager
- ☐ 20. Programmer/analyst
- ☐ 21. Engineer/R&D
- ☐ 22. Consultant
- ☐ 23. Marketing/sales
- ☐ 24. Educator
- ☐ 25. Art director/graphics
- ☐ 26. Editor/writer
- ☐ 27. Other (specify) _____

Organization Size (number of international and national employees)

- ☐ 28. Under 50
- ☐ 29. 50-99
- ☐ 30. 100-499
- ☐ 31. 500-999
- ☐ 32. 1,000-5,000
- ☐ 33. Over 5,000

What multimedia platforms are most applicable?

- ☐ 34. Macintosh
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- ☐ 36. UNIX
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- ☐ 40. None
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11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50

51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100

101 102 103 104 105 106 107 108 109 110
111 112 113 114 115 116 117 118 119 120
121 122 123 124 125 126 127 128 129 130
131 132 133 134 135 136 137 138 139 140
141 142 143 144 145 146 147 148 149 150

151 152 153 154 155 156 157 158 159 160
161 162 163 164 165 166 167 168 169 170
171 172 173 174 175 176 177 178 179 180
181 182 183 184 185 186 187 188 189 190
191 192 193 194 195 196 197 198 199 200

201 202 203 204 205 206 207 208 209 210
211 212 213 214 215 216 217 218 219 220
221 222 223 224 225 226 227 228 229 230
231 232 233 234 235 236 237 238 239 240
241 242 243 244 245 246 247 248 249 250

251 252 253 254 255 256 257 258 259 260
261 262 263 264 265 266 267 268 269 270
271 272 273 274 275 276 277 278 279 280
281 282 283 284 285 286 287 288 289 290
291 292 293 294 295 296 297 298 299 300

301 302 303 304 305 306 307 308 309 310
311 312 313 314 315 316 317 318 319 320
321 322 323 324 325 326 327 328 329 330
331 332 333 334 335 336 337 338 339 340
341 342 343 344 345 346 347 348 349 350

351 352 353 354 355 356 357 358 359 360
361 362 363 364 365 366 367 368 369 370
371 372 373 374 375 376 377 378 379 380
381 382 383 384 385 386 387 388 389 390
391 392 393 394 395 396 397 398 399 400

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411 412 413 414 415 416 417 418 419 420
421 422 423 424 425 426 427 428 429 430
431 432 433 434 435 436 437 438 439 440
441 442 443 444 445 446 447 448 449 450

451 452 453 454 455 456 457 458 459 460
461 462 463 464 465 466 467 468 469 470
471 472 473 474 475 476 477 478 479 480
481 482 483 484 485 486 487 488 489 490
491 492 493 494 495 496 497 498 499 500

501 502 503 504 505 506 507 508 509 510
511 512 513 514 515 516 517 518 519 520
521 522 523 524 525 526 527 528 529 530
531 532 533 534 535 536 537 538 539 540
541 542 543 544 545 546 547 548 549 550

551 552 553 554 555 556 557 558 559 560
561 562 563 564 565 566 567 568 569 570
571 572 573 574 575 576 577 578 579 580
581 582 583 584 585 586 587 588 589 590
591 592 593 594 595 596 597 598 599 600

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Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.
SOFTWARE			PERSONAL BUSINESS/HOME			DIGITIZERS/SCANNERS			TRAINING		
BUSINESS			253 XChange			18-19 Caere Corporation			60-61 MacAcademy		
66	AEC Software	83	303	Chipsoft	—	330	Calcomp	3/133	TRADESHOWS/CONFERENCES		
156-157	Beagle Brothers	6	261	Intuit	—	196	Chiron America, Inc.	94	245	Images & Tools Design Conf.	—
18-19	Caere Corporation	73	33	MacFriends	58	338-339	Eastman Kodak	186	337	MacSciTech	64
303	Chipsoft	—	155	MacFriends	109	263	Nikon	67	310-311	Macworld Expo	—
207	Computer Associates	10	72	MacFriends	258	DISPLAY			344-347	Media '92	—
151	Data Desk	95	ENTERTAINMENT			411	Aura Systems	120	ACCESSORIES		
67	Frame Technologies	60	36	Computeach	168	5	E-Machines	303	FURNITURE		
8	Kiwi Software	33	58	Inline Design	111	304	Ehman	2	12	Anthro	—
6-7	Lectus	—	MULTIMEDIA			Mirror Technologies			162	MacTable/Scanco	252
276	Microsoft	—	35	Specular Int'l.	112	68	Mobius Technologies	89	MISCELLANEOUS		
IFC-01	Microsoft	—	324	Strata	293	73	RasterOps	—	22	Avery Dennison Stationary Prod.	53
74-75	Microsoft	—	NETWORKING			275	Sharp	47	306	Avery Dennison Stationary Prod.	108
37	Odesta	238	76	Alisa	—	MODEMS			308	Computalabel	116
322	Peachtree Software	100	307	Insignia Solutions	72	299	Dove Computer	128	MAIL ORDER		
34	Personal Training Systems	44	152E	Teknosys	142	298	Dove Computer	138	358	Advanced Business Center	227
4	PowerUp Software	87	LANGUAGES			285	Hayes Microcomputer	126	378	APS	15
69	Prescience	179	286	Bimillennium	233	186	Logiccode Technology, Inc.	93	380-381	Bottomline	—
198	SoftSync/BLOC	367	329	Symantec	96	194-195	P.S.I.	61	356-357	Bottomline	—
409	Software Publishers of America	97	SECURITY			192	Sierra Semiconductor Corp.	—	362-363	Dr. Mac	—
304	Software Ventures	—	78	Microseeds	228	148-149	Supra Corporation	—	353	Express Direct	1
147	SPSS, Inc.	210	337	Secure-It	239	NETWORKING			355	Express Direct	149
57	Statsoft	99	56	Software Security	107	152	Asante	24	359	Hard Drives International	—
302	T B S P	25	UTILITIES			408	Engage Communication	77	379	Mac and More	85
163	Teleware	76	306	Avery Dennison Stationary Prod.	108	408	NAC	51	79-142	Mac Zone, The	70
VERTICAL			40	Berkeley Systems Design	8	HARD DISKS/STORAGE			314-321	Mac's Place	209
162	Abacus Concepts	50	300	Dantz Development	26	378	APS	15	354	MacBest	98
286	Bimillennium	233	283	Fifth Generation Systems	130	145	Contemporary Cybernetics	188	370-371	MacCenter	—
4	PowerUp Software	87	301	Fifth Generation Systems	135	54	Core Int'l.	215	44-53	MacConnection	—
302	T B S P	25	325	Fifth Generation Systems	151	361	DGR Technologies	81	360	MacDepot	144
WORD PROCESSING			39	GDT Softworks	42	304	Ehman	2	343	MacDirect	140
156-157	Beagle Brothers	6	8	Kiwi Software	33	359	Hard Drives International	—	366-369	MacLand	40
153	Reference Software	—	154	Microcom, Inc.	41	333	Imega	240	340	MacNews	69
CAD/CAM			64	Salient	39	25-32	La Cie	—	372-373	MacProducts USA	175
13	Design CAD	336	MISCELLANEOUS			343	MacDirect	140	342	Macs Now	171
300	Engineered Software	12	39	GDT Softworks	42	366-369	MacLand	40	376-377	MacSource	48
152	Graphsoft	46	HARDWARE			372-373	MacProducts USA	175	374-375	MacTech Technologies	105
42	Mathsoft, Inc.	34	COMPUTER SYSTEMS			190	Mass Microsystems, Inc.	207	200-206	Macwarehouse	270
CD ROM			380-381	BottomLine	—	259	MicroNet Technology	113	412	Printer Connection	—
188	CD Technology	102	356-357	BottomLine	—	281	Microtech Int'l.	80	16	Quark	295
410	D'Pix	261	353	Express Direct	1	VIDEO			352	Tass Optical World, Inc.	211
296	NEC	124	354	MacBest	98	161	Mirror Technologies	125	364-365	Thirdwave	156
409	Quantum Leap Technologies	136	33	MacFriends	58	415	O.C.E.A.N. Microsystems	131	EXPANSIONS/UPGRADES		
411	Quantum Leap Technologies	137	155	MacFriends	109	14-15	Pinnacle Micro	266	411	Aura Systems	120
COMMUNICATION			72	MacFriends	258	352	Tass Optical World, Inc.	211	279	Microtech Int'l.	127
76	Alisa	—	376-377	MacSource	48	INPUT DEVICES			313	New Life Computer Corp.	294
288	Dataviz	36	374-375	MacTel Technologies	105	20	Curtis Manufacturing	20	194-195	P.S.I.	61
304	Software Ventures	—	59	Outbound Systems	30	MISCELLANEOUS			ON-LINE SERVICES		
EDUCATIONAL			16	Quark	295	361	DGR Technologies	81	290	Compuserve	319
342	Educational Resources	28	PRINTERS			409	Environmental Services	141			
413	Learning Adventure Computer Club	121	65	Canon USA	164	332	James Burn Int'l.	134			
34	Personal Training Systems	44	355	Express Direct	149	BOARDS					
69	Prescience	179	254-255	Hewlett Packard	—	313	New Life Computer Corp.	294			
Fonts			70-71	LaserMaster Corporation	182	38	Radius	178			
150	Casady & Greene	32	340	MacNews	69	43	Supernac	88			
41	Image Club	—	309	Microtek Labs, Inc.	63	341	Supernac	132			
77	Postcraft International	200	159	NewGen Systems, Inc.	74/75	CD ROM					
GRAPHICS/DTP			10-11	Seiko Instruments	—	188	CD Technology	102			
312	Allsys	35	327	Tektronix	143	336	NEC Technologies	—			
158	Calliscopa	82	184	Texas Instruments	313						
410	D'pix	261	BOARDS								
9	Daniba Software	57	313	New Life Computer Corp.	294						
332	Digital Vision	242	38	Radius	178						
67	Frame	60	43	Supernac	88						
41	Image Club	—	341	Supernac	132						
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295	Timeworks	206									

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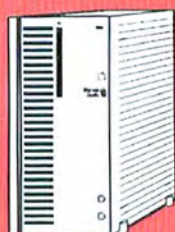


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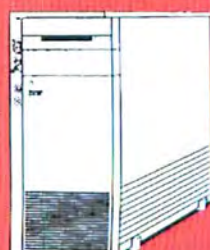
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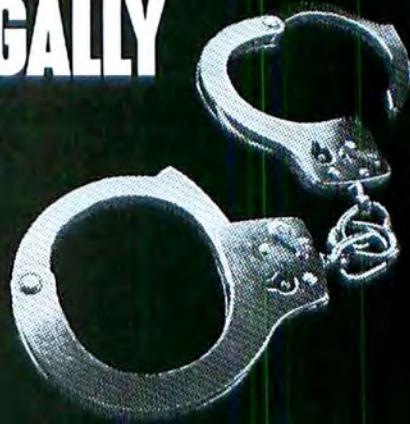
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ASD

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AVERY

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PERSONALITY	58

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AFTER DARK	28
MORE AFTER DARK	28
AFTER DARK/MORE AFTER DARK BDL	48

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QUICKKEYS 2.2.1	92
TILES	62

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SALIENT

DISK DOUBLER	46
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SERIOUS DEVELOPER	349
SERIOUS PROGRAMMER	209

SOFTWARE COMPATIBILITY

SOFTWARE BRIDGE	59
-----------------	----

SYMANTEC

NORTON UTILITIES 1.1	86
SAM 3.0	63
SUM II	96
THINK C 5.0	196

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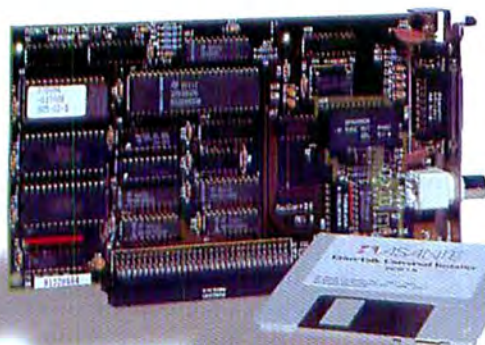
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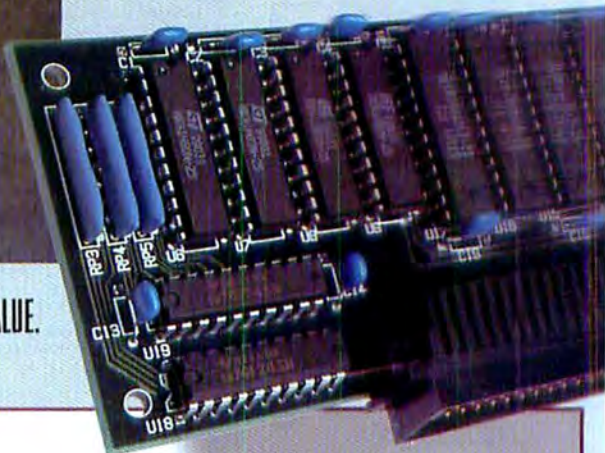
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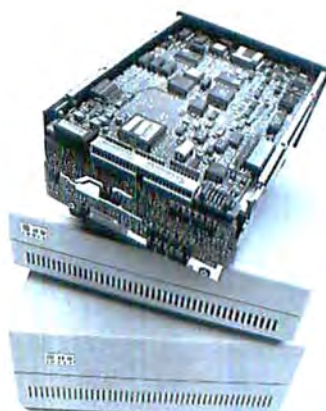
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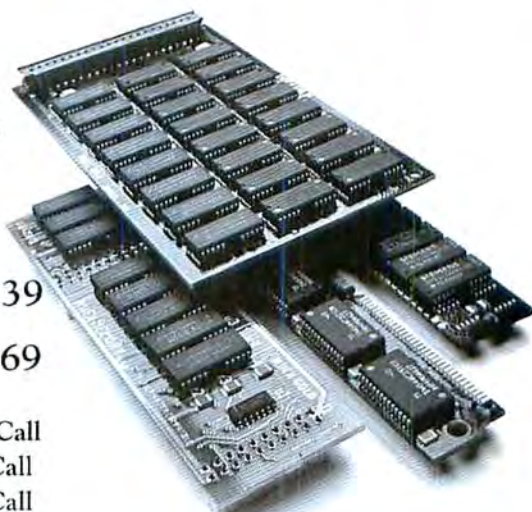
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Norton Utilities Mac 1.1	74
Omnis 5 Single User	566
OmniPage 3.0	459
Passport Encore	335
Passport Midi Interface	63
Patton Strikes Back	33
PixelPaint Professional 2.0	479
PGA Golf	34
Renderman	559
Quark XPress 3.1	511
Quick Keys II V.2.1	87
Quicken 3.0	38
Retrospect	131

Sim City	27
Sim City Supreme	44
Sim Earth	38
Sim Ant	32
Soft PC 2.5	178
Soft AT	279
Soft PC 2.5 Classic/LC	117
Stratavision 3D 2.0	579
Studio/32	399

TI Accessories

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Envelope Feeder.....	\$244
Paper Feeder Drawer.....	\$244

Stuffit Deluxe 3	48
SUM II	87
SAM 3.0	58
Swamp Gas	24
Swivel 3D Pro	399
System 7.0	85
Tesseract	25
Tetris	23
Think C	153
Think Pascal 3.0	159
TOPS 3.1 Network Bundle	172
Typesetter 2.0	122
Ultra Paint	115
Vellum 2.0	1399
Vette	32
Virex	46
Wealth Builder	129
White Knight	75
WordPerfect 2.03	265
Write Now 2.0	111
Weltris	23

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SIGHED, "WHILEY, WHAT A HEAVY THOUGHT!" SAM'S A MAN ABLE TO CARRY THE WEIGHT OF HIS OWN MIND. HE HAD BEEN PONDERING THE EFFECTS OF MOUNTING BRACKETS ON MAN IN THE MOON.

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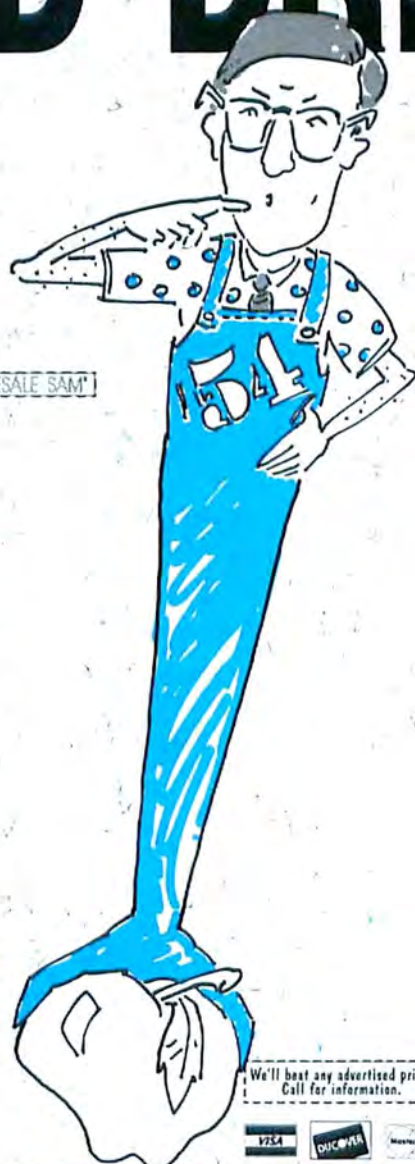
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Billboard Advertisers Index

MacOutlet Peripherals 800.622.6885	384
oftshoppe Public Domain Software 800.829.BEST	384
eviathan Entertainment 800.252.5029	384
am Software Networking 800.630.0055	385
Computation Networking 814.238.2120	385
Bible Research Religion 800.423.1228	385
Microspot Utilities 800.622.7568	385

Catalog Product Index

Hardware

Bar Code	386
CD-ROM	386
Computer Systems	386
Disk Drives	389
Memory Upgrade	389
Peripherals	392
Power Protection	394
Printers	394

Software

Astrology	395
Bar Code	395
Business	395
CAD/CAM	395
Clip Art	396
Communications	397
Dental	397

Educational	397
Engineering	398
Entertainment	398
Fonts	400
Genealogy	400
Graphics	400
Graphic Translators	400
Hyper Card Stacks	401
Import/Export	401
Languages	401
Legal	401
Medical	401
Music/MIDI	401
Nutrition	402
Programming Tools	402
Property Management	402
Public Domain	403
Religion	403
Sales/Marketing	403
Scientific	403

Statistics	403
Training	403

Services

Computer Insurance	403
Computer Repair	404
Data Conversion	404
Data Recovery	404
Desktop Publishing	404
Laser Recharge	404

Accessories

Cases	405
Diskettes	405
Furniture	406
Supplies	406

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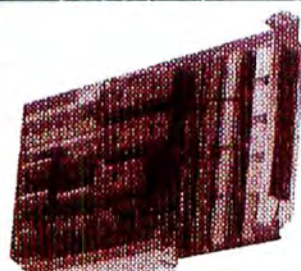
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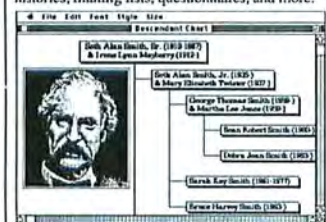
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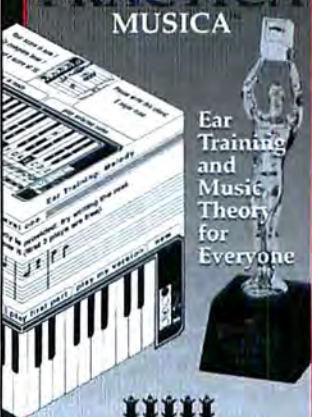


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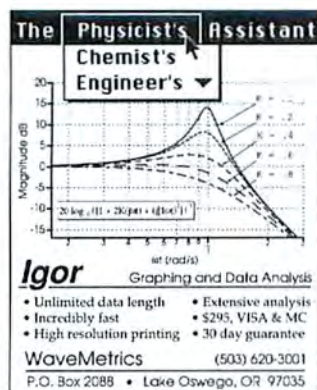
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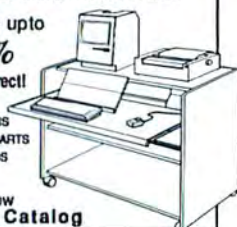
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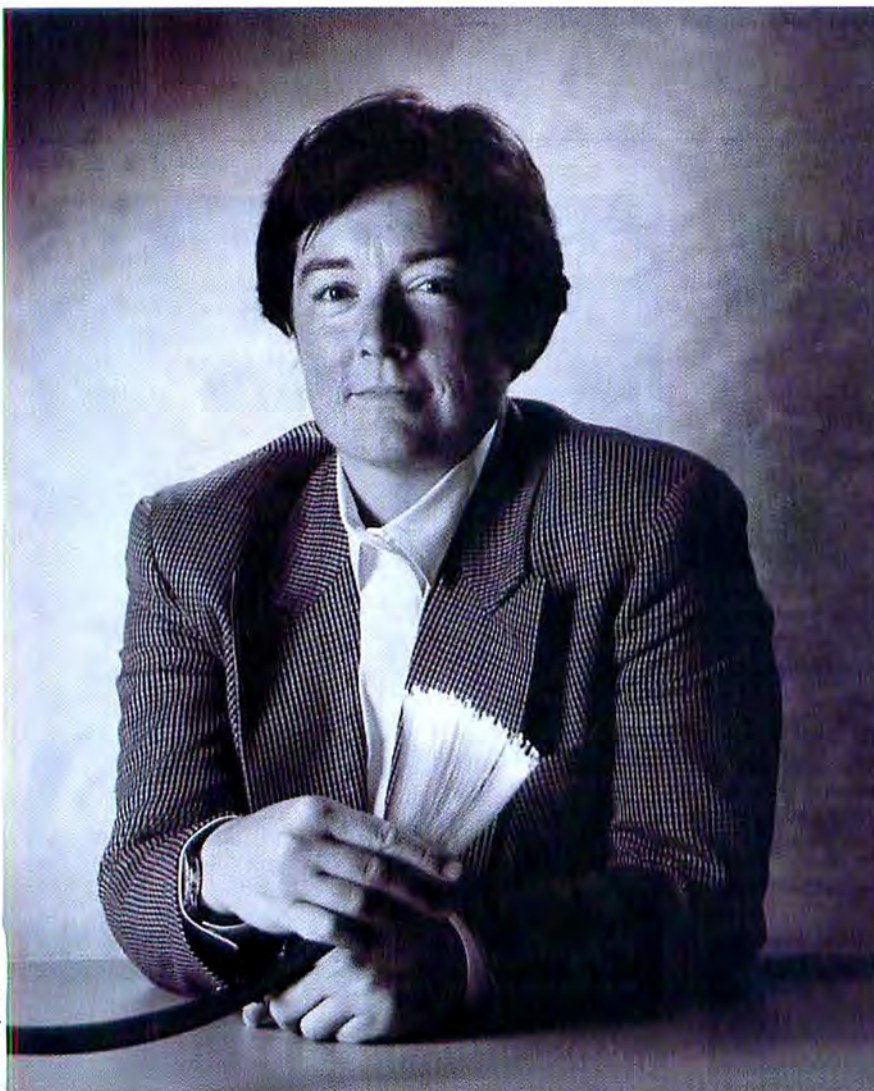
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MACWORLD February 1992 411

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Mac IIfx - 5 meg	4179
Mac IIfx - 5 meg	2950
Mac IIfx - 5/105 (Quantum)	3359
Mac IIsi - 3/40	2625
Mac Portable 2/40	2650
Mac Portable 4/40	2880
Extended Keyboard	175
Quadra System	Call
Power books	Call

MONITORS

IKegami	
CT20 Color Trinitron	
& CT 2010 Mono	1845/825
CT20 w/8 Bit Card	2399
CT20 w/24 Bit Card	3049

Radius

19" Color Display	2950
21" Color Display	3125

Color Pivot

Color Pivot Interface	1249
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II, LC, IIsi, SE, SE/30

Full Page System for Classic	825
Full Page System for LC	885
Full Page System for SE	825
Pivot Display for Built-in Video	729
Two Page Display 19"	959
Two Page Display 21"	1230
Two Page Display Interface	399
SE, SE/30, II, IIsi	
Precision 8 interface	515
Precision 24x	1700
Precision 8x	799

Radius

	Price
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Rocket Accelerator

Apple

Apple 13" Highres	649
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Seiko

Seiko CM-1445	569
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SuperMac

Platinum 19" Display	964
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Platinum Two-Page Display	1239
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Super Match 19" Color	1929
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Super Match 21"

Two-Page Color Display	3031
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Trinitron 16" Display	1860
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Dual-Mode Trinitron 19"	2893
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Thunder/8	1259
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Thunder/24	3299
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Spectrum 8.24 PDQ	899
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Magnavox

14" Color Monitor	499
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DRIVES

	Ext.	Internal
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Quantum 105 Pro	469	369
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Quantum 210 Pro	835	710
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Maxtor 120		399
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Maxtor 213		659
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Maxtor 340		1099
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Syquest 44MB		519
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Syquest 88MB		879
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Internal Kit		29
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Syquest 44MB cart.		75
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SOFTWARE

Microsoft Word	269
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Microsoft Excell	309
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Aldus Pagemaker	497
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SOFTWARE (cont.)

	Pric
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Caere Omnipage	49
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Adobe Photoshop 2.0	51
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Quark Express	52
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Adobe Streamline	9
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PRINTERS

Microtek TrueLaser	1399
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TI Microlaser PS35	1519
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TI Microlaser PS17	1219
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HP Deskwriter	439
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HP Deskwriter Color	739
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QMS PS410	1699
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Qume Crystal Print	
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Publisher II	2119
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NEC Mod 90	1579
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Crystal Print Mac Publisher	1689
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HP Deskwriter Ink Cartridge	18
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Appletalk Connectors (Each)	25
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New Apple Laserwriters	Call
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SCANNERS

Logitech ScanMan 32	279
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Microtek 600ZS w/Photoshop	1369
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Microtek 1850S Slide	1895
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Scanner

Caere Typist	420
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MODEMS

Zoom	
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FX9624 Plus 2400 BPS	139
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Modem MX 2400S w/SendFax	
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9600 BPS	105
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v.32 Turbo w/v.42bis	
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Dove Fax Modem 9624+	295
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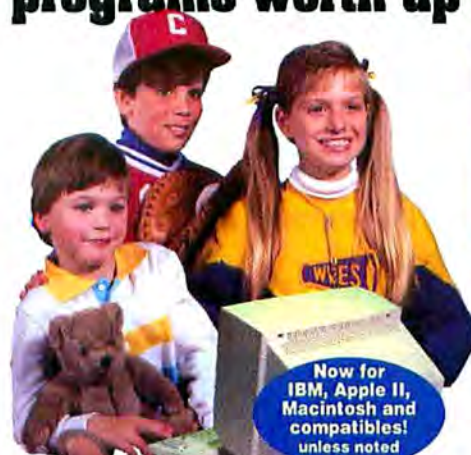


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SOFTWARE SELECTION GUIDE

ages 3-7
ages 7-10
ages 10-13+

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How the Club Operates

Try your first computer program FREE for 15 days at no risk or obligation. Just select the software package of your choice, complete the coupon at right and mail it today!

We'll send you the program you select. If you're pleased with it, you'll pay just \$9.95—the Charter Member's price—plus shipping and handling, a savings of up to \$50.00 off the retail price.

Then about every four weeks (13 times a year) you'll receive our special Club Newsletter with details about the next selection for your child. To receive the main selection, you need to do nothing—it will be sent automatically. If you wish to order an alternate selection, or wish no selection at all, simply return the card we provide to tell us your choice. You will always have at least 10 days to decide.

Enjoy a 15-Day Free Trial

What's more, you have 15 days to preview your introductory software and return it if not 100% satisfied. As a member, your only commitment is to purchase three additional selections in the next year at regular club prices. You may cancel your membership anytime thereafter. You have absolutely nothing to lose, and a whole new world of fun and learning to gain for your children. So don't wait. **Mail the coupon today!**

Circle 121 on reader service card

Exciting Newsletter...FREE!

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Mail to: **Learning Adventure™ Computer Club**
925 Oak Street, Scranton, PA 18515, Dept. AFYA12

YES! Please send me the program I have indicated below to preview for 15 days at no risk or obligation. I may return the program after 15 days and have no further obligation. If I am pleased with the program, I'll pay for it at the special new member price of only \$9.95 plus shipping and handling, and enroll as a new member under the terms outlined on this page. As a new member, I need to buy just 3 more selections at regular club prices in the next year and may cancel any time thereafter.

Name _____

Address _____

City _____ State _____ Zip _____

Telephone () _____

Name of Program (Print in box) _____

1. AGE of child (check one): ☐ 3-7 ☐ 7-10 ☐ 10-13+

2. Computer you own and disk size required (check one):

- ☐ IBM/Tandy & compatibles with 5.25" disk drive
- ☐ IBM/Tandy & compatibles with 3.5" disk drive
- ☐ Apple II family & compatibles with 5.25" disk drive
- ☐ Macintosh & compatibles with 3.5" disk drive

3. Child's name _____

Child's birthdate: Month _____ Day _____ Year _____

4. Please check below if you have a:

- ☐ Printer ☐ Modem ☐ Color Monitor

5. Parent's signature _____

We reserve the right to request additional information or reject any application or cancel any membership. Sales tax will be added in PA. We'll send you details of the club's operation with your enrollment shipment and you have a 15-day no-obligation privilege to decide if you wish to continue as a member.

Profile

TRACKING OZONE LOSS

SUSAN SOLOMON KEEPS A CLOSE eye on the Antarctic. In 1986 she led the first U.S. study of Antarctica to examine ozone depletion. Ozone losses had been noted there the year before, an alarming discovery because ozone in the stratosphere protects Earth from the Sun's ultraviolet radiation.

Solomon was among the first researchers to discover the mechanism for ozone depletion, a chemical reaction between ice particles in clouds and chlorine from chlorofluorocarbons used primarily as solvents and in refrigeration. The Chicago native heads the Middle Atmosphere Section at the Aeronomy Laboratory of the National Oceanic and Atmospheric Administration (NOAA) in Boulder, Colorado.

"I use my Mac extensively; it's part of my life," says the award-winning scientist, who specializes in the photochemistry of the stratosphere. The NOAA uses Macs to collect, analyze, and share data. Four Macs (two II's and two Ix's) are being connected directly to spectrometers to collect light samples that give scientists information about ozone loss. One Mac is already set up in Antarctica; the others are earmarked for Hawaii, Colorado, and New Zealand. Once data is collected and analyzed using a custom program, Solomon uses Igor, from Wave Metrics, and CA-Cricket Graph to plot results. For serious modeling, she uses her Mac as a front end to a Cray supercomputer, later studying the results on her own machine.

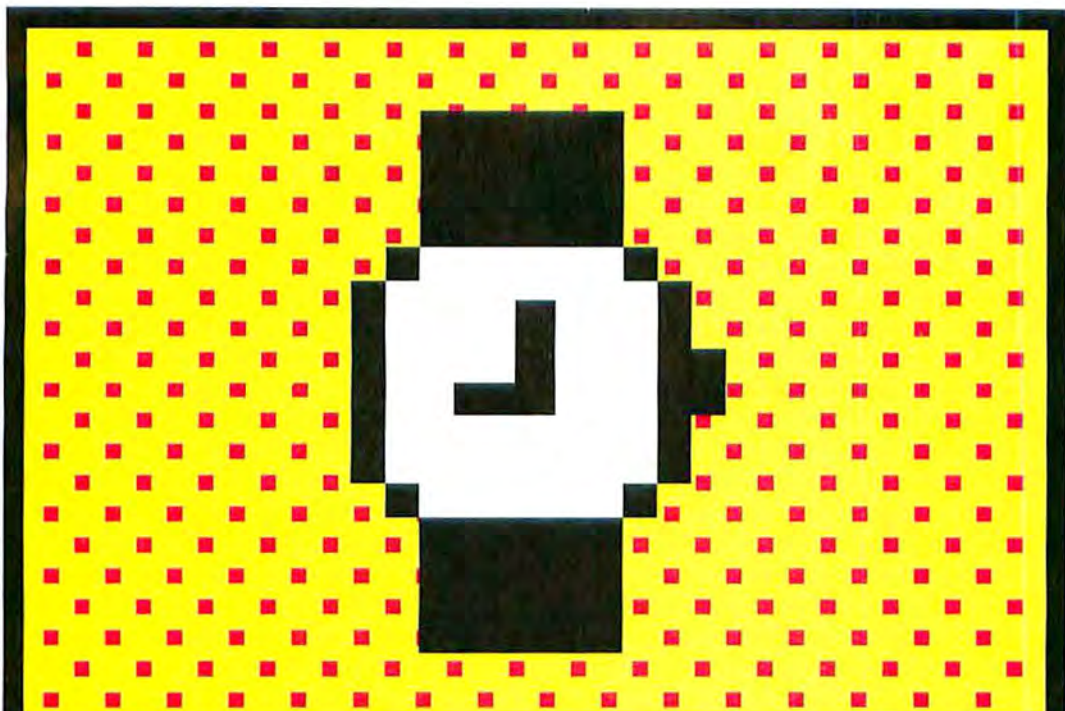
The urgency of the ozone issue is undeniable. Last October a United Nations study reported that ozone thinning isn't limited to the Antarctic nor to winter months. But research is paying off. Partly as a result of Solomon's work, more than 70 nations have agreed to lower the use of ozone-destroying chemicals by the year 2000.

—DEBORAH BRANSCUM



Susan Solomon, Ph.D.

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
BOULDER, COLORADO



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Or write to us at 800 West Cummings Park, Suite 2050, Woburn, MA 01801.

And stop looking at your watch.



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Circle 56 on reader service card

Best-Sellers

FEBRUARY 1992

Months on chart
▼ Last month
▼ This month

Business Software

72	1	1	Microsoft Excel <i>Microsoft Corporation</i>
81	2	2	Microsoft Word <i>Microsoft Corporation</i>
3	3	3	Microsoft Office <i>Microsoft Corporation</i>
59	4	4	Microsoft Works <i>Microsoft Corporation</i>
33	5	5	WordPerfect for the Macintosh <i>WordPerfect Corporation</i>
57	9	6	MacDraw II <i>Claris Corporation</i>
1	—	7	Calendar Creator <i>Power Up Software Corporation</i>
68	6	8	Aldus PageMaker <i>Aldus Corporation</i>
19	14	9	Quicken <i>Intuit</i>
33	12	10	FileMaker Pro <i>Claris Corporation</i>
2	8	11	Aldus Persuasion <i>Aldus Corporation</i>
15	7	12	MacProject <i>Claris Corporation</i>
57	11	13	MacWrite II <i>Claris Corporation</i>
16	—	14	Aldus FreeHand <i>Aldus Corporation</i>
3	10	15	Microsoft PowerPoint <i>Microsoft Corporation</i>

Education Software

48	1	1	Reader Rabbit <i>The Learning Company</i>
15	3	2	Where in Time Is Carmen Sandiego? <i>Broderbund Software</i>
34	4	3	Where in the World Is Carmen Sandiego? <i>Broderbund Software</i>
20	—	4	Where in the USA Is Carmen Sandiego? <i>Broderbund Software</i>
59	2	5	Math Blaster <i>Davidson & Associates</i>

Months on chart
▼ Last month
▼ This month

Entertainment Software

46	1	1	Microsoft Flight Simulator <i>Microsoft Corporation</i>
11	2	2	SimEarth <i>Maxis</i>
25	—	3	SimCity <i>Maxis</i>
3	3	4	Bridge <i>Artworx</i>
2	4	5	Olds <i>FTL Games</i>

Network/Data Communications

13	2	1	MacLink Plus <i>DataViz</i>
14	4	2	White Knight <i>FreeSoft</i>
60	5	3	TOPS <i>Sitka Corporation</i>
15	—	4	Timbuktu <i>Farallon Computing</i>
8	—	5	Smartcom II <i>Hayes Microcomputer Products</i>

Add-In Boards

1	—	1	Macintosh IIci Cache Card <i>Apple Computer</i>
10	1	2	Macintosh IIsi NuBus Adapter Card <i>Apple Computer</i>
14	2	3	Macintosh Display Card 8•24 <i>Apple Computer</i>
16	3	4	Radius TPD Interface <i>Radius</i>
3	5	5	Apple IIe Card Macintosh LC <i>Apple Computer</i>

Months on chart
▼ Last month
▼ This month

Utility Software

9	1	1	After Dark <i>Berkeley Systems</i>
16	2	2	The Norton Utilities for the Macintosh <i>Symantec Corporation</i>
1	—	3	More After Dark <i>Berkeley Systems</i>
2	4	4	Suitcase II <i>Fifth Generation Systems</i>
10	5	5	Virex <i>Microcom</i>

The AmCoEx Index of Used Mac Prices

Machine/ RAM/Hard Drive	Average Sale Price	Monthly Change
Mac Plus/1MB/none	\$550	+75
Mac Plus/2MB/20MB	\$800	-25
Mac SE/2MB/20MB	\$1000	+25
Mac Portable/1MB/40MB	\$1600	-50
Mac Classic/2MB/40MB	\$1075	+50
Mac SE/30/2MB/40MB	\$2150	+350
Mac II/4MB/40MB	\$1950	-100
Mac IIcx/4MB/40MB	\$1950	-100
Mac IId/4MB/40MB	\$1950	-100
Mac IIfx/4MB/80MB	\$4500	-200
Apple 12-inch B&W display/board	\$300	-25
Apple 13-inch RGB display/board	\$700	0
LaserWriter Plus	\$1300	-100
LaserWriter IINT	\$1900	0

Index is provided by the American Computer Exchange of Atlanta, Georgia. It reflects sales during week of November 22. Configurations include keyboard and exclude monitor and display board for noncompact models.

Source: Exclusive Audits & Surveys research from more than 250 Macintosh retailers and selected mail-order vendors. Covers sales during October 1991.

"Don Says Mirror's New Monochrome Displays Are Clearly Their Best Product..."

*Don Rittner, President of M.E.C.C.A.
Editor of MUG News Service*

\$449 for built in video
(call for other options)



19" \$799 with card.
21" \$999 with card.



es He Know?"

Members of
Macintosh Enthusiasts Club
of the Capitol Area

issue of MacUser magazine. Featuring world class Trinitron quality so your most critical projects look flawless, the ProViews are still affordably priced.

"The ProView can handle my most demanding applications with ease; and best of all, I can afford it."

— Michael Levy



mice, saying, "the quality of the hardware is excellent." and it "produced the best images."

If you need to get color or gray-scale images into your work, the Mirror color scanner is for you.

"Mirror's 88MB SyQuest drive solved my growing storage problem."

— John H. Galligan

The Mirror color scanner, according to Nancy, is a remarkable product; 600 dpi 24-bit scanning for only \$1299. It has more features and higher quality than competing models, yet is priced far less.

"This would be a good scanner for \$2000; for \$1299 it's unbelievable."

— Nancy M. Benz



In December 1991 MacUser gave this scanner 4

Nancy M. Benz, member



Mirror offers hard drives from 30 MB to 1 Gigabyte, and each one has the quality features that won John over:

top quality drive mechanisms, rugged steel chassis, external termination and SCSI address switch, convenience outlets and a two year warranty.

Whether you need a zero-

HARD DRIVES	EXT.	INT.
45MB	\$329	\$269
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80MB	\$369	\$299
105MB(Q)	\$499	\$439
210MB(Q)	\$799	\$739
45MB Rem.*	\$499	N/A
88MB Rem.*	\$649	N/A
CD ROM	\$599	N/A

Call for other capacities.

*Price Includes one cartridge

John H. Galligan, member



footprint drive, a super compact portable drive, or an 88 or 45 MB Syquest drive, Mirror's got the right stuff.

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†Available 2/1/92

Circle 125 on reader service card

...But What Do

At Mirror, we build quality, reliability and value into every single product so we've got power users all over the country talking about them. It's the kind of talk we love to hear.

"Unarguably the best products in the Mirror line."

— Don Rittner

Don Rittner, president of M.E.C.C.A., thinks that monochrome monitors are Mirror's best products. But members of his own users' group disagree.

It's possible that Don may be right. After all, we've just introduced a new 21" two-page[†] and a 15" full-page display. Use them with a built-in video port on some Macs or with a Mirror monochrome video card for a sharp, bright view of your work.

Stephen C. Frantz, Ph.D., member



The 19" two-page display comes with a monochrome video card for the SE, Classic, LC, SE/30, MacII or Quadra.

All three systems feature high-contrast, razor-sharp images, reduced VLF and ELF emissions, and built in ADB ports for reduced cable clutter.

Stephen Frantz prefers Mirror's color monitors because there's one for every need and budget. Like the 14" for example.



14" Color	\$399*
16" Trinitron	\$1399*
w/ 8-bit card	\$1799
20" Trinitron, 8-bit	\$2499
20" Trinitron, 24-bit	\$2999

* for built in video ports

"Mirror's 14" color is under 400 bucks, and it looks great."

— Stephen C. Frantz

It gives you large screen color for a monochrome price, 640 X 480 resolution for 56% more work-space than Apple's 12" monitor, and brilliant color from

Hilary Koppel, member



the built-in video port of your LC, IIsi, IIfx or Quadra.

"Mirror's done it again. This is a real breakthrough, a 16" Trinitron for \$1399."

— Hilary Koppel

Stephen is not the only one excited about Mirror color systems. Hilary loves the 16" Trinitron. Designed for the pro who demands the highest quality, but can't justify the high cost, the Mirror 16" Display has 832 X 624 resolution for comfortable viewing of two-page layouts or large spreadsheets.

Use Mirror's 16" Trinitron with the built-in video port on IIsi, IIfx or Quadra, or our optional video card for any MacII.

If you need a no compromise two-page color display, Michael advises checking out the Mirror ProView.

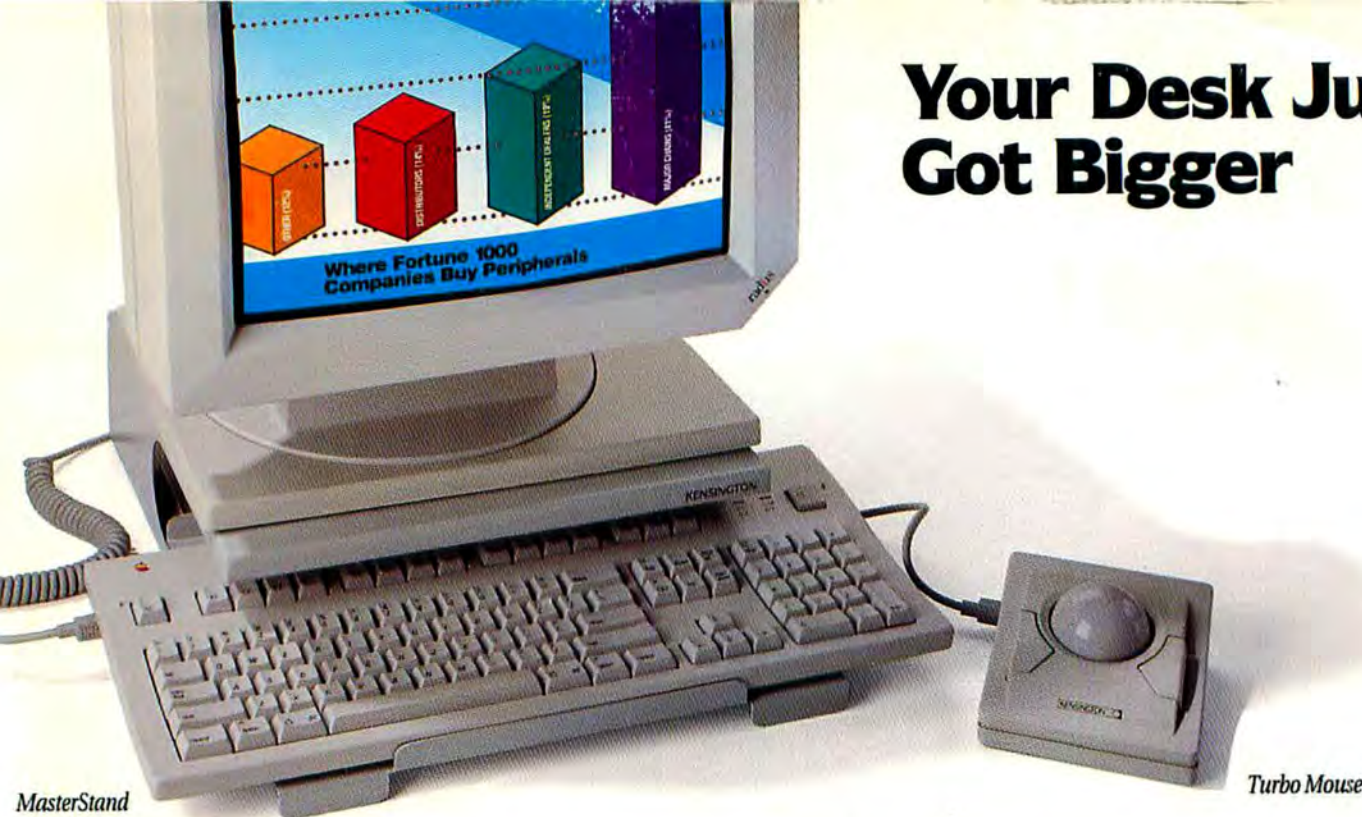


Available in 8-bit or 24-bit models, the ProView is "a real bargain" according to the May '91

Michael Levy, member



Your Desk Just Got Bigger



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Turbo Mouse

Kensington introduces MasterStand and LaserStand to its complete line of space savers.

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Space Saving Printer Stand

And our award winning *Turbo Mouse®* saves even more space with its superior trackball design.

Unlike many accessories, all Kensington products look like they belong to your Mac. The styling is complementary. The color identical. Even the same material is used.

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