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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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.
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 1.0,
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.

280 Earthquest Explores
Ecology
Ecology educational stacks.

280 Gilder 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 2.0.1
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 1.0.1
Format-translation utility.

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 MEID
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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3. **Free Solutions.**
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**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:** MacroMind/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.
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Circle 20 on reader service card
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 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 I 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 continues
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 EVSIN 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 those 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 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 co-founder John Warnock, is not the problem of opening different Macintosh applications. Instead, it's a problem of different Macintosh applications. Adobe is the only company that is 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.

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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.
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Blue about Apple

R. 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!

Torn 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. That’s the line that 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 mis-statements. 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 letter-spacing 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, rol-

CONTINUES
LETTERS

CORRECTIONS

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 Pizza” 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 [I...free [I...free [I...free [I...free support. Both Aldus and Quark charge for support after 90 days.

Merrill Zodd
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...
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

Looking for MaxAppleZoom

I 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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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 ELF 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 ELF 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 ELF 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 glue 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

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld). Include a return address and a daytime telephone number. We regret that, due to the high volume of mail received, we are unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld.
Since we know you’re pressed for time, we’ll skip the standard introduction and get straight to the point.

- Double Helix is the fastest multiuser relational database for the Macintosh. This, you should know, is not our personal assessment, but rather the conclusive results of MacUser magazine’s June 1990 speed-test. And of the four top databases, in five key commands, Double Helix finished first. By considerable margins.

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- By the way, and for the record, we were the first ever to introduce a Mac-based client/server. And while it was revolutionary at its debut in 1986, it is, remarkably enough, still revolutionary today.

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Circle 178 on reader service card
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 30MHz 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 2.0. John Cushwa: base and the liquid of Rail; all 73MB oil, which were left external hard drive; as free-form (editable) objects. He 300Z color scanner; then copied and 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 (exercise-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 remodeled 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 positioned 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-resolution scan of D'pix'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 continue

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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MACWORLD February 1992 39
Another image (rendered from the same model) created in Ray Dream Designer by Tom Cuswa.

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 reflectivity—to the mirror object. For the mirror’s frame, he applied an oak texture map from the Vraptures 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 3 1/2 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 Cuswa imported the original Swivel 3-D Professional by Macworld artist Jim Ludtke, that was supplied to each of the vendors.

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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MTECH 2.0

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 thewick would show through.

The single light source is a white spotlight set at a 32-degree angle in the 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 anisotropial 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.
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* Essentlsl Software ... 30 day MBG
4086 O Easy Alarms 1.1 . . . . . . . . . . . . . . . . . . 31.
Fox Software
5572 OFoxBASE+IMac 2.01 .... . . . ...... 289.
• Franklin Software ..• 30 day MBG
7070 Language Master 2.0 . . . . . . . . . . . . . . . . 45.
• Good Software ... 30 day MBG
2527 OREM 's Property Manager... . .. . ... 339.
• lndlvldual Software •.. 30 day MBG
9640 @Resume Maker 1.0 .. . ...... . . . .. . . 26.
Inform Ix
4955 OWingz 1.1A.. . . .. ........... . . . . 245.
* Intuit ••• 30 day MBG
2507 @Quicken 3.0 ..... . .. .. ........... 42.
• Kaetron Software ... 30 day MBG
8941
OTopDown 3.0 ... . ....... . ....... 199.
Lotus Development
3606 01 ·2·3 for the Mac . . . . . . . . . . . . . . . . 349.
3604 01 ·2·3 Competitive Upgrade . . . . • ... . 99.
• Mainstay ... 30dayMBG
7718 OMacFlow3.54 ... . ...... .. . . . . . . . 188.
* MECA •.• 60 day MBG
2796 @Managing Your Money 4.0 . . . . . . . ... 99.
• Mlcrolytlcs ••• 60 day MBG
9729 Strunk & White's Elements of Style . .. . .. 34 .
7820 @Random House Encyclopedia 1.0 .... 68.
7506 0 Inside Information 1.0 . . . . . . . . . . . . . . 68.
8881


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4140 Multimedia Hand Disc 97 (Dec, '97). ... 75.

Cygnus Software
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2717 Cosmic (1.1 CD-ROM) ............... 37.
2321 Discover Systems 60 day MBG .... 26.
9967 Nautilus (subscription, ...CD-ROM) .... 20.
9966 Shakespeare on Disc (CD-ROM) .... 26.
1874 Mammals of North America (CD-ROM) .. 52.

DuBl·Click
9344 The Wet Set CD (approx. 7000 images) .. 218.

Evermax
1875 Metro CD-ROM Drive 1.3 ........... 469.

Highlightled Data 30 day MBG
7771 Webster's Dictionary (CD-ROM) .... 159.

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7473 Learn To Speak French (CD-ROM) .... 62.
7829 Learn To Speak Spanish (CD-ROM) .... 62.
2615 Lingua ROM II (3-CD Set) ........... 649.
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6382 The Microsoft Office (CD-ROM) .... 479.
6625 Clip Art 3D (2500 full-color images) .... 245.
6636 Image Gallery (2800 line art) .......... 245.
9441 CDROM Portable Drive ....... 399.
2595 General Reference CD-ROM Bundle (includes CDR36, 97 & 7 titles) ... 529.

Passport Designs
8255 Music Creativity Kit CD ........... 189.
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2611 Vocabulairescience 2.0 Spanish CD .. 59.
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3566 Showplace/RenderMan CD .......... 449.
3915 Groller Encyclopedia (CD-ROM) .... 249.
4397 Time Table History (CD-ROM) ....... 57.

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2519 Tactile Multi-Media 2.0 Spanish CD .... 149.

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3921 Mozart Dissonant Quartet CD ....... 39.
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1215 Pratica Musica 2.2 .................. 66.

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6136 Studio Session with Music Library .... 99.

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5937 Macromedia Director 3.0 .......... 669.
2246 Macromedia Director 1.0 ....... 1029.
7383 FilmMaker 2.0.1 .................. 435.
2199 MacRecorder Sound System 2.0.5 .... 174.

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2592 QuickDraw 2.1 ..................... 289.

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8253 TRAX 2.2 ........................ 57.
9442 Audio Media 1.0 .................. 208.
3117 Master Tracks PRO 4 4.5 .......... 315.
8250 Encore 2.07 ....................... 379.
3115 MIDI Interface .................... 79.

SuperMacTech 30 day MBG
9826 Mariah 1.0 ........................ 93.
1195 Voyager 30 day MBG ............... 65.
9328 Voyager CD AudioStaccato .......... 65.
9326 Beethoven 3237 Stravinsky ......... 65.
3316 Exotic Japan 1.0 (CD-ROM) ....... 65.

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1423 Hard Ball II or 8217 Ishido ...... ea. 31.
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3503 Dark Castle ....................... 34.
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4967 Hyper Bible (KJV) or 4966 (NIV) .... ea. 125.

Broderbund Software
4314 Type 1 1.0 ........................ 18.
6516 The Playroom (CP) (color) ......... 29.
8684 Carmen Sandiego Series (CP) ..... ea. 29.
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1356 Patton Strikes Back ............... 35.
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8266 SimEarth 1.0 ...................... 40.
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System 7 Video with Lon Poole (VHS) ... $9.

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5826 Video Expander ..................... 499.
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8784 243STEP TV ....................... 1249.

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9547 Star Trek: The Logical Collection ... 29.
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8231 SoftStream ................ 30 day MBG 4073.
8351 Classic Trilogy (Cabbage, Whist, Hearts) 50.
3472 Family Cards (Solitaire, Rummy, War) 50.
3485 Software Genius .................... 30 day MBG 4819.
3492 Mavis Beacon Typing 1.1 (CP) 32.
9088 World Atlas 1.0 ........ 52.
8828 Spectrum Holobyte 30 day MBG 30.
1676 Macintosh Membership Kit 1.5 25.

8180 Compuserve Navigator 3.0 49.
1674 Membership Kit Navigator Bundle 72.
1754 DataViz 30 day MBG 1823.
1856 MacLink Plus/PC 6.0 129.
8485 MacLink Plus/Trainers 6.0 109.
8719 Dayna .... 60 day MBG 229.
2328 Sargon IV 1.0 (CP) (chess) 28.
9088 Strategic Studies 30 day MBG 22.
2005 American Civil War 1.0 26.
3257 Warlords (empires at war) 33.
8828 StudyWare .................... 30 day MBG 28.
8828 Suite Software .................... 30 day MBG 28.
8828 SpiceMaker 30 day MBG 28.
9096 LSAP Prep for the Mac 3.7 35.
6192 Mum's The Word 1.1A (gardening) 79.
9970 Mum's The Word Plus 1.0 (color) 107.

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1754 DataViz 30 day MBG 1823.
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5737 After Dark 2.0 - Drops screen burn-in 28.
2196 After Dark & M.A.D. Bundle 42.

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7836 Nemesis Go Junior 5.0 19.
1983 Nemesis Scribblor 5.0 29.
7624 Nemesis Go Master 5.0 35.
2471 Nemesis Deluxe Toolkit 5.0 69.
1413 XOR - 30 day MBG 32.
6040 MacGolf Classic 52.
3815 NFL Challenge 1.03 55.

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Abaton - 30 day MBG 6266.
2724 InterFax 24/96 Modem 289.
2724 InterFax 24/96 with InterShare 339.
2724 QuadraLink (with AE Shadow) 205.
1897 Argosy Software - 30 day MBG 3082.
7872 Software Bridge/Mac 2.0.1 99.
2447 RunPC/Remote 279.
2448 RunPC/Network 279.
2448 CE Software - 60 day MBG 8066.
8066 QuickMail 2.5 (5) 249.
8567 (10) 375.
1897 Macintosh Membership Kit 1.5 25.

Microsoft - 30 day MBG 4902 Word 5.0 - Includes an integrated grammar checker, Drag-and-Drop text, and a new Print Merge Helper. With the new Drag- and-Drop feature, users can move words, sentences, and even paragraphs by simply clicking highlighted text and dragging it to its new location. The Print Merge Helper is a graphical on-screen bar which guides users through a form letter step by step, making even the most complex or personalized form letter easy to create. Also takes advantage of System 7.0, including Balloon Help, True Type fonts, Publish and Subscribe and support for Apple Events. Introducing plug-ins in modules, a new modular architecture $299.

Hayes
2300 Smartlink II for the Mac 3.3 84.
8814 Personal Modem 2400 Plus 149.
3522 OPTIMA 96 (with Smartcom EZ) 476.
7391 ULTRA 96 Modem 669.

Insight Solutions
7557 Access PC Tools 60.
9726 Entry Level SoftPC 2.5 125.
4089 Universal Soft PC 2.5 196.
3229 SoftAT 2.5 295.
3441 SoftNow 1.0 3454 (10 Pak) 52.

Intel Corporation
5199 2400ECS Modem 164.640 MBP 225.
7459 Microcom - 30 day MBG 50.
1556 CarbonCopy Mac 2.0 (unlimited) 179.
8027 ModemMax V33 680.

Nuvotech - 60 day MBG
3000 TurboNet (DIN8) 29. 6712 (12 Pak) 279.
1389 Orange Micro 30 day MBG 159.
2384 Orange386 (16 MHz) 159.
2386 Orange386 (20 MHz) 179.

Practical Peripherals - 30 day MBG 8994 2400 V.24 bis Modem 199.
7934 2400 V.24 bis Modem 199.
8984 SmartPack 9600 (with Smartcom II) 529.

Prometheus - 30 day MBG 2590 ProModem 2400 Mini Plus 129.
3832 ProModem Remote Plus 249.
3832 ProModem 2400/69 SRS MiniFax Plus 269.
6890 ProModem Ultima 689.
3831 ProModem 9800M-ECE 199.

PSP Integration Inc.
3143 COMet 1.0 265.
3142 COMet 2.0 265.

Shiva - 30 day MBG 3441 NetServer 1.0 175.
4347 NetBridge or 4942 TelBridge 4942.

Stiks/TOPS
4198 Telencoder (DIN8) 23. 2230 (10) 180.
6202 TCP/IP Network 3.1 187.

Software Ventures - 30 day MBG 3455 MicroPhone II 4.0 (Dec. 91) 215.
3456 Synergy - 30 day MBG 6626 VersaSoft 30 day MBG 6919 9580 PRO 3.6 177.

Tactic Software - 30 day MBG 2996 Traffic Control Personal 1.0 65.

Technology Works - 30 day MBG 1582 GraceLAN 295.
1583 GraceLAN 50 Node Upgrade 159.

White Pine Software - 30 day MBG 3539 Mac 220 85.
3535 Mac 240.1 39, 3541 Mac 241 196.
3544 Exodus 196.

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- 3135 PSI MultiColor .......... .. . .. .. .. .. 99.
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- 2327 PLI 2GB DAT Drive ... . .... ..... . .. 1939.
- 1866 Quick SCSI Card

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THE ICONOCLAST

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, misrepresented 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 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 back 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 uncredited 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 September 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...
only when it was in stock or easily obtainable, specifying delivery dates for purchases, refunding money if delivery dates were not met, and maintained 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, post-sale 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”?
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 Rashomon-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 mistrust its customers, he says—its success comes in part because of considerable attention to customer satisfaction. As proof, his assistant shows 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.
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Why Reading the Manual Just Isn't Good Enough

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
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."

MacAcademy Video Series
MacAcademy videos capture the spirit of a live classroom with the instructor on videotape. Our customers don't want people reading scripts blantly 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 straightforward, 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

MacAcademy presents over 100 live training workshops in every major city in America. MacAcademy trainers are hand picked from hundreds of applicants and are some of the best and most effective Macintosh teachers available anywhere. Over the past few months these MacAcademy teachers have stood in front of over 25,000 Macintosh owners and have been evaluated by each student. Each instructor is graded on a scale of "1" to "5" by each graduate. Currently all MacAcademy instructors must average at least 4.6 to continue training for the Academy.

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?

The True Test of Quality

If our methods didn't work we wouldn't have grown to be the largest Macintosh training organization in the world today. We understand Macintosh training, we know what works, and we know how to get people into a program as quickly as possible. Manuals just aren't as effective!

Test The Power Of Video Yourself

I invite you to take advantage of the MacAcademy Video Training Library listed here. Orders are shipped within 48 hours and fully guaranteed. Thank you for your business.

Here are a few comments from users of the videos:

"Just one of the short-cuts you showed me in Word saved me 20 minutes of set-up time, not to mention frustration, on a new document this morning. Thanks!"

C. Robbins Turlock, CA

"We at AMPSKO Metalworks wish to express our appreciation for your video series. They are demonstra­tional and extremely helpful learning tools which have enabled us to grasp more easily the concepts of the Macintosh computers."

M. Torres Wash., DC

"Having viewed your wonderful tapes for the third time I feel that we are old friends. As a result my Mac SE-30 is running 'lean and mean'. Thanks again."

J.J. Johnson San Jose, CA

"Please accept my compliments on your training series. You explained everything so clearly and I'm amazed at how much I learned..."

P. Dunkel, N. Kingston, RI

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End users circle 129 on reader service card
Dealers circle 150 on reader service card
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 E.Mac 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 E.Mac’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.”

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...
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.

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Circle 39 on reader service card.
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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 True Type 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. Beware 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. 

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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Circle 89 on reader service card
Updates

FEBRUARY 1992

THis section lists the latest versions of selected Mac applications that were announced by the time we went to press.

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V. = version #, Req. = min. RAM and system software required. * = last time (in the past year) this or an earlier version was reviewed. $ = cost of update to registered owners. NA = first version, not applicable. # = contact your dealer for update policy. Blue = new version. Yellow = reviewed product.

continue s
**UPDATES**

- **DYNODE**
  - V.: 2.0
  - Req.: 1MB/6.0
  - $/.: 282

- **EASY COLOR PRINT**
  - V.: 2.0
  - Req.: 1MB/6.0

- **EMPLOYER**
  - V.: 4.0
  - Req.: 2MB/4.3

- **ENCORE**
  - V.: 2.0
  - Req.: 2MB/6.0

- **ENHANCE**
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  - Req.: 2MB/6.0

- **EVOLVE**
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- **EZ VISION**
  - V.: 1.0
  - Req.: 1MB/6.0

- **FASTBACK PLUS**
  - V.: 2.0
  - Req.: 2MB/6.0

- **FAST FOCUS**
  - V.: 2.0
  - Req.: 2MB/6.0

- **FASTLABEL**
  - V.: 2.0
  - Req.: 2MB/6.0

- **FASTPRINT**
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  - Req.: 512K/3.5

- **FAXGATE (MICROSOFT MAIL)**
  - V.: 3.0
  - Req.: 1MB/6.0

- **FAXGATE (GOOFAX)**
  - V.: 1.5
  - Req.: 1MB/6.0

- **FLEEGUARD**
  - V.: 2.7
  - Req.: 1MB/6.0

- **FILMLAB**
  - V.: 1.02
  - Req.: 1MB/6.0

- **FILMSKIN**
  - V.: 1.1
  - Req.: 1MB/6.0

- **FILMMAKER PRO**
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  - Req.: 2MB/6.0

- **FILMMAKER**
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- **FLEXIBLE**
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- **FLEXICAS**
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- **FONTCAP**
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- **FRAGEMAKER**
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- **FREEFORM**
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- **FREEDOM OF PRESS LIGHT**
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  - Req.: 1MB/6.0

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  - LaserMaster's 1200 and 1000
  - LaserMaster's 1200 and 1000
  - LaserMaster's 1200 and 1000

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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 Macintoshs 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 mailserver loads to fairly measure each electronic-mail program. We briefly considered using a network utility to transfer random packets over the network, but...
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 QuickKeys 1, 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 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, QuickKeys' 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 sends an E-mail program 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. The same, 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.
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Are to shoot, dodge, and grab than any code hit on the act! 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

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CASADY & GREENE
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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. #04580

CASADY & GREENE
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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 house. If you master the game, the Room Editor allows you to create your own version of obstacle-filled rooms. #04580

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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.

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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.

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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.

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.

Tesserae
Tesserae 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.

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.

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.

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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.

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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?

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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 terms 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.

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$685

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. ScanDoDA 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.

$624

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 output text directly into your word processor, spreadsheet or database. Advanced features include a built-in dictionary, error checker and deferred processing. NISCAN Spectra

$329
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!

$279

MARSTEK
Langelo" Color Hand Scanner
(M-800 MAC 64)
Marstek announces the first 18-bit color, true Gray-Scale, hand scanner Macintosh. Imagine, Color Scanning with a single pass, capturing over 262,144 colors in lighting speed. The Langelo offers resolution 200 DPI in Color mode and 400 DPI in True Gray-Scale mode. Scanned, edit your images with the powerful or-lt, a 32-bit, advanced image processing package by MicroFrontier. With Marstek's Langelo, anyone can be an artist.

$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 these many unbeatable features. Included with every ScanMaker 600ZS is a full version of Adobe Photoshop. Adobe Photoshop, winner of MacUser's 1990 Eddy Award for Software Product of the Year, is a sophisticated image-editing and retouching program designed for artists and desktop publishers.

$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.

$2298

OPEN 24 HOURS • CALL: 1-800-248-0800
MAii 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

ColorPage T16

This sharp, clear, 16-inch Trinitron gives you 70% more workspace than a 13-inch display. 72 dpi, 683x624, 75 kHz, five mice winner. Uses the built-in video of the new Mac Quadra/040. #04105

$1148

$399

14" Display

#04588

$499

FREE SHIPPING ON ORDERS PLACED BETWEEN 9PM & 7AM E.T.
NEW 21" COLOR SYSTEM FROM RASTEROPS

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

24XLTV
The RasterOps 24XLTV display board delivers 24-bit color at lightning 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

RASEROPS PRODUCTS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorcad Trinitron</td>
<td>3299</td>
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<tr>
<td>Colorboard 208 24Bit Upgrade</td>
<td>280</td>
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<tr>
<td>Colorboard 264/30 24Bit 351</td>
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<td>Colorboard 364 (Video)</td>
<td>699</td>
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<td>Imagepak Still Compression Bd</td>
<td>369</td>
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<td>RasterOps TV Tuner</td>
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<td>RasterOps Video Expander</td>
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<tr>
<td>24&quot; Hitachi Color</td>
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<td>8XLI Video Board</td>
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<td>CLEARVIEW/GSXL Card</td>
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<td>Correctcolor Calibrator</td>
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<tr>
<td>Expresso Slide Scanner</td>
<td>699</td>
</tr>
<tr>
<td>Tilt &amp; Swivel Base</td>
<td>229</td>
</tr>
</tbody>
</table>

RASTEROPS

Expresso Personal Slide Scanner
The Expresso 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 Expresso, delicate color saturation, hue and balance control as well as zoom can be achieved through manual adjustments. #04598

RASEROPS ColorBoard

264/SE30
Add COLOR to your Macintosh SE/30 with the ColorBoard 264/SE30 and support 13" monitor (540 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 through pages, and edit. Includes Low Emission technology standard. PageView is ideal for word processing and entry-level desktop processing. Models to support Macintosh SE, SE/30, or Iie. #03857

$851

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

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 you communicate with greater impact. It's fast and easier for users to get professional results. Movies and presentations can be made with sound, look and play better. #00839

$689

C.O.D. ORDERS ACCEPTED
<table>
<thead>
<tr>
<th><strong>ABRACADATA</strong></th>
<th><strong>Design Your Own Home</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>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 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. Landscape Design to create full-color plans for your property by experimenting with flowers, shrubs, trees, walkways, steps, fences and more. Will include dozens of sample plans.</td>
<td></td>
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<tr>
<td><strong>YOUR CHOICE</strong></td>
<td><strong>$64</strong></td>
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<tr>
<td>03609 Design Architecture</td>
<td>03610 Design Landscape</td>
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<td>03611 Design Interiors</td>
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<tr>
<th><strong>CLARIS</strong></th>
<th><strong>CAD 2.0</strong></th>
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<tbody>
<tr>
<td>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.</td>
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<td><strong>YOUR CHOICE</strong></td>
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<td>03693 Design Architecture</td>
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<tr>
<th><strong>INNOVATIVE DATA DESIGN</strong></th>
<th><strong>MacDraft 2.1</strong></th>
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<tbody>
<tr>
<td>MacDraft is 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, Bezier 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.</td>
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<tr>
<td><strong>YOUR CHOICE</strong></td>
<td><strong>$278</strong></td>
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<td>#00429</td>
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<tr>
<th><strong>SPECTRAL INTERNATIONAL</strong></th>
<th><strong>Infini-D 3D Modeler</strong></th>
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<tbody>
<tr>
<td>Infini-D is 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.</td>
<td></td>
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<tr>
<td><strong>YOUR CHOICE</strong></td>
<td><strong>$515</strong></td>
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<tr>
<td>#00815</td>
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</tbody>
</table>

**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 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. $44

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. $4

POWERFUL PRODUCTS FROM ADOBE
Adobe Illustrator 3.0
You can create PostScript technical illustrations, freeform 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. $369

Adobe PhotoShop 2.0
The affordable Macintosh image-processing program with enough power and versatility to be used as a paint, prepress, 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. $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. $1349

ALL U.S. ORDERS INSURED - NO EXTRA CHARGE
**Easy Color Paint**

Te colorful artwork! Color Paint is really easy to use, and you're a beginner or painting pro. Simply select the complexity level desired, ECP Junior to ECP Artist, and in no time be creating colorful sketches and drawings. This critically acclaimed coloring program features such tools as horizontal and vertical flipping, rotation, zooming and shrinking, and blending, and more. Mark your creativity and flair to your image. #03862

**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

**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 realistic, dramatic art easily, reliably and with consistent results. Use while working in leading applications that support plug-in filters, as a stand-alone application, DA, or for applying effects to PICS animations. #04121

**MacDraw Pro**

MacDraw Pro is a powerful graphics standard for the Macintosh! Tear-off palettes allow access to a palette of innovative and time-saving tools. Features include a flexible style bar, real gradient fills, new precision zoom, and more. Now you can zoom at over 5000x. #773

**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 auto-alising, transparency, full color patterns, transmogrification, and more. #04587

**Raysream 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 environments. JAG is perfectly suited to the needs of advertisers, animators, graphic designers, illustrators, multimedia producers, and 3D enthusiasts alike. #04150

**MacVision**

MacVision is an easy-to-use video editor for your Mac which produces images of 3-D objects. You can then edit, trim, 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. #0705

**Fractal Design Painter**

Fractal Design Painter™ lets your Macintosh create original art or embellish scanned images with realistic natural media effects by duplicating traditional 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. #04660

**Open 24 Hours • Call: 1-800-248-0800**
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.

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, and the InstrumentMaker® application allows design of synthesized sounds for playback directly on the Macintosh.

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.

Midi TimePiece

Video Time Piece

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.

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!

MONSTER GROUP, INC.

MacSpeaker

MacSpeaker opens the door to high fidelity sound on your Macintosh. MacSpeaker is a compact, high powered 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.

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.

OPCODE SYSTEMS, INC.

EZ Vision

EZ Vision is an intuitive MIDI sequencer for recording, editing and playing back music 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 music notation programs, allowing printing of scores.

$548

$99

$29

$375

$169

$79

CALL 1-800-248-9948 IF NOT 100% SATISFIED
PARAGON CONCEPTS
QUED/M
QUED/M is virtually indispensable, with features found nowhere else! The One-of-a-Kind Productivity Tool: Text Editor with Macros. With 70 menu items, more than 50 macros, and custom features. QUED/M (QUality, EDITor with Macros), is the most powerful text editor available. Macros can also be programmed or recorded to meet each user's needs.

$74

TRUE BASIC
True BASIC 2.5
Use the BASIC that gets results - fast! It combines all the best features of modern structured programming in a BASIC that's fast, clean and yet still easy to use. It's fast because it combines a mode compiler, linker and editor in quick fix major software development. True BASIC is a solid, endable solution.

$54

MEDIACLAB
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.

$44

CLARIS
HyperCard V 2.1 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.

$139

3 GREAT PROGRAMMING TOOLS FROM SYMANTEC

THINK Reference
THINK Reference is an essential tool for all Macintosh programmers. This convenient reference is a comprehensive guide to the critical system information that you need to program the Macintosh. As a professional programmer, you'll save time and effort as you quickly locate information using extensive hypertext search and cross-reference capabilities. As a novice, you'll learn faster and understand more through detailed descriptions of Toolbox routines, data types, and system globals, as well as informative graphics.

$69

Think Pascal 3.0
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 80286. It's also compatible with MPW and can use MPW object files without conversion. The development environment makes programming clean and easy.

$164

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.

$199

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INFO MANAGEMENT SOLUTIONS FROM 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

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

$159

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. $214

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

$71

TouchBASE

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

$78

30-60 DAY MONEY BACK GUARANTEE ON MOST PRODUCTS
AATRIX SOFTWARE
CheckWriter II V3.2
The most versatile finance software in its class! V3.2 offers complete budgeting, graphing, over budget warning, an address database with$29
$198
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 will print W-2’s, 941’s, and provide information for all other ports. #00192

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

$61

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, mfgr’s, schools and local government. #04111

$249

$114

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 clips, layaways, mailings, and reports. Primarily for service businesses, professionals, clubs and associations with simple, unstructured inventory needs. #04599

ELEWARE
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

$138

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

$93

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<table>
<thead>
<tr>
<th>Category</th>
<th>Price</th>
<th>Description</th>
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<tr>
<td><strong>Application Development</strong></td>
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<tr>
<td>- Dakota Software</td>
<td>1350</td>
<td>Cheetah Special Edition for Macintosh</td>
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<tr>
<td>- EasyJob</td>
<td>69</td>
<td>Perfect for creating résumés, job applications,</td>
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<td>- Fontographer 3.1</td>
<td>80</td>
<td>...and whatever else.</td>
</tr>
<tr>
<td>- OfficeWorks 2.0</td>
<td>129</td>
<td>Integrate Word processing with Mac's built-in</td>
</tr>
<tr>
<td>- PowerToy</td>
<td>18</td>
<td>Enhance your Mac's capabilities</td>
</tr>
<tr>
<td><strong>Accounting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- QuickBooks Pro 5.0</td>
<td>799</td>
<td>Integrate accounting with Mac's built-in data</td>
</tr>
<tr>
<td><strong>Desktop Publishing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Aldus PageMaker 3.0</td>
<td>499</td>
<td>Perfect for creating newsletters, brochures,</td>
</tr>
<tr>
<td>- QuarkXPress 5.0</td>
<td>1199</td>
<td>...and whatever else.</td>
</tr>
<tr>
<td><strong>Networking &amp; Security</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- AirPort Express</td>
<td>59</td>
<td>Connect to wireless networks</td>
</tr>
<tr>
<td>- Secure I 2.0</td>
<td>149</td>
<td>Secure your network traffic</td>
</tr>
<tr>
<td><strong>Multimedia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- QuickTime Player 3.0</td>
<td>199</td>
<td>Play and manipulate multimedia files</td>
</tr>
<tr>
<td>- iMovie 3</td>
<td>199</td>
<td>Edit and share videos</td>
</tr>
<tr>
<td><strong>System Software</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mac OS X 10.4</td>
<td>Free</td>
<td>The latest operating system for Mac</td>
</tr>
<tr>
<td>- Time Machine 3.2</td>
<td>29</td>
<td>Back up your Mac with ease</td>
</tr>
<tr>
<td>- Bonjour 3.0</td>
<td>49</td>
<td>Discover and connect to devices and printers</td>
</tr>
<tr>
<td><strong>Developer Tools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Xcode 4.1</td>
<td>299</td>
<td>Develop applications and extensions for Mac</td>
</tr>
<tr>
<td>- Swift 2.0</td>
<td>199</td>
<td>Develop applications and extensions for Mac</td>
</tr>
</tbody>
</table>

*OVERNIGHT SHIPPING-AIRBORNE EXPRESS $3*
## Technology Products

<table>
<thead>
<tr>
<th>Category</th>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer Hardware</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPUs</td>
<td>Intel Core i9 9900K</td>
<td>$499</td>
</tr>
<tr>
<td>Storage</td>
<td>AMD Radeon RX 480 8GB</td>
<td>$189</td>
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<tr>
<td>Display</td>
<td>Dell XPS 13 2-in-1</td>
<td>$1599</td>
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<tr>
<td><strong>Software</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Systems</td>
<td>Windows 10 Professional</td>
<td>$109</td>
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<tr>
<td><strong>Networking Equipment</strong></td>
<td></td>
<td></td>
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<tr>
<td>Routers</td>
<td>TP-Link Archer C54U</td>
<td>$149</td>
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<tr>
<td><strong>Security</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antivirus</td>
<td>Bitdefender Antivirus Plus</td>
<td>$69.99</td>
</tr>
<tr>
<td><strong>STANDS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyboards</td>
<td>Logitech G913 Carbon RGB</td>
<td>$199.99</td>
</tr>
<tr>
<td><strong>Power Management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batteries</td>
<td>Duracell Ultra AAs (4-Pack)</td>
<td>$7.99</td>
</tr>
</tbody>
</table>

## Additional Notes

- For more information, please contact the nearest retailer or visit our online store.
- Prices are subject to change without notice.
- Please check for availability before purchasing.

**Se Habla Español**

**OPEN 24 HOURS • CALL 1-800-248-0800**
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 "/" key. It will also fully support Apple's new System 7 operating system.

#00518  Lotus 1-2-3  $339

$89

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

$234

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

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

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

**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

**FTSYNC**

**Accountant, Inc.**

Accountant, 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. Accountant, Inc. is a fully integrated accounting system. 3986

**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

**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

**SMART BUSINESS PRODUCTS FROM INMAN**

**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

**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

**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

**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

**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

**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

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

**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

**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
**LSOP Disk Files**

Conveniently 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.

**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 V L-N, 330 V L-G and 330 V N-G. The SurgeArrest family incorporates three levels of protection: SurgeArrest, SurgeArrest PLUS EMI/RFI filters, and SurgeArrest PLUS with Tel, which includes phone line suppression and a lifetime equipment protection guarantee.

- SurgeArrest $7
- SurgeArrest Plus $17
- SurgeArrest Plus with Telephone $59

**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. "Silicone" treated Oxford nylon outer shell is water repellant, 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.

- SurgeArrest $74

**TRAVEL WITH YOUR MAC SAFELY WITH I/O DESIGN CASES**

- Ultimate Classic/SE Case $68
- Ultimate Classic/SE Extended Case $74
- Ultimate LC Case $94

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.
**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 $35
  - #04557 Queen Set $35
  - #04556 Pillowcases $13

**COSTAR**

**Stingray**
Stingray lets you work faster and with more comfort than any other pointing device. 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 be amazed at how fast you speed across your screen and through your applications with the Stingray.

- #00524 - Platinum $88
- #00523 - Black $63

**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

**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

**M ICROTOUTCH 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

**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

**MICROSOFT**

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

**NO GIMMICKS - NO HIDDEN CHARGES**
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

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

Model 32 with Digital Darkroom

$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. Mouse Man features include:

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

#04258

$76

OPEN 24 HOURS • CALL: 1-800-248-0800
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

**SUITCASE II FROM 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/DA. If it finds and it opens them automatically.

#02002

**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

**CASSADY & GREENE**

**QuickDEX**
QuickDEX is the fast and painless way to your data right under the Apple menu. QuickDEX stores data in “card decks.” Either fit 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

**UTITIES**

**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
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 100 percent. Compatible with any of the Macintosh II series, the Mac LC and the SE/30 and most Macintosh software.

#00818

$54

SHADOWWRITER

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 IIISC on the network!

#04159

$127

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 LP 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

$254

FREEDOM OF PRESS

Freedom of Press Light

#03839

$55
ALADDIN SYSTEMS
Shortcut 1.5.2
Shortcut is a disk management utility that appears in every program's Open and Save dialogs. 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

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 programs like Disinfectant Virex*, On-Location* and with files like control panels, INITs and disk accessories. It creates auto-expanding files and secures compressed files with two levels of password protection. #00512
$59

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 disk 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
$44

Stuffit Deluxe
Stuffit Deluxe is the easy-to-use Macintosh standard for compression, encryption and archiving. Files can be compressed up to 96%, 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

BOOST YOUR MAC'S RAM WITH SIMMS

1x8x80ns SIMMMS
$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
SCREEN SAVERS BY BERKELEY 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

More After Dark #04053 $24

SCREEN UTILITIES

SCREENSHOT
A Control Panel device that makes capturing images a snap! Both black and white and color screens can be captured with equal ease. Screenshot will even convert color images to black and white. Screenshot allows you to isolate a specific area of your screen; a menu, window, or selection. Just hit a user-defined keys to capture the screen to a variety of image formats.

#03554

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

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

#04435

Catalog of Actors $10

OPEN 24 HOURS • CALL: 1-800-248-0800
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.

MICROSEEDS

$35

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.

Rival

$54

PROTECT YOUR WORK WITH A SYMANETIC 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 also works 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.

$119

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.

$85

MAJOR CREDIT CARDS

ACCEPTED

SUNDAY AIRBORNE EXPRESS DELIVERY MOST DESTINATIONS

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
Now Utilities

According to MacUser, "Now Utilities must-have for experienced users and novice users alike." Included in the collection are: Super Boomer, rated as the best of the Open & Apple dialog box enhancers; Startup Manager, the most powerful session manager; and WYSIWYG nus, which groups fonts families and typeface. Plus: NowSave, New Locker, AlarmsClock, Profiler, MultiMaster, paintPicture, and NowMenus! All components are item 7 compatible.

Retrospect 1.3

Schedule automatic, unattended backup to any tape, optical or cartridge drive with Retrospect's calendar launch feature. 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.

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.

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.

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.

Mac Tools Deluxe

Mac Tools provides utilities for date 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.

Drive7

Did you know that Apple's hard drive formatter works only on Apple drives? And most third party drives are incompatible with the Apple's? Drive format, updates third party drives with Apple's and Syquest, passwords, locking, and more! If you have multiple hard drives, you need Drive7! The most versatile and affordable formatter available.
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 a maximum throughput rate of 38,400 bps, saving you time and money. The Viva 9642e modem has sophisticated features like auto-speed adjustment, auto-speed buffering, auto-soft 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

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 Advanced 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.

#0028

$89
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.

#0479

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

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 adapter, freeing your serial ports, and enhancing portability. TelePort, 2400 baud Hayes compatible modem, incorporates MNPS data compression/error corrections. Eddy Award 1990.

#00395

PROFITABLE 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 1.0 fax software.

#0479

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

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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 at any speed from 50 to 57,600 baud. It includes predesigned front-ends that put you in touch with MCI Mail, CompuServe, Dow Jones, and other info services.

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.

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!"

VersaTerm
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), ADSL (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.

White Knight
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.

Lexus
Lexus 2400 Turbo Lexus Modem Intelligently, compact 2400 baud modem. Fully compatible with Hayes AT commandset. Easy to install and ready-to-use, all cables included. All the features you need in a modem including auto answers, auto Dial and Advanced 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.
**TechZone**

**GOSBY 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 using VGA graphics expanded memory. Includes Software Bridge/Mac for document translation. RunPC/Network connects one of 10 Macs to a PC via modem. Incredible prices! $279

**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. $279

**SB/Mac Bridge V. 2.01**

Engine being able to edit DOS documents in your Mac format just by double-clicking them! With SB/Mac you can. Simply double-click on 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). $99

**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. $339

**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. $318

**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 activities, meetings, private work sessions, even recurring weekly or monthly appointments in a single step. $314

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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!**

**PhoneNET Liaison**
Liaison is a fully automatic software router that connects up to five different AppleTalk networks—including LocalTalk, Ether-Talk, 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

**PhoneNET Manager’s Pack**
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)

**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

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The Mac Zone
Established 1986
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.

$348

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.

$230

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.

$299

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.

$1899
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 EtherTalk™ 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

Mac Con+ 30 IE $219

$199

$189

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

Nuvolink SC-T $358

NuvoLink SC
Plug the NuvoLink SC into the SCSI port of your Mac, and can connect to an Ethernet! 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

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 the 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

#1485 Mac 286 V3.0 Single $1078
#1435 Grappler 9 Pin (C/Mac/Gs) $1678
#3562 O.M. 386 16Mhz $1083
#2080 Grappler Mac LS $109
#59 O.M. 386 20Mhz $109
#3015 Grappler Mac LX $198
#230 Orange Peripherals Kit $149
#1517 512K Adapter Kit Grappler $175
#3564 Grappler Plus $77

$1097

#03858 10 Base T HUB $659
#00221 MacCon+ II E $299
#00220 MacCon+ II T $299
#003641 MacCon+ II E $299
#03642 MacCon+ II T $299
#003641 MacCon+ II E $299
#03644 MacCon+ II T $299
#00227 Asante EN/SC $399

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THE MAC ZONE
Established 1988
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 AM 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!

#00532 33Mhz ................................................. $1379
#00534 33Mhz w/FPU ........................................ $1679
#00535 40Mhz ................................................ $1479
#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.

#00531 33Mhz ................................................ $949
#00533 33Mhz w/FPU ....................................... $1049
#00534 33Mhz w/FPU ....................................... $1179
#00535 40Mhz ................................................ $1349
#00536 40Mhz w/FPU ....................................... $1449

Magellan 040
PREMIUM 68040 accelerator for the cintosh SE/30 and IIsi! With Magellan you get the jaw-dropping workstation performance of a 35MHz 68040 CPU, with PIMMU FPU built-in. SwitchMatic™ technology switches you between 68030 and 68040 in a few clicks — on the fly, no restarts for 68040-finicky applications. High-end graphics, CAD, statistical analysis and in other computer-intensive tasks fly past in a blur of speed!

#00292 Board IIX ........................................... $2195
#00293 Board SE/30 ........................................ $1995
#00294 Board IIS ........................................... $1995
#00295 Board O40 ICI ...................................... $2195

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.

#00545

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**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 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

**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

**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 IIfi a slot extender cache card and math-co-processor (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

$309

**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

**DAYSTAR LINE LISTINGS**

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<tr>
<th>Part Number</th>
<th>Description</th>
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<tr>
<td>#03730</td>
<td>Ram Powercard w/o SIMMS</td>
<td>$14</td>
</tr>
</tbody>
</table>

FPU is a floating point math co-processor.
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.

DataPak MO 512Mb Removable, Rewritable Optical Drive

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 alien. All DataPak MO drives are covered with a one-year warranty and an 800 technical support line.

#00177 DataPak MO 512 Mb $2899

#00164 Optical Cartridge $208

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

DataPak 45 Meg (Plus/SE/Classic footprint)
#00175 $649

DataPak 11c (Mac llcx/ilci footprint)
#00176 $699

DataPak 88 Meg
#04062 $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 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 HC 650Mb HD Ext...... $2899
- #04210 HC 1000Mb HD Ext.... $3995

$2195

FWD LOOPocket 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 PocketHammer's 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, PocketHammer function flawlessly in the most demanding environments. For professional users whose data is irreplaceable, the PocketHammer is the only choice.

- #00506 PocketHammer

$799

QUANTUM 52 QLPS
Datacels 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, IIX, IICx, IICl, or IIFx.

- #00019 Int 105 Mb QLPS IIC/x ............. $495
- #00163 Quantum 210 Mb Int H ............. $949
- #00405 52 Mb QLPS Ext H ............. $399
- #03683 105 Mb QLPS Ext H ............. $549
- #04225 Int 105 Mb QLPS SE/IIC ............. $499
- #04693 52 Mb QLPS Int IICl ............. $322

$329

NOW OPEN 24 HOURS EVERYDAY
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.

$839

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.

$399

NEW PRODUCT

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).

$499

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.

$699

OPEN 24 HOURS • CALL: 1-800-248-0800
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NEC's CD Gallery™ adds worlds of exciting new capabilities to your Macintosh computer.
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Amazing Paint, Jan 184
CA-Cricket Draw, Jan 42
Canvas, Feb 18, Apr 101
color paint programs, Apr 164
ColorStudio, Jan 144, Apr 144, Sep 135
data visualization, Mar 172
ElectricImage, Dec 181
Envision, Feb 18
Infini D, Sep 222
Initial Caps, Aug 172
IRIS Graphics Library
MacGraphX, Apr 175
MacPaint Two-Page Display, May 132
Great Paint Accounting, Nov 186
GreatWorks, Oct 99, Nov 163
Guide, Nov 194
GunShy, May 211

**HammerDisk4 removable-cartridge disk drive, May 124**
**HammerDisk600S erasable optical drive, Jun 138**
**HammerFAM 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, Sep 99, Dec 17
large-capacity, Jul 184
Library 80, Apr 171
MicroStar Series 1300, Oct 97
MicroNet, Nov 19
Microtech, Feb 119
partitioning, Aug 189
PocketDrive, Dec 117
Storage Dimensions internal, Feb 119
SyQuest suit, Feb 113
Tsunami 80-12, Apr 171
HardDisk hard drive, Mar 136, Sep 184
Hard Plus 1.0 Gb - 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 600 hard drive, Jul 184
Health risks, computer-related, Aug 87, Sep 135. See also ELF emissions
Heat Seeker II Macintosh clone, Nov 167
HiQ, Feb 115
HOPS, Apr 97
HP Desktop printer, Jul 18
HP DeskWriter C printer, Oct 91
HP high-capacity hard drives, Dec 18
HP LaserJet printer, Feb 42, May 142
HP LaserJet III printer, Dec 156
HP LaserJet III printer, Jul 157
HP LaserJet III printer, Jul 157
HP LaserJet III printer, Jul 157
HP PaintColor Color Graphics Printer, Feb 168
HP PaintWriter printer, Jun 111
HP PaintWriter XL printer, Feb 168
HP Scanner IIc scanner, Nov 157
HP Scanner Plus scanner, Oct 146
Habitat port repeater, Oct 20
Human Immune System
Hydra One board, May 107
Hyper-Abledata, Apr 124
HyperFile, Dec 186
HyperCard, Jan 101, Apr 124, Sep 297
2.0 Development Kit, Apr 191
2.0 Upgrade, Apr 191
adding rules, Dec 226
Andean World, The, Apr 124
Bullet Tubo, Apr 124
Bayshore Blast, Apr 124
beep when button pressed, Nov 257
Bird Anatomy II, Apr 124
Book of MIDI, The, Apr 124
Bubble Help for HyperCard, Apr 124
Convert II, May 192
Cosmic Omen, Apr 124
Dancing Mouse, The, Apr 124
Dialoger Professional, Apr 124
dairy stack, Feb 264
DisplayNet, Apr 124
Earthquake Preparedness
Earthquest, Apr 158
EasyKasai, May 195, Sep 58
El Verbo Simple, Apr 124
figuring angle of gradient fill, Jun 204
GunShy, May 211
Hyper-Abledata, Apr 124
HyperFile, Dec 186
HyperCard VideoDisc Toolkit, Feb 178
HyperMailbox, Apr 124
HyperScanner, Apr 124
HyperSnap, 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
LesserCard, Apr 124
Ludwig van Beethoven Symphony No. 9, Apr 124
MacFrog, Apr 124
MacKeeStack, The, Apr 124
MacroScope, Apr 124
Manage Your Closet, Jul 250
Metamorphosis, Apr 124
Microsoft Excel Tutorial, Apr 124
multimedia design, Apr 124
Music Card, Apr 178
Outdoor and Vacation Adventure Guide, Apr 124
Peacoast, Jan 190
Revolution, Apr 124
ScriptEdit, Jun 190
selecting user level, Apr 190, 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
Terrormo, Apr 124
TypeChart, Apr 124, Jul 249
Video Publisher, May 113

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Circle 32 on reader service card
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<table>
<thead>
<tr>
<th>Feature</th>
<th>BeagleWorks</th>
<th>ClarisWorks</th>
<th>GreatWorks</th>
<th>Microsoft Works</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 7 Savvy</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>In-Context Editing™ (multiple documents)</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Paint module</td>
<td></td>
<td></td>
<td>256 Colors</td>
<td>Black&amp;White</td>
</tr>
<tr>
<td>Common toolbar w/module-specific tools</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Automatic irregular text wrap</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Multiple columns can be turned on/off anywhere on the page</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

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System Requirements: Mac Plus with at least 1 megabyte of memory; System 6.0 or later, hard drive with 2 megabytes of free space.

Circle 76 on reader service card
**TigerSoftware brings you a new way to use your Mac.** This product, a brand new release, puts a library of valuable information at your fingertips.

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- **Education** - 11 topics including: Literacy, Educational Expenditures, Newspapers and Libraries.
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- **Quick, Easy and Fun to Use!** There are no commands to learn; just point to a country on any index map, and the desired map appears — instantly! You can even print customized reports of maps and data. Plus, both map and text fields can be exported for use in desktop publishing.

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From there, explore the earth's geography with The Toolworks World Atlas. This package contains hundreds of thousands of diskettes' worth of information, fun and productivity are packed onto just one speedy CD-ROM! They include the amazing, full-length encyclopedia, complete with enhanced sound; a comprehensive world atlas, presented in full-color; the entertaining Cosmic Osmo; complete Operation Desert Storm with photos and much more; Ludwig Van Beethoven Symphony No. 9; the classic fairy tale, Cinderella in English and Spanish; and The Time Table of History. Without a doubt, it's the perfect introduction to CD-ROM, with everything included, nothing else to buy.

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From there, explore the earth's geography with The Toolworks World Atlas. This package contains the most extensive collection of full-color maps you'll find anywhere. There's also plenty of data about each country and region: population, industry and more.

For a little fun, try Cosmic Osmo - winner of the 1990 MacUser award for "Best Recreational Program." This fascinating adventure game follows Cosmic Osmo to the Worlds Beyond the Mackenzi.

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Thunderous Digital Color!

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 area - without any distortion. Its 15" screen is perfectly flat - and provides the highest refresh rate among its so-called competitors. Crisper images, brighter colors, richer tones and more contrast. And (the revolution continues...) the 3FGx features NEC's Reduced Magnetic Field technology which meets stringent Swedish IPRR standards for lower ELF and VLF emissions.

The NEC Multisync 4FG. The 4FG revolutionizes monitors in one very important 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 Tumatch colors! Like the 3FGx, the 4FG provides crisp images - 36% larger than the Invar Shadow Mask (it's very technical) provides displays that are 20% brighter.

Another innovation: The Multisync 4FG monitor's microprocessor-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 Choos - The NEC Multisync 5D. The Multi­sync 5D has a long list of specifications, capabilities and features. It has a slew of technical innovations that set it apart from other color display in the world. But to see what it's really all about, just look at it. An explosion of color! Blistering speed! Crisp reproduction with NO blurring and NO distortion. The 5D is the culmination of every NEC breakthrough. Except biggest A massive 20" screen, compatible with everything from VGA to incredible 1280 x 1024 graphics, DOS and Macintosh. Perfect for Windows, high-end graphics, CAD/CAM and sophisticated desktop publishing applications. The etch screen technology delivers maximum contrast, minimum glare and the Dynamic Beam Focus allows for the sharpest corners you've ever seen in a display - edge to edge.

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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 new breed of "programmable" mice, they’re a pleasure to work with. In the ScanMan 32 hand scanner through five passes, 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 it easy to get 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 dimensioning guide for full-page image 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.

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 adapter, 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 and commands, requiring enormous cleanup — making 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 typesetters and sizes are no problem, and printed characters, in any size of typestyle are instantly recognized. It will even automatically convert two scans into one, full-page image.

What about larger memory-intensive photos or pages picked 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 slow-downs, all of your ScanMan 32 scans 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 Predesign — 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 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.

Businesses use scanners as capture tools that describe about, and for keeping archival records of paper documents with high quality. 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 in 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 files enable 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 form, you can alter the screen angle, dithering options and proportions of the document.

Mixed mode. The third, and least common method of scanning is Mixed mode. Mixed mode is useful for certain specialized applications, and for experimenting with ScanMan to produce different effects.
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-Window systems more convenient to use.

Now, Macintosh users can save desk 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 desk 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 programmed 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.

Assign tasks to mouse clicks.
See your mouse displays.

A list of current applications.

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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 ideas. 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.

IdeaFisher is the brainchild of Marsh Fisher, co-founder of Century 21 International Real Estate Company. It is a 7 megabyte companion for the Macintosh computer, designed specifically to help you trigger new ideas. Innovative ideas, from your memory, sparked by dynamic association. It is composed of two distinct databases: OBank and IdeaBank. OBank contains nearly 6,000 questions to clarify, analyze and solidify your thoughts. When you answer questions posed in OBank, 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 help to stimulate convergent and divergent thinking, reminding you of imagery, facts and feelings. In all, these mental connections open the door to millions of ideas.

IdeaFisher becomes a pipeline to rich sources of information 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, Art, Business/industry/occUpations, money, Clothing/jewelry/grooming, Colors, Communication/education, Comparisons, Energy, Environment, 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: you use a concept, based on your review of associated words and phrases, the more original thought will be uncovered. As with the work of 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 are found at the top 50%. Second 50% (containing the excellent idea) is often buried in our subconscious: our memory. That's why techniques of creative thinking cannot overcome such simple obstacles: 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 remember 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 fraction of them. Their names, the stories they told you, 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 will come rushing back. Your mind will take a look at the 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:” Recording, Retention and Re-invention. It takes a systematic approach to creative thought. These steps are: Recording information (memorization); Retrieving information (recalling and reconstructing); Recombining information (putting information together in different ways). Together, these steps unear...
**Lotus 1-2-3 For The Macintosh!**

**VIEWER'S NOTEBOOK:** The thoroughbred of Macintosh spreadsheets, Lotus 1-2-3 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, Lotus 1-2-3 gives users the ability to perform true 3-D functions on a Mac. Lotus 1-2-3 for the Mac includes Incinerator, a new utility for automatically emptying the trash with any number of "filters" for precise automatic "Trash 'Empties" feature. With only 1-2-3, you can have floating toolboxes and palettes, customizing your own worksheet. Moving around is easy and streamlined, allowing you to quickly select areas (before or after changing commands). You get cell editing and the ability to directly manipulate chart elements. You also get a 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. Lotus 1-2-3 for the Mac also includes Incinerator, a new utility for automatically emptying the trash with any number of "filters" for precise automatic "Trash 'Empties" feature.

Lotus 1-2-3 for the Mac gives you the ability to perform true 3-D functions on a Mac. Lotus 1-2-3 for the Mac includes Incinerator, a new utility for automatically emptying the trash with any number of "filters" for precise automatic "Trash 'Empties" feature.

Lotus 1-2-3 for the Mac is fast and simple. It includes Incinerator, a new utility for precisely deleting files that are over-written with zeros. No chance of any recovery. Very simple to use, fast and easy to make better use of your trash.

**The Gold-Plated Trash Can Syndrome!**

**VIEWER'S NOTEBOOK:** We're not sure, but we think that this is the only true trash utility in world. While trash has never seemed like a problem area, TrashMaster provides it with some amazing features. One of the most important features is its ability to perform true 3-D functions on a Mac. The ability to perform true 3-D functions on a Mac is an enormous advantage. And the Lotus 1-2-3 menu is very handy utility. The ability to perform true 3-D functions on a Mac is an enormous advantage. And the Lotus 1-2-3 menu is very handy utility.

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 enforces confidential files - for good! TrashMaster gives you the ability to 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 DataBank and the Apple Data Access Language. Read FoxBase and dBASE files directly.

Lotus 1-2-3 for the Mac is fast and simple. It includes Incinerator, a new utility for precisely deleting files that are over-written with zeros. No chance of any recovery. Very simple to use, fast and easy to make better use of your trash.

**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 drag into the trash. All of which makes TrashMaster a very handy utility. The ability to 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.

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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 hardware 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 2K 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...
**ADobe Illustrator:** A slow 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 level of speed and creativity. It's the only system capable of precise illustrations, extensive text handling, fully automatic graphic 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 page 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.

*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 review them in seconds. You'll create top-notch ads, illustration, line art, images and photos. 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 or any scanner — from low end black and white to high end drums. A host of controls and filter tools enhance your creativity and the powerful paint tools are unparalleled.*

**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. Adobe Photoshop is a powerful photo editor for 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 or any scanner — from low end black and white to high end drums. A host of controls and filter tools enhance your creativity and the powerful paint tools are unparalleled.

**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 range of spectacular 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 this, distortions and manipulations. 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 "illisstrip" 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, dissolve, zoom out, page turn, radial wipe, spiral boxes, roll 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 perspective, radial blur, twist, 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 track, an overlay track and 3 stereo audio tracks. Just set your clip 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 photoshop:**

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<thead>
<tr>
<th>Product</th>
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<tr>
<td>BAX2501 Adobe Photoshop</td>
<td>$555.00</td>
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<td>BAX2932 Adobe Illustrator</td>
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<td>BAX2933 Adobe Premiere</td>
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Adobe Illustrator: Macintosh, PC, or SE product line. Plus or Classic with a hard disk at least 2 MB of RAM using System 6.0 or greater or 4 MB of RAM using System 7. Adobe Photoshop: Macintosh or SE product line. 4 MB of RAM using System 6.0 or greater. 4 MB of RAM using System 7. Adobe Premiere: Intel family computer, 4 MB RAM, high-speed hard disk (80 MB of recommended System 6.0 or greater. QuickTime 6.0 or greater. Adobe Photoshop v2.0 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, textures, 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 can be created, including surface textures and designs. In our first session, we created several billion 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 main elements of the scene. Main elements of the scene are essentially anything that moves in a scene, from the camera, to 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). Then had a scene. We could change the texture of the surface and how the light reflected off of it and easily control the various shading techniques. The more you work on your images, exploring the 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.

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 render monitor 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.**

**Showplace.** Showplace is the forum for your objects created with MacRenderMan technology, letting you create a dazzling 3-D scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar animation all on one CD-ROM. Showplace lets you create a scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar animation all on one CD-ROM. Showplace lets you create a scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar animation all on one CD-ROM. Showplace lets you create a scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar animation all on one CD-ROM. Showplace lets you create a scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar animation all on one CD-ROM. Showplace lets you create a scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar animation all on one CD-ROM. Showplace lets you create a scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar animation all on one CD-ROM.

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 functions were clearly demonstrated in a straightforward 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!

**Information & Orders:** 1-800-666-2562

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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 magnetics on the road, nothing gives you the unlimited capabilities of the PLI Infinity-40 and 88mb drives. The PLI Cartridges carry a full warranty. Includes PLI's famous Lifetime Maintenance. Once the PLI drives and cartridges are thoroughly tested, for 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 extremely easy to use. 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).

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.

Priorities 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 by 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.

VISONARY SOFTWARE
BAK2403 First Things First 2.0 $49.00
Any Macintosh with at least 1MB of RAM and System 6.0 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 designed feature is the beautiful color matrix: 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 plentiful; create shapes, line-time 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, while 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 virtually 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...
**Enhance And Modify Your Fonts With Amazing Results!**

**REVIEWER’S NOOTEBOOK:** Now anyone can get typographic-quality effects and enhancements using their existing type, with FontMonger, the super fast, simple-to-use type customizer. Modify the look of any typeface, including adding individual characters to create custom faces. Modify existing typefaces into 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 the characters from several font families, to create unique small caps, composite characters, customized faces and logotypes.

FontMonger also offers support of Adobe Illustrator and Aldus Freehand files. You can create or modify characters with 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 existed).

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 70.

**True Type.** 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.

**Advanced Grayscale Image Enhancement And Manipulation.**

**REVIEWER’S NOOTEBOOK:** 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 high-weight 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. Use today by graphic designers, scientists, publishers and professional retouchers. Magnificent anti-aliasing tools to eliminate jagged edges and uneven tones.

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, drop, 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, postize just a portion of the photo and eliminate unwanted shadows — even lighten shadows.

Create different 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 options allow you to create spectucular borders.

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 grayscale. 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 to 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.

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**Int’l Orders:** 305-443-8212

**Fax:** 305-444-5010

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**TIGER SOFTWARE**
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.

**Improve Your Writing by Checking Grammar, Style, Punctuation, and More.** In business, you’re judged. Also, better written documents can represent you as a professional. 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.

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.

**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 and efficient, fiction must often go on and on. Good fiction writers create their own style and use literary license. RightWriter can find common problems in fiction writing, without imposing the stricter rules employed for business writing.

The concept is to provide you with a tool that enables you to quickly and easily improve your writing. The result is a clean copy of grammatically correct and delightful writing. Now RightWriter works even better on Macintosh.

**Correction:** The type of writing before analyzing a document. By making this selection, you actually change the rules RightWriter uses for the analysis.

**Grammar Rules**

- Noun-Verb Mismatch
- Sentence Fragment
- Run-On Sentence
- Missed Word
- Missed Pronoun
- Missed Article
- Wrong Verb Form
- Missed Word
- Possessive Use
- Is This Correct?
- Repeated Word
- Capitalization

**Style Rules**

- Positive Voice
- Split Infinitive
- Long Sentence
- Sentence Length
- Difficult Sentence
- Use Verb Form
- Long Paragraph
- With But
- Conjunction Start
- Weak Sentence Start
- End With Preposition
- Negative Sentence
- Use Simpler Terms
- Use Simpler Words
- Consider Omitting
- Ambiguous Wording
- Cliché

**BONUS**

**Strunk & White’s: The Elements of Style**

**Electronic Edition**

Includes Free when you buy RightWriter for the Mac!

Readers 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**

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**Both Just $29.90!**

**RightWriter Mac**

B013360 RightWriter Mac...

Requires 5.0 and any Macintosh computer. $29.90...

SOLD OUT. Please allow 3-5 days for delivery.
Take Your Information With You!

**REVIEWER'S NOTEBOOK:** Dynodex — The Real Contacts Database is an incredibly full-featured address book database manager that includes both application and desktop accessor versions. It allows you to print address books for virtually all popular formats and personal organizers (including Filofax® Franklin®, Time/Design®, Day Runner® and the ever-popular Day-Timer®). You can also create custom designs and styles for whatever purpose you can imagine. Dynodex's data entry screen is user-friendly, 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. When you're finished with the print process, 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 selects 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 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, especially designed micro-perf 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.

Dynodex is a simple, powerful backup system for virtual any manufacturer's books. The automatic cutover feature actually keeps your computer running — right through a disk failure! Dynodex 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 the data with lightning speed. Once the repair is complete, you're back in business with an archive that's immediately usable, unlike a tape or floppy backup.

If Acme's server disk crashes, Dynodex automatically moves over its server backup and an archive that's immediately usable, unlike a tape or floppy backup. 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, transparent backup without any effort at all. Just install DiskTwin and never worry about it again. Another important advantage of DiskTwin is that it features Automatic Cutover, which keeps your Mac online during a system crash, seamlessly switching you to the second drive. DiskTwin has the ability to rebuild bad blocks at up to 8MB/per minute. And with DiskTwin's parallel SCSI buses, you don't suffer any performance loss! DiskTwin was awarded an honorable mention for storage product of the year in the MacUser Editor's Choice 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 a fact that every time you work on your machine, you take a chance that some event or other will cause your machine to crash, and that event will probably leave you with a pile of data that is lost forever.

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 Macs. The automatic cutover feature actually keeps your computer running — right through a disk failure! 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 the data with lightning speed. Once the repair is complete, you're back in business with an archive that's immediately usable, unlike a tape or floppy backup.

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**THE INDUSTRY'S ONLY CONTINUOUS HARD DISK BACKUP.**

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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-in-one 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 FC 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 down to 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 plus utensil is System 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, when and where". 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 286 icons ready to use.

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 library of 250 PostScript Type 1 (the best) display faces for use with any application that supports PostScript (including AITM). 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 appealing graphics for all your presentations, notices, memos and packaging. With such a wide variety of faces available to you, creating incredible headlines is fast, fun and impressively 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

PostScript fonts, ask for a free copy of a 24-page book that we've prepared entitled "A Short Course On Working With Type". This 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 library of 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 TypeStyler, 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? Changes 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!
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 dreading through hundreds-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,” it’s awarded 4-and-a-half mice by MacUser, 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 zooms (view and edit up to 100 pages), built-in database and mail merge, spell checked 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 other) — 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 foreground, leading, stretching, condensing and rotating of your type (in one-degrees 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 (stabilized 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 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 to help you 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 column and headings with sleek menus.

Zoom in out to adjust details.

HOMEWORK: $135.95
Are Macintosh running System 6 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 and simple 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 new 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.

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, "Work remains unparalleled, direct, 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 powerful.

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.

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). Features 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 tool box features, such as:

- lasso and magic wand, gradient tools, dropper, airbrush, paint can, a host of patterns and more.

- Image editing, including 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 grayscale images in no time.

- Those other paint programs told us that paint programs should be difficult to use — but that's not true anymore. In fact, working with Expert Color Paint is a breeze. Every tool menu and streamlined tools gives you complete control — without the learning curve. Touching 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 no problem.

Although Expert Color Paint is bustling 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 Airbrush, 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!!
Before you attempt 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 way to refresh, need to learn a set of words or phrases 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 Torture (Available for Spanish, French, German, Russian and Italian): A complete, automated vocabulary drill with up to 1000 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 Torture 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 learning a second language.) Create your own drills, see the words in random order and create your own customized vocabulary sets.

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 OCLl 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 computer displays. They're also in use on camera lenses, microscopes, scientific instrumentation and a host of other optical devices that require precise controlled light.

Screen glare is a major problem for anyone who uses a computer. It can cause eyestrain and may lead to health problems over prolonged exposure. Only OCLl Glare/Guard Profile Plus filters, with patented HEA technology provide definitive protection against these potential hazards. Why not use mesh screen or diffusing filters? You could, but they are far less effective than OCLl'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 OCLl's coated filters eliminate glare while improving sharpness of image quality.

Ten of the leading mesh, polarizing and coated and 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 OCLl 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 OCLl's Guard Profile filters use a unique non-conductive coating to eliminate the menace of static electricity. OCLl 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 precise controlled light.

Many products are labeled as anti-glare filters, but in fact, performance levels vary greatly. OCLl Glare/Guard filters are designed and manufactured to uncompromising quality standards by OCLl (Optical Coating Laboratory, Inc.) - the recognized leader worldwide in the design, development and manufacture of thin film optically coated products.
The 4,000 Year-Old Game Of Abstract Reasoning.

REVIEWER’S NOTEBOOK: While most of today’s popular computer games feature eight-headed dragons, impeneable 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 unlike both games demand a strategy, decisive attacks and a solid defense, Go allows weaker players to compete evenly with a unique handicap 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 you do not play the same way 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! Genius and Nemesis! Tactical Wizard, two grand master tutors that guide you to the peak in Go skills. Nemesis! gives you sequences of moves culled from centuries of play by the masters. By learning strategies of organized groups needing defense, territories into life and death confrontations with the enemy. Also includes Nemesis! Sfribbler, the documentation utility for your Go matches. Complete annotation capabilities for the serious Go student and advancing player.

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 and PINs in 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, lcx, Icl, lpi, l, Ic, lxl 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 unauthorized access. 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, and 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 easy-to-use software installs in seconds, provides multi-level password protection, and allows for multiple users, with each user having his or her own unique password. New passwords 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.

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 login, 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. For Floppy disk, one PassProof lock, two keys — with security tag on 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.

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SAME PRICE AS GROUND
Compress Files And Folders Up To 98%!

REVIEWSER'S NOTEBOOK: StuffIt Deluxe 20 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-Extracting archives and automatic launching of compressed applications 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 precious transfer time. Put the Magic Menu Extension in your System Folder and watch a new menu appear in the Finder. Now Stuff It 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 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 send their Email files without actually using the Email 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.

The Intelligent Desktop

REVIEWSER'S NOTEBOOK: Although OnCueill contains several individual features (each of which could be standalone products), one in particular caught our eye: On Startup. On Startup allows you to launch any application from the key­board, without opening layers of folders — 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 OnCueill alone — but there's much more...

OnCueill 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 OnCueill's unique Match­Maker feature. With it, you can launch files that have missing applications by assigning another application — any one you choose!

OnCueill 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 OnCueill'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 OnCueill takes care of the rest. All of which makes OnCueill 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 OnCueill's vast potential: it contains ten other time-saving features that users have screamed for. It's one product that does it all.
Now we’ve made it fast.

Introducing the TI microLaser™ Turbo printers: They race through sophisticated graphics software faster than other printers. 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.

*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.

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THIS MONTH:
New PowerBook Products
DOS Nets for Macs
3.5-inch Removable Drives
Adobe's Document-Publishing Plans

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 QuickDraw printer driver, and TrueType fonts. The printer is compatible with IBM PCs and can be adapted to work with Unix workstations. Seiko, 408/922-5800.—T.M.

Seiko Personal ColorPoint Printer from Seiko.

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.

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 multuser 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 developers 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, 303/994-2211.—D.L.
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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 MacDVI 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 Nic, at $22,500. All configurations include Macromind Director 3.0 through January.

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 Notebook Display Adapter 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 Adapter 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 $1795. The Envisio adapters are shipping now.

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 Solectek, 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. Solectek, 619/450-1220.

The EN/SC 1OT, an external SCSI-to-Ethernet adapter from Asante Technologies, connects the PowerBooks, or any Mac, to 10BaseT Ethernet. Shipped to ship in November, the EN/SC 1OT 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.

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 Nic, at $22,500. All configurations include Macromind Director 3.0 through January. New Video, 310/396-4000.—T.M.

TRED

Macs 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, 206/822-8080.—D.L.

Redesigned CAD

Three long-standing Macintosh CAD packages have come in for major upgrades recently. Computervision's VersaCAD lists for $699, and the LDPB 80's is $999. Both were scheduled for November availability. CMS, 714/222-6000.—T.M.

J U S T F O R F U N

Colorful Bugs for Your Floppies

A new company called Bugy's has created a new way to get bugs—or 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. "Hmmm, 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 $63.88. Hey, fun is definitely not cheap. Bugy's, 415/332-9577.—T.A.

A FEW OF THE IMAGES ON BUGY'S COLORFUL LABELS FOR FLOPPY DISKS.
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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

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.

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 Macintosches, 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.

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 5½-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.

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
DataPak™ Removables
More Storage, More Choices

Macintosh storage solutions from MASS Microsystems™. That’s what MASS Media means. And our DataPak removables give you more storage and more choices than ever before.

Selection Choose a DataPak model to meet your individual needs. With footprints to match your Macintosh, DataPak 45 and 88 drives provide hard disk performance. Or choose our DataPak MO optical drive with 512 megabytes per cartridge. Whether you’re archiving large files or need network backup, DataPak MO gives you the most cost-effective optical storage available.

Now available for Quadra 900:
DataPak 45i and 88i Internal Drives

Infinite Storage With DataPaks you never run out of storage. Each removable cartridge packs up to 45 or 88 megabytes of hard disk storage, or 512 megabytes of rewritable optical storage. Need more? Just buy another cartridge.

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Circle 207 on reader service card

The MASS Microsystems Edge
With more industry awards for removable storage, and as the first Macintosh-only public corporation, MASS Microsystems is one company you can count on. With dealers and distributors worldwide, up to 2-year warranties, next-day repair, and toll-free technical support, we’re there when you need us. For a free demo disk, or the name of a dealer near you, call toll-free

800-522-7979.
**B U G  R E P O R T**

**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.

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**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 voxels—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.

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**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

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**Microsoft** will ship WordBasic 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.

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**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 bibliographic software that runs inside Word.

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**The Power to Be Her Best?**

KOKO HAMMERS OUT A SENTENCE ON HER GORILLA-FRIENDLY MACINTOSH.

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**ENDNOTE COMMANDS APPEARING IN MICROSOFT WORD 5.0’S MENUS.**

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**MACWORLD** February 1992 191
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.

No more need to print hard copy first. No more trudging to the fax machine, waiting in line, or standing there feeding in paper.

If you only send faxes now and then, the silver Sendfax seal means you'll get all the advantages of instant, direct faxing on your data modem at little or no extra cost. If you're a frequent faxer, go for the gold. For a few dollars more, it's so fast (9600 bps) it can pay for itself the first few times you use it. By programming faxes to go at night rates, you'll save 40% or more on your phone bill. If you send a lot of long distance faxes, that adds up fast. And since modems don't wear out, it will add up for a long time.

Sendfax is available on the best quality data modems through your local computer retailer or direct mail marketer.

For the location of the Sendfax dealer nearest you, call 800-338-7554, extension 501

Dealer inquiries regarding the Sierra Sendfax program are invited. Call 800-338-7554, extension 801

SIERRA SEMICONDUCTOR
2075 North Capitol Avenue, San Jose, California 95132
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 IIDD 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 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.

DESKTOP LIBRARIAN
Beginning Mac Books
This month we look at books written for newcomers to the Mac.


- 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, 617/994-3700.

- 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.

STREETS OF SAN FRANCISCO: ATLAS PRO CAN LOCATE AND SELECT SITES BY THEIR STREET ADDRESS.

Relisy Monitor Works with Macs and PCs
The Model RE-1422 from Relisy is a 14-inch multisampling VGA monitor that continues to maintain an internal database and provides spreadsheet-like 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.
Use your IQ to write your fax,

Vanna

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
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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.

And if you want the best reliability, ask an astronaut what they use. NASA just sent a PSI fax modem into orbit with the shuttle. So if you want the best fax modems in and out of this world, call PSI at 1-800-622-1722. And spend your energy creating faxes—not sending them.

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"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 Chinen 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 Chinen drive."

Chinen drives are available in external versions for both IBM-compatible and Macintosh computers, and a half-height internal version for IBM compatibles.

Experience Chinen'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.
TRENDS

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.

MacVonk’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. MacVonk, 408/973-7100.—T.M.

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.

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 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.—Carolyne Bickford
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Requires Apple Macintosh with at least 2 megabytes of memory and hard disk. Works with Plus, SE, SE/30, II, IIc, IIgs, IIfx, IIGS, Portable, Classic, Classic II, Powerbook 100, 120 & 170, Quadra 700 & 800, and 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 Mac Bulletin, 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 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.

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.

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: 6/91
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 system 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.

This month's survey was mailed to 750 readers; 398 usable responses were returned.
Hayes Personal Modem 2400 Plus with Smartcom
- The Hayes Personal Modem 2400 Plus provides you with everything you need to go online. 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 VTY and V752/620, to make it more familiar and easy to use. The transfer protocols include XMODEM and MacInTalk.
- Manufacturer: Hayes
- $149

FoxBASE+/Mac 2.0
- Combines the flexibility of the dBase IV language, the speed of Foxbase+, and the berylely Mac interface. Runs all your dBASE III plus programs on the Mac, without requiring you to change a single line of source code. In STB 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 HyperTalk external functions and commands (MacOS and MacOSx). Manufacturer: Fox Software
- $295

PacerTerm
- Combines today's standards - Communication Toolbox and HyperTalk - creating 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 VT100 terminal windows let PacerTerm users create powerful front ends to host applications and on-line services. COM1016 $159.
- Publisher: Pacer Software
- $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
- $195

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, map, business symbols, communications equipment, computers, hand symbols, backgrounds, arrows, logos and more. ClickArt Color Graphics for Presentations is available in PICT/II format for the Macintosh and works with: Aldus Persuasion®, MS®, PowerPoint®, Quattro® Presentations™, or any other application that imports PICT files. Publisher: T/Maker
- $109

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.
- $29

Instant Update
- Instant Update™ is a breakthrough collaborative application for Macintosh networks that helps you communicate through documents. Create the document just like any word processing document, 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: OnTechnology
- $149
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: FreeSoft

COM00056

$85

BluePrint 2.1

* BluePrint makes 2D drafting and design easy. It has a hierarchical symbol library, automatic alignment, auto-dimensioning, and edit 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 DXY translator. BluePrint also exports EPS files.

Publisher: Graphisoft

CAD0024

$219

WordScan

* WordScan offers the same OCR capabilities as WordScan Plus but does not include the more advanced features. UT00215

$29.95

* WordScan Plus offers accurate OCR with a wealth of user conveniences. Special dictionaries help WordScan read pages after other software can't read. It even reads faxed documents and drafts quality dot-matrix output. Deferred Processing allows you to scan now and process later. Advanced features include: Pop-Up Image Editor, Auto-Lighting and Side-Sheets Publisher: Electra Recognition Systems

UT00216

$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 simple. 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

LNG0051

$199

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Application - System 7 users can switch among open applications by clicking on files on your desktop. Plus much, much more.

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 # AAA0013 when you order.

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Accountant, Inc.

- 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? design means you can customize your forms, reports and print options by just clicking on your favorite forms, design, spreadsheet and data base programs.
- Get invoicing, Accounts Receivable, Inventory, Accounts payable, Check Writing, General and Payroll. Accountant. Inc. is available in single and multi-user versions. Publisher: Softbyte/BIG/FRN 1100448

- $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 INT portion acts like a watchdog during startup to detect a variety of viruses. The 3.0 edition runs 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 Scan. Publisher: Symantec

- $65

Targus Universal Notebook Carrying Case for the Mac

- Designed especially for the new generation of Notebooks. The Targus Universal Notebook Carrying Case provides a convenient way to secure your computer and accessories. Two padded compartments (11x15x2.5 inches) keep your Notebook computer and accessories separated. Non-skid rubber feet, rugged Corner Guards, and self-healing nylon zipper top to it. Manufacturer: Targus

- AC00675

- $195

PowerCache

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- For use combination of Rapport and Kermit's Drive 2.4 (1.6 MB) or Drive 1200 or Drive 300 (5.25"). 1200 or Drive 300 (5.25) to read, write and format all Mac and IBM formats on your Macintosh. Or use Rapport alone on older Macs to read IBM files from your internal drive. Manufacturer: Kermit Technology

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- Get HAND-Off II for fast, easy file access. "SuperMenu" for boot-up makes any menu hot and ready. Insert a memory card or use an existing menu to boot-up. Handles unlimited number of files, folders, applications or places hierarchically. "Screening" for entering passwords or signing on to other systems. "On-the-fly" application substitution eliminates the repeated "Application" Not Found error messages. Application icons remain in memory.HAND-Off II reduces memory deep and sound level automatically. "Antidote" provides a convenient way to secure your computer and accessories. Two padded compartments (11x15x2.5 inches) keep your Notebook computer and accessories separated. Non-skid rubber feet, rugged Corner Guards, and self-healing nylon zipper top to it. Manufacturer: Targus

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The UnMouse

- The UnMouse does everything a mouse can—easier, faster, 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 a small graphics tablet. Manufacturer: Microtouch

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- $40

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- 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: Nordic Software
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MAXIMA 2.0
- Millions of users! MAXIMA 2.0 extends your RAM access to as much as 128MB. Create a powerful on-line database with your RAM disk. Lists: Stores. System crashes. Restarts, and standards. Use the RAM disk to reduce boot time, accelerate many routine operations, and extend your hard disk.
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DiskDoubler 3.7
- DiskDoubler 3.7, the system 7 ready 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 DiskDoubler application. DiskDoubler 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. DiskDoubler works with documents, applications, plus sound, graphics, and scanner files. Publisher: Salient Software U10187
- $49

Design Your Own Home:
- Design your own house: Architecture, Interiors, Landscape. Create floor plans and building plans with structural details. Design individual rooms plans and kitchen/bath design. Then complete your dream house with graphic landscape plans. Interiors and landscape programs generate a side view from top view perspectives. Sample plans included. Publisher: Advanced
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- "It's slick, fast and safe. I highly recommend it." MacUser April 1990. Protects your hard drive and programs from unauthorized access (excluding security tapes with a row in diskette), copying and erasing applications and file folders (including encrypted folder) from unauthorized access, deleting, and for illegal copycat. Desktops (including system folder) from destruction by unauthorized user. You can run FileGuard from the system using a floppy which commonly tracks multi-group security on your computer. Publisher: ABD Software Office 5 Pack UT01230 $599. Office 10 Pack UT0135 $799
- $139

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- All Ultimate style carrying cases are designed with the same high quality standards as other MacLuggage™ products. The "Ultimate" Classic case (padded closed) offers padded internal compartments for keyboard, external drive, mouse & cords. The Classic Extended case (padded open) offers these same features plus an internal 90X93 padded peripheral pocket. Both models offer two external pockets for everything from disks to umbrellas. Features include a sturdy compact case, 1/2" high density foam padding, and a LIFETIME WARRANTY and you'll see why these are the "Ultimate" carrying cases for your Mac. Available in navy blue and black. Manufacturer: I/O Design, Inc. Ultimate Classic ACC0929 $55. Ultimate Classic Extended ACC0940
- $85

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- $49
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(Ask for item # A4400012 120NS)

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 for a total of 4MB. Or, you can install a 2MB Expansion Board, which brings your Mac Classic up to its full 4MB.

The Mac Plus and Mac SE have four available slots on the motherboard, which originally contain four 256K SIMMs modules. You can replace each 256K SIMM module with a 1MB module, but you must do the work. Before you add 1GB to your Mac Plus and you will have a total of 256MB of memory. (That's the two new 1MB modules in the original four SIMM modules.) Replace all four modules and your Mac Plus will have 4MB. You should have our SIMM Installation Kit (or if you want to pass the task on to someone else.)

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 10MB, depending on whether you are using 1MB, 2MB or 4MB SIMMs. If you are upgrading a Mac LC, you must use SIMMs rated at 60ns or faster.

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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.

Create impressive layouts effortlessly

Once you've collected all your data and analyzed it, you probably need a meaningful way to explain it to other people. Lotus 1-2-3 Mac makes that whole process easier than ever. You can move elements around to create a layout that will make the data — and your analysis — crystal clear. Re-size and re-format graphs. Restructure drawn objects and text blocks. Add copy to explain key elements or draw conclusions. Draw circles and arrows, or create illustrations with the drawing tools. With Lotus 1-2-3 Mac, you've got all the tools you need to be sure your important points don't get lost in the numbers.

Edit data right within the cell

If you're like most spreadsheet users, it probably takes you a minute to remember that you need to be on the command line when you enter or edit data. With 1-2-3 Mac, that's never a problem. You can click on a cell and make the changes directly and immediately, right within the cell. This easy, natural way to work with data, text, and formulas makes everyday use of Lotus 1-2-3 Mac easier and more efficient than ever before.

Break the time barrier with 3-D worksheets

Why jump through hoops to compare last month's data with the current month, or with the projections for next month? Just use the true 3D stacking capability of Lotus 1-2-3 Mac. This unique feature not only lets you compare results, but also enables you to perform calculations up and down the stack. You'll find this capability a great time saver, especially when you're building a business plan extending over a long period of time, or consolidating spreadsheets.

Easy access to remote databases

Do you need to download data from a database on a mainframe or minicomputer? Lotus DataLens technology and Apple Data Access Language work together to let you query remote databases as if they resided in your worksheet. So you'll spend your time analyzing and making informed decisions from your data, instead of trying to gain access to it.

“Classic” 1-2-3 commands at your fingertips

You'll feel comfortable using Lotus 1-2-3 Mac, no matter what spreadsheet experience you have. Lotus 1-2-3 Mac takes full advantage of the intuitive Mac interface to make using its spreadsheet, graphing and communications capabilities a breeze. If you learned 1-2-3 on a different platform, you can use the Classic Menu to access all the commands you already know with the press of the slash key. Plus Lotus 1-2-3 Mac is compatible across platforms, and offers full network support.

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Circle 10 on reader service card
Descriptive Publishing Diversifies

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 Puses, 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
varies: costlier programs provide finer kerning than low-end ones. You also pay more for tracking, a feature that adjusts word spacing and letter spacing 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. 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.

**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 PressEdge,” 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 arcane; 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, book, 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

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 each. Publish It Easy supports fewer file formats than does Personal Press and has problems importing and printing grayscale TIFF files unless you allocate roughly 2MB of memory to the program. Its grayscale-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 gnat, but version 1.01 performed well for me.)

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 your 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 the left and right master pages, which hold page numbers and other elements that appear on each page.
ENTRY-LEVEL PROGRAMS

<table>
<thead>
<tr>
<th>Program</th>
<th>Price</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Aldus PrePrint</td>
<td>$299</td>
<td>Entry-level program for Macintosh, with a focus on ease of use and integration with other applications.</td>
</tr>
<tr>
<td>QuarkXPress</td>
<td>$795</td>
<td>Power word processing and layout program, with advanced features like manual kerning and automatic hyphenation.</td>
</tr>
<tr>
<td>Ventura Publisher</td>
<td>$795</td>
<td>High-end layout program for Mac, offering advanced features and powerful text manipulation capabilities.</td>
</tr>
<tr>
<td>PageMaker</td>
<td>$99</td>
<td>Lightweight layout program for Mac, offering basic features like type and image manipulation.</td>
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MAINSTREAM PROGRAMS

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<tbody>
<tr>
<td>QuarkXPress</td>
<td>$999</td>
<td>Full-featured desktop publishing program, with advanced features like automatic hyphenation and automatic kerning.</td>
</tr>
<tr>
<td>Ventura Publisher</td>
<td>$999</td>
<td>High-end desktop publishing program, with advanced features like automated indexing and automatic hyphenation.</td>
</tr>
<tr>
<td>PageMaker</td>
<td>$299</td>
<td>All-around layout program, offering a balance of features and ease of use.</td>
</tr>
<tr>
<td>FrameMaker</td>
<td>$999</td>
<td>Advanced layout program, with powerful features like manual kerning and automatic hyphenation.</td>
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LONG-DOCUMENT PROGRAMS

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</tr>
</tbody>
</table>

For a complete list of the best desktop publishing programs, check out the latest issue of Macworld.
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 minimise 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.

Lettrosset 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 Letrasett, 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 a hard disk—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, footnote, 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 authors to create tables in which a user can select a subject and have similar information displayed.
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 processors, incorporating such details as whether paragraphs should be numbered or bulleted according to one of dozens of schemes.

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**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.

**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' 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 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.

See Where to Buy for contact information.

**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-Docum ent 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: Aldus Corporation. List price: $795.

**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.**

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**MACWORLD February 1992 213**
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 call 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 spellchecker 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 Xtsension 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 scripts 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 additions developers to convert their wares to the PC version.

**Shopping for Add-Ons**

"UTILITY DIRECTORY" LISTS ADDITIONS, 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 pro-vide routines developers can use to write programs that enable users to log into and out of a network publishing system, track story revisions, histories, and more. These products are both scheduled for delivery in the second quarter of 1992.

Quark has the edge in numbers, but whose extensibility 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...
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 PageMaker 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. [n]

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.

MACWORLD February 1992 217
Seeking Midrange HARD DRIVES

You may be startled to realize that midrange 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.

Getting 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 Rodine Systems Cobra)—with drives at both ends of the price range using the exact same drive mechanism.

Macworld Lab tests 44 external hard drives from 120MB to 220MB

BY BRUCE F. WEBSTER

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 took: 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 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 1755, and PWB PocketHammer 200 (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

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</tr>
<tr>
<td>Pd</td>
<td>PL Turbo</td>
<td>$210/$279</td>
<td>$250/$330</td>
<td>120/170</td>
<td>Speed: 2x10</td>
<td>50-pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procom Technology</td>
<td>Procom</td>
<td>$210/$279</td>
<td>$250/$330</td>
<td>120/170</td>
<td>Speed: 2x10</td>
<td>50-pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relax Technology</td>
<td>Vista</td>
<td>$210/$279</td>
<td>$250/$330</td>
<td>120/170</td>
<td>Speed: 2x10</td>
<td>50-pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rodime Systems</td>
<td>Cobra</td>
<td>$210/$279</td>
<td>$250/$330</td>
<td>120/170</td>
<td>Speed: 2x10</td>
<td>50-pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Dimensions</td>
<td>MaxiStor ZFP</td>
<td>$210/$279</td>
<td>$250/$330</td>
<td>120/170</td>
<td>Speed: 2x10</td>
<td>50-pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Wave Computing</td>
<td>Third Wave</td>
<td>$210/$279</td>
<td>$250/$330</td>
<td>120/170</td>
<td>Speed: 2x10</td>
<td>50-pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Peripherals</td>
<td>TP</td>
<td>$170/$229</td>
<td>$210/$279</td>
<td>120/170</td>
<td>Speed: 2x10</td>
<td>50-pin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 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
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 buying 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 companies 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

<table>
<thead>
<tr>
<th>Hard Drive Speed Tests 120MB–220MB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color Key</strong></td>
</tr>
<tr>
<td>Fastest</td>
</tr>
<tr>
<td>1.00</td>
</tr>
<tr>
<td>Percent slower than fastest</td>
</tr>
<tr>
<td>Up to 10%</td>
</tr>
<tr>
<td>11%–20%</td>
</tr>
<tr>
<td>21%–29%</td>
</tr>
<tr>
<td>30% or more</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Duplicate (in seconds)</th>
<th>Open (in seconds)</th>
<th>Save (in seconds)</th>
<th>Search (in seconds)</th>
<th>Compile (in seconds)</th>
<th>10.00</th>
<th>10.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWB PocketHammer200 (Q)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.27</td>
<td>1.48</td>
</tr>
<tr>
<td>MacTel Index 210 (C)</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>1.27</td>
<td>1.48</td>
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<tr>
<td>Storage Dimensions MaciStor 205-ZFP (M)</td>
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<td>0.97</td>
<td>0.97</td>
<td>0.97</td>
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<td>1.59</td>
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<tr>
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<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
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<td>1.59</td>
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<td>0.96</td>
<td>0.96</td>
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<td>1.59</td>
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<td>Optima Diskover 200 (U)</td>
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<tr>
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<td>0.94</td>
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<td>0.94</td>
<td>0.94</td>
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<tr>
<td>APS 210 (Q)</td>
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<tr>
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<tr>
<td>Cutting Edge 210 (C)</td>
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<td>0.93</td>
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<td>1.59</td>
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<td>0.93</td>
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<tr>
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<td>0.89</td>
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<td>1.59</td>
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<td>0.88</td>
<td>0.88</td>
<td>1.43</td>
<td>1.59</td>
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<tr>
<td>Cutting Edge 170 (Q)</td>
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<td>0.88</td>
<td>0.88</td>
<td>1.43</td>
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<tr>
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<td>HDI PowerDrive 210 (Q)</td>
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<td>0.88</td>
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<td>DKI 213 (M)</td>
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<td>HDI PowerDrive 213 (M)</td>
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<tr>
<td>La Cie Tsunami 120 (Q)</td>
<td>0.86</td>
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<tr>
<td>MicroNet MS 200 (M)</td>
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<td>Rodime Cobra 210 (M)</td>
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<td>1.59</td>
</tr>
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<td>ETC DataPort 210 (Q)</td>
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<td>1.43</td>
<td>1.59</td>
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<tr>
<td>APS 200 (M)</td>
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<td>0.82</td>
<td>1.43</td>
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<td>0.81</td>
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</tr>
<tr>
<td>MacProducts USA MagicDrive 170 (Q)</td>
<td>0.81</td>
<td>0.81</td>
<td>0.81</td>
<td>0.81</td>
<td>1.43</td>
<td>1.59</td>
</tr>
<tr>
<td>La Cie Tsunami 170 (Q)</td>
<td>0.80</td>
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<td>0.80</td>
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<td>1.43</td>
<td>1.59</td>
</tr>
<tr>
<td>CMS Platinum series 200 (WVD)</td>
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<td>0.78</td>
<td>0.78</td>
<td>1.43</td>
<td>1.59</td>
</tr>
<tr>
<td>APS 120 (M)</td>
<td>0.78</td>
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<td>0.78</td>
<td>0.78</td>
<td>1.43</td>
<td>1.59</td>
</tr>
<tr>
<td>Total Peripherals TP 210 (Q)</td>
<td>0.77</td>
<td>0.77</td>
<td>0.77</td>
<td>0.77</td>
<td>1.43</td>
<td>1.59</td>
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<tr>
<td>Liberty 50 series 120 (Q)</td>
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<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>1.43</td>
<td>1.59</td>
</tr>
<tr>
<td>Total Peripherals TP 170 (Q)</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>1.43</td>
<td>1.59</td>
</tr>
<tr>
<td>Storage Dimensions MaciStor 120-ZFP (Q)</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>1.43</td>
<td>1.59</td>
</tr>
<tr>
<td>Relax Vista 180 (F)</td>
<td>0.65</td>
<td>0.65</td>
<td>0.65</td>
<td>0.65</td>
<td>1.43</td>
<td>1.59</td>
</tr>
</tbody>
</table>

Page 222 | February 1992 | MACWORLD
Ancillary Issues

Finally, there are the odds and ends that make a product 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.

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 MacStor 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.

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 Hudlow.

When Disk Speed Matters

Task

<table>
<thead>
<tr>
<th>Speed matters most</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Photoshop document</td>
</tr>
</tbody>
</table>

Percent of time taken by disk access

<table>
<thead>
<tr>
<th>Task</th>
<th>Low %</th>
<th>High %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Photoshop document</td>
<td>71 / 83</td>
<td>69 / 78</td>
</tr>
<tr>
<td>Duplicate 3.2MB file</td>
<td>55 / 67</td>
<td></td>
</tr>
<tr>
<td>Save PageMaker document</td>
<td>56 / 71</td>
<td></td>
</tr>
<tr>
<td>Duplicate 10MB file</td>
<td>46 / 60</td>
<td></td>
</tr>
<tr>
<td>Open Word document</td>
<td>42 / 59</td>
<td></td>
</tr>
<tr>
<td>Open PageMaker document</td>
<td>38 / 51</td>
<td></td>
</tr>
<tr>
<td>Compile ThinkC program</td>
<td>24 / 40</td>
<td></td>
</tr>
<tr>
<td>4th Dimension search</td>
<td>9 / 18</td>
<td></td>
</tr>
<tr>
<td>Open Excel document</td>
<td>50 %</td>
<td></td>
</tr>
</tbody>
</table>

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 IIGS 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

Another 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.
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 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 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 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 NTI, to maintain...
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 boards 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
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, lets 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, Soleto 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.

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 Synch-Routers, 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 64,000-8ps connection using a hardware router approximately matches an individual’s share of a 232,000-8ps 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.

See Where to Buy under Digital Data for contact information.

Year in Review

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...

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

Award for Best Subliminal Message
Did Apple really intend to show the mouse in this ad connected to IBM's Atlanta headquarters?

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

Top Ten
Bill Gates Epithets

- Forbes: Cocky Bill Gates
- Forbes: Second Richest Man in the U.S.
- Fortune: Longtime Wunderkind
- 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 Ile 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

The Macintosh in Cartoons

"We have them handmade for us by a little old lady in Ireland who designs the patterns on her Mac computer."
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?

Actually, he runs the accounting department; his brother is in tech support.

We assume she had to check some luggage.

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

IBM-Microsoft rift
Gassée announces Be Labs
Sculley preannounces PowerBooks
LC, sl, Classic announced
Q4 share earnings decrease 35%, revenues up 5% for fiscal '90
Apple Customer Assistance Center opens
Spindler made president
Graziano, Spindler, Eisenstak named EVPs
Apple stock index
Computer Industry Index

Lotus abandons MarketPlace
Apple Q1 revenues rise 12%
New York Times says Classics in short supply
Apple Ethernet products: X Windows 2.1
Spindler made president
Graziano, Spindler, Eisenstak named EVPs

Sculley announces a kinder, gentler Apple
LC, fx, SE/30 prices drop 31%
StyleWriter, Personal LaserWriter are introduced
FTC discloses Microsoft investigation

First lob in Lotus's history
Ashton-Tate announces $5.8 million loss
Machintosh Portable reintroduced
Microsoft-Compaq-DEC RISC alliance

Apple reorgs, 3 new groups: OOP, consumer, enterprise
Final beta of System 7.0
Macintosh for Kanji input shown
Apple adds Macintosh Portable on a plane.

Gassee announces Be Labs
Sculley preannounces PowerBooks
LC, sl, Classic announced
Q4 share earnings decrease 35%, revenues up 5% for fiscal '90
Apple Customer Assistance Center opens
Spindler made president
Graziano, Spindler, Eisenstak named EVPs
Top Stock Sellers

(Dollar amounts from Apple stock sold during 1991)

- Mike Markkula: $20.56 million
- Albert Eisenstat: $10.91 million
- Ken Scully: $9.35 million
- Kevin Sullivan: $4.32 million
- Peter Crisp: $2.22 million
- Soren Olsson: $2.06 million
- Joseph Gasztino: $1.43 million
- Fred Foryth: $1.44 million
- Ian Devry: $1.14 million
- Edward Stead: $0.80 million
- Joseph arena: $0.67 million
- John Moon: $0.58 million
- Michael Spindler: $0.51 million

Cache Switch

Processor Cache:

- 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.
YEAR IN REVIEW

Headlines of the Year

Maybe that's what happened to 1-2-3!1,11.114.11141

We understand the missile strike, and open season on pirates, but what's the deal with the snake attack?

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.

System 7.0 heralds new era at Apple

Software sets path for future

Sony to Supply Apple Computer With Portable PCs

BY JACOB M. SCHLESINGER
Staff Reporter of THE WALL STREET JOURNAL

Best Kept Secret of the Year Nomination: Sony-Apple Deal

Yo! We've got the "do more" part down. Could you explain the "work less" part to us once more?

Apple Like Ghost Town in Face of Layoffs

Jeez: With new eras like this we may never ship system software again.
The Mac in Film

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.


Yuppie Puppy Dog Care
At last, someone actually using a Mac. Yuppie dog care center with Mac.

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?

The Power to Crush Other Kids
Truth in Advertising Award to “Saturday Night Live” for its satire of a MacIntosh ad.

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.
LETRONIC 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
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 in critical areas: it was the fastest E-Mail product in sending messages with enclosures and most consistent in processing simultaneous clients—important 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
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, comes 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 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 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: E2LGate:Fax:801-555-1234/cover page.3 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.)
OPENING UP E-MAIL

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.

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 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

Selected CE Software's QuickMail 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 problem 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 (AEIAM) 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 AEIAM 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 Rosiur and Charles Piller
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 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, GE 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 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.

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.
New tools mean instant fame.

In the future, it is said, everyone will be famous for 15 minutes.

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

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 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-
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 an 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 hardware 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 the 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

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.

Apple’s SimplePlayer Apple’s SimplePlayer allows you to play back QuickTime movies created in a number of programs.
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 stripping and improved image quality through oversampling. High-end systems, like those from Digital FX and Avid Technology, provide more sophisticated video editing capabilities including frame accuracy with SMPTE (Society of Motion Picture and Television Engineers) time-code stripping (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 walking 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 MediaBlender (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.

**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 24KLT V 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 and record video and sound in ratios of up to 160:1 using DVI, Intel’s video-compression and playback technology. Digital FX/Video 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.
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 Loitke 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 Sakhija 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.

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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 lathing 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
three programs are adequate for entry-level modeling.

In contrast, MacroMind/Paracom’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. VIDP’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 auto-desys’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.

**TRULY USEFUL, BUT RENDERING TIMES ARE STILL SLOW**
Making a Model Realistic

Artist Jim Laditke 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'Poo's Falini 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 Vals 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.

**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 reflection 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 color 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.
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 rotate 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).

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 programs, 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 over where to apply a texture. Sculpt also offers incredible power—you can apply a different texture to every face of a model. ElectricImage Animation, Sculpt 3D and 4D, and Infiniti-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 Thre3-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
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, 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. MacRenderMan'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)
I contain these futures. Swivel Man is a bundle of future operations provide three ways to shape to modify another. These 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.

**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.

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 anti-aliasing 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.
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 [1/4] 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 MacRender-Man-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.**

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, Infiniti-D, StrataVision 3D, 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, Infiniti-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). Infiniti-D’s metamorphosis is extremely powerful, allowing you to animate from one block of 3-D text to another. MacTOPAS and Sculpt 4D let you animate between two or more predeterimned 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 MacTOPAS 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. Infiniti-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.
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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 A SCAN DEVICE FROM A MENU AND LET THE PROGRAM HANDLE THE REST, WITH OFOTO PLUGGING IN OPTIMAL TONE-CORRECTION 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 characteristics 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.

[Image of Tone Correction: Laser-printouts before (top) and after (bottom) calibrating for the printer.]

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 ONE SCANNER 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 estate 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 bargain 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

[Box: LaserPrinter]

LaserScript LX

PROS: Automatic emulation switching; good-quality resident fonts; easy assembly; helpful LCD displays; good performance for the price. CONS: Slow; heavy; pricey; downloaded fonts; expensive supply-replacement costs. COMPANY: Abaton.


BATON'S LASERSCRIPT LX IS the new version of the original LaserScript, which received a midddling 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 $495), and was clearly faster than the Hewlett-Packard LaserJet III (S3395). 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

MACWORLD February 1992 257
How Fast Is the LaserScript LX?

Times are in seconds.

<table>
<thead>
<tr>
<th>Model</th>
<th>Courier</th>
<th>MacDraw II</th>
<th>FreeHand</th>
<th>Newsletter</th>
<th>Fonts</th>
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<td>256.4</td>
<td>824.0</td>
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<td>115.1</td>
<td>438.0</td>
<td>163.7</td>
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</table>

Despite Abaton's claims that the LaserScript LX outperforms the LaserWriter INTX, in comparison tests, the LaserWriter II (the INTX's successor) was considerably faster and had better-quality print and graphics. The LaserWriter, using the Microsoft Bauer PostScript interpreter, produced heavier and lower graceful versions of the typefaces tested (Optima, New Baskerville, and Nofer). The LX's typefaces will satisfy most users, but not type connoisseurs.

The LaserScript LX is 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 II ($3999) and Ill ($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

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 
LIST PRICE: $4999

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-

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 an 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
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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 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 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 counter-balance the PowerBook.

It was while commuting that I had the most trouble with the trackball. Tiring 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 Apple's, 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
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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

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**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) 725-7655.

**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 $995.

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**Getting and Spending**

When you decide to buy a list, MarketPlace will show you the data (another process in itself) and then present the results. You can then call up a summary of the information that is available, or to help you make strategic business decisions. A preview or analysis of an unreviewed list displays only basic information (business name, city, state, zip code, SIC code).

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**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
When we introduced our first desktop scanner, we set a standard by which all others are judged. Now, with the new Nikon LS-3510AF, we've managed to set an even higher standard by bringing you a better, faster 35mm scanner. For less.

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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: Insufficient 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 (305/992-1530). REQUIRES: Mac Plus; 2M 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: Insufficient 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 flyer 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 to 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 IIi, or are running System 6.0.7 and have a MacroMind/Paracomp MacRecorder, you can record sounds directly into collection pages. Mariah also can 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 D 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 true, 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 the Multi-Ad Search's proprietary Clipboard format, FTC1. Rather than hold a copy of the image in RAM, FTC1 points to the image's location on disk. At present, Multi-Ad Creator and QuarkXPress support FTC1.

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 are not on any volume in the catalog. If you 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 throws the catalog immediately after opening it. You must first issue a search command (all files, file names containing the word true, 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.

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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 losses 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 working 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 string within the images' comment boxes. But PictureBook+ excels in exporting graphics and in price.

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[FEATURES]

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>XANTE ACCEL-A-WRITER</th>
<th>HP LASERJET LBP/HBP</th>
<th>APPLE LASERWRITER RG</th>
<th>GANS®</th>
<th>LASERMASTER®</th>
<th>DOP PERSONAL TYPESETTER</th>
</tr>
</thead>
<tbody>
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<td>600 x 600 dpi</td>
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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

Fractal Paint Program

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 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 precut frisket. Ironically, while all the pre-cut 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

FRAC TAL 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.

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.)
Hard Disk Toolkit 1.0

**PROS:** Comprehensive; universal disk-drive formatting; terrific benchmarking capability.

**CONS:** May be risky in inexperienced hands. **COMPANY:** FWB; **REQUIRES:** Mac Plus; System 6.0.2. **LIST PRICE:** $199.95.

Hard Drive Utility Package

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.

**REVIEWS**

**HARD DRIVE UTILITY PACKAGE**

**PROS:**
- Comprehensive.
- Universal disk-drive formatting.
- Terrific benchmarking capability.

**CONS:**
- May be risky in inexperienced hands.

**COMPANY:** FWB; **REQUIRES:** Mac Plus; System 6.0.2. **LIST PRICE:** $199.95.

**SYSTEM DIAGNOSTICS TOOL**

**HELP 1.0**

**PROS:**
- Thorough report on-screen.
- Can run simulations for different system software versions.
- Finds duplicate programs.

**CONS:**
- Does not report details of incompatibilities.
- Knowledge base contains some errors.

**COMPANY:** Teknosys; **REQUIRES:** Mac Plus; hard drive; System 6.0. **LIST PRICE:** $149; 10-pack $795.

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 IICl had 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.
**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.

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 predefined 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.

**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.  
**LIST PRICE:** $89.95.

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 Power-Up. There is also a format that makes 3½-by-4⅛-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-tabbing 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 crew members; his camera people 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. In the data-entry window, 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.

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 QuickDial 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**

<table>
<thead>
<tr>
<th>Address Books</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DynoDex</strong></td>
</tr>
<tr>
<td><strong>Address Book</strong></td>
</tr>
<tr>
<td><strong>2.0.4</strong></td>
</tr>
<tr>
<td><strong>Plus 2.0</strong></td>
</tr>
</tbody>
</table>

**File size after import:** 129K  
**Import 1000 records:** 46  
**Sort 1000 records:** 13  
**Open application:** 11  
**Open DA:** 8  


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**

February 1992 *MacWorld*
Even the most complex multi-media presentations run smoothly with the Sharp QA-1050. Its 185,000 colors and TFT Active Matrix Technology guarantee computer and video images of unparalleled realism. And animated graphics and live-action sequences that move without ghosts and shadows.

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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). REQUIREMENTS: 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, 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 trials 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 fonts. 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 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
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 use it productively to help create 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 something 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 calls of an exotic rain-forest bird, or the whoop-whooop 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 environmentally 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

Glider 4.0

**PROS:** Very entertaining; excellent graphics; supports joystick; multichannel sound; includes game editor. **CONS:** Manual needs polish; 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 cutters. 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 whoshoshed 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 gamesters 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 gamesters 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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PageBrush Color for the Mac

PROS: None.  
CONS: Badly, 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 handler," 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 20 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 DiskDoubler 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. After 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

Verbum Interactive 1.0

PROS: Beautiful graphic design; clear navigational structure; innovative interactive video readable.  
CONS: Very slow; uneven quality; interaction limited to non-sequential reading.  
COMPANY: Verbum Interactive.  
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'Clicko, 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 Roundtable" 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
Microtech's new Nova N900i is the largest capacity internal drive now available for the Macintosh in a 3.5" form factor. With an 11ms access time, the N900i complete with Norton Utilities for the Macintosh, LifeGuard by Visionary Software, and a five year limited warranty, is the ultimate internal drive for the Macintosh Quadra 700.

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Circle 80 on reader service card
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).

**Requirements:** 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 piece, segments fall off the conveyer 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 trouble-some 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

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). **Requirements:** Mac Plus; Mac II and 2MB of RAM for color; hard drive; System 6.0.5. LIST PRICE: $49.95.

3 in 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 brain teasers, jumbled-word games, and puzzles with a few elements 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
Everyone who uses a Macintosh ought to back up regularly. But most people don’t back up at all.

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**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 drive 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

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**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 Correlation, 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 (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 2.0 is one of the rare programs that accommodates both beginners and experts, an admirable effort indeed.—Charles Seiter
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A S A PIECE OF INTERACTIVE programming, Voyager's Michelagniol: 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, Michelagniol: 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 Michelagniol.

The Michelagniol 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 snippets 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, Michelagniol 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

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. The program can run into problems, however. Instant Update and MacWrite II, 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 documents (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, there are 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

MACWORLD February 1992
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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 menu; 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. AlarmuClock is now better-looking and easier to use. Screen Locker now offers a more detailed activity log. Profile 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 affect 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, Microsoft’s INTIPicker, 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

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 (603/274-2800). 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 PRINTPREVIEW—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 TO WORK WITH, AND WHETHER IT SHOULD SAVE AFTER A SPECIFIED NUMBER OF KEYSTrokes, MOUSE CLICKS, OR MINUTES.

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: EleveWare Corporation (206/457-9223). REQUIRES: Mac Plus. LIST PRICE: $179.95.

CHECKLIST 1.0 SHOWN 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 files, and warns you of font problems (fonts that you need to download, fonts not supplied or available, and bitmaped 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 abspage 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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OutNumbered 1.0

**PROS:** Customizable problems; good graphics. **CONS:** Game and math challenges are repetitive. **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 is 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.

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. —Louis Kohl

**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; over-priced. **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 drawing program, most artists acquire all the drawing 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 adds 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 gradient, a radial gradient, 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

**Format-Translation Utility**

**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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CODE MW292
In the early days, it was one of those hidden surprises built into the Mac by crafty Apple engineers: 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 camerasque ka-chunk 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, $39.95). 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 worried 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...
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.

**Snipper**

**THE YOUNG SHALL INHERIT THE MARKET:** 21-year-old shareware guru Andrew Welch wrote Snipper, part of QuickTools 1.0 (Advanced Software, $79.95). In features and look-and-feel, Snipper and Screenshott (for description, see “Screenshott” above) are practically identical. (Apparently the cross-pollination took place at Preferred Publishers, where the programs’ development paths overlapped at one time or another.)

Snipper, at 58K, is slightly more compact than Screenshott, and comes as part of an eight-utility set. In this case (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—but 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 Screenshott, Snipper, 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 disk file to create: a Canvas document, MacDraw Pro, or whatever. (Snipper 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**

**CONVERTING YOUR FINGERS TO HIT KEYSHIFT-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.)

**SnapJot 3.01**

**SNAPJOT IS AN F-KEY- AND DESK ACCESSORY-based capturer that can leave your screen shots on the screen.** (Ev smile.)

You press a key combination to produce the crosshair cursor, which you drag across the screen. What’s nice is that, 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-screenshot-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-menu programs, either, such as the one-click menu or the window-grabbing features, or the send-to-Scrapbook option. But mmh, boy, that leave-the-shot-in-a-window feature sure is slick.

**The Upshot**

**FOR VALUE, TIME SAVINGS, FLEXIBILITY, user-friendliness, and elegance, Screenshott takes the cake.** That means its clone, Snipper, 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.

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Contributing editor and software-manual writer DAVID POGUE ran out of available function-key combinations in early 1988.
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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 II* 13” RGB monitor. $599. Lifetime Memory Products, 714/969-2421, 800/233-6233.

6c OmniMedia
Flatbed 24-bit color and gray-scale scanner that scans transparent or reflective materials; back-lighting arm moves with and automatically redials standard 9401 or 9446 printers. $10,400. Division Limited Kingdom, BS17 6AX.

BP3670

Constation 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. Softeware lets user customize cover sheets, store transmission log files and phone directories, schedule future transmissions, and automatically redial phone numbers. Complies with FCC Group 3 standards. $699. PSI Integration, 408/559-8544, 800/622-1722.

Executive Portable Office
System is packaged in shock-resistant, Haliburton case; system includes a 68030-based Outfitter 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, 44MB of RAM, and 3.5-inch SuperDrive. Standard system weighs less than 18 lbs. $7950; with scanner $8995. Computers Plus, 813/277-0063.

LabeEase
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 printer, 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 8AA-size rechargeable batteries for 12 hours of battery life. Uses Sharp LCD screen, available in backlight and nonbacklight versions. Company says will be priced at less than $2000. PI Systems, 503/239-9585.

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 modules. Developer will operate with address to take advantage of the MacWatt’s speed. 25MHz with 4MB of DRAM $6100; 40MHz with 16MB of DRAM $10,400. Division Limited, Quincy Rd., Chipping Sodbury, Bristol, United Kingdom, BS17 6AX.

MagicNet
Local area network hub that operates at 10Mbit 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 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 $599. Tutankhamon Electronics, 510/682-6510.

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 grayscale 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 $995. Computer Care, 612/371-0061, 800/950-2273.

OptiStore 650
Rewritable magneto-optical disk subsystem with storage capacity of 650MB per removable cartridges.

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 $995; with a 15-inch monochrome monitor $995. MicroMac Technology, 714/363-9315.

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 over-head 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.

Mac Warner
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 modules. Developer will operate with address to take advantage of the MacWatt’s speed. 25MHz with 4MB of DRAM $6100; 40MHz with 16MB of DRAM $10,400. Division Limited, Quincy Rd., Chipping Sodbury, Bristol, United Kingdom, BS17 6AX.
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PowerMemory Family of expandable RAM boards that can increase total memory to 4MB on Macintosh PowerBook series. 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 $199; 4MB flexible RAM $599. PowerMemory Integration. 408/559-8544, 800/622-1722.

QBlazer A portable 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 Micro­ Phone II for $99, $745. Telebit Corp., 408/734-4333, 800/835-3248.

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 Tower Tracking system to ensure data integrity. Drives under lifetime warranty. Extends 14,400 bps. Effectively stores and manipulates formats. Supports 240

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

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Telex RA2136 Fax machine that acts as a Macintosh peripheral 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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**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. 1.1MB min. memory, $79.95. Saliens National Business Software, 408/522-5500.

**DataClub Elite**
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**designPower**
Application for use with Claris CAD that 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 Chrichton, and Marián 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, WordStar, 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, order 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.

**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 Clipbook.

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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 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 profitability, and market analysis. 2MB min. memory. $125 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 words. Players can enter new words and definitions in user dictionary. Game allows four human players; computer 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 blanks 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. Ballyswe Software, 702/831-2523.

**Stufflt 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, 408/61-6200.

**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. 1 MB min. memory. $59. The HandOff Corp., 214/727-2329.

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**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
October 22, 1991

Dear 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.

Monogrammed yours,

[Signature]

---

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?

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Contains 17 photo-realistic surfaces for use with Pixar's Showplace and MacRenderMan. Volume 1 includes Tortoiseshell, Tweed Fabric, and Wood Veneer surfaces. Volumes 2 and 3 designed for architectural uses. Surfaces are applied to objects in Showplace or MacRenderMan and can be altered for varying effects. Volume 1 $495; Volumes 2 and 3 $345 each. The Vats Group, 510/236-4124.

VG Shaders + VG Looks

The Macintosh Bible Guide to FileMaker Pro

Book on the popular database program details.

FileMaker Pro's capabilities and limitations. Written by Charles Rubin, $18 plus s/h. Goldstein & Blair, 510/524-4000.

Macintosh Companion

Book for beginners Macintosh users that starts with basics of setting up computer and advances to coverage of System 7, MultiFinder, and PostScript. Written by Stephen Zardetsky and illustrated by Birke Breathed. $22.95. Addison-Wesley Publishing, 617/944-3700.

Upgrading and Repairing
Your Macintosh

Provides overview of the Mac and its hardware, operating system, and graphical user interface. Gives readers techniques for diagnosing and correcting problems and teaches how to determine whether problems are hardware- or software-related. Sections focus on connecting peripherals, networking a Mac, and using diagnostic tools included in Mac system. Written by Doug High. $29.95. M&T Books, 415/366-3600.
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.

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3. The Omitted Form
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5. The Overlooked Deduction
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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 disk, 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

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.

Dipul Dudgaonkar
Slidell, Louisiana

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 peruse 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

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

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 ($10/549-2684) 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

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

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.
connection 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.

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 3€-option (or field locations when pressing 3€-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 can'tPeek 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
SoftPC makes your Mac an IBM compatible. With SoftPC, the new Macintosh computers are more than just powerful and portable. They are also the most compatible computers available. Now they can run a whole world of MS-DOS software. Because SoftPC \* from Insignia Solutions lets you run any MS-DOS program on a Macintosh. Even over a Novell PC network.

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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 reopen the original document, you can reselect 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 distribute the weight evenly. Then center the assembly under your system.

Mark D. Vermette
Austin, Texas

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 install 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. Rams
Canyon, Ohio

Please Pass the Mac

Rubber feet:
Top plate
Bottom plate
Bearing (hidden)

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.

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.

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* SOURCE: International Data Corporation, August 1990.
Is Macworld Expo?

MACWORLD EXPO/BARCELONA
Growth in number of Macintosh computers purchased in Spain during 1990: 94%

MACWORLD EXPO/FRANCE
Growth in number of Macintosh computers purchased in France during 1990: 73%

MACWORLD EXPO/STOCKHOLM
Growth in number of Macintosh computers purchased in Sweden during 1990: 73%

MACWORLD EXPO/TOKYO
Growth in number of Macintosh computers purchased in Japan during 1990: 36%

MACWORLD EXPO/AUSTRALIA
Growth in number of Macintosh computers purchased in Australia during 1990: 22%

MACWORLD EXPO/BIRMINGHAM
Growth in number of Macintosh computers purchased in the U.K. during 1990: 53%

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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 IleX 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 IleX, 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 IleX 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 ComputerServe (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.

LCON 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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FolderBolt
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MacEKG
MicroMat 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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When I heard “balance sheet,” I broke into a sweat. I know type, advertising, printing. Now I was forced to do our books. No choice.

We were on our third part-time bookkeeper in eleven months, and she was called away suddenly. Sound familiar?

But I'm the boss and the buck stops with me. We had bills to pay, payroll checks to write, invoices to send, taxes to set aside. And deadbeats to collect from—only I had no idea who owed us how much or for how long. Some suppliers may have even thought of us as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve firepower for later on.

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.

What I didn't know was costing my company

I discovered a key client who hadn't paid in two months. I called and collected now he wants to know about atOnce! I wrote payroll checks for the staff, and sent our bank a balance sheet. I printed out myself—no sweat.

From fear and loathing to passion. Now I even study the management reports atOnce generates.

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Call now to order 1-800-247-3224
Alternative Mass Storage

BY JIM HEID

Soon 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 lighting-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' DataPak 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 sells 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 continue
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, 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 Transpor­tatable 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.)
If you think the only way to avoid running out of memory is to avoid running a couple of your favorite applications, think again.

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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.)

**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.

**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 Ricoch cartridge, however, is better protected against dust and contamination by several air filters and seals. A Ricoch cartridge’s locking door also makes it more difficult to accidentally finger the platter inside.

But Ricoch 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 startup. (Bernoulli and Ricoch 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

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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 3¼-inch cartridges that hold between 500MB and 6000MB, but a newer generation of drives uses 5½-inch cartridges that hold about 128MB. These drives are faster than their more-ample cousins. Drives storing 500MB to 6000MB 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 floppytes 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.
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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.

**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 ic14 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 ic14 icon or the ic18 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 ic14 icon and the large Mask icon. Finally, close all the windows or quit ResEdit and save your changes. To see the finished product, restart the Mac (3).

**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
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

System 7 Step-Savers

Choosing Finder Shortcuts from the Finder's Help menu reveals more than two dozen keyboard shortcuts that go beyond the 36-key shortcuts listed in the Finder's menus.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch to another open program and hide the current program's windows</td>
<td>Press option while clicking another program's window, choosing from the Application menu, or clicking the desktop</td>
</tr>
<tr>
<td>Expand the active window's entire outline (all folders)</td>
<td>Press X-A and then press 1-option-right arrow</td>
</tr>
<tr>
<td>Collapse the active window's entire outline (all folders)</td>
<td>Press X-A and then press 1-option-left arrow</td>
</tr>
<tr>
<td>Erase the floppy disk you're inserting</td>
<td>Press 1-option-tab at disk insert</td>
</tr>
<tr>
<td>Bypass the internal hard disk during start-up</td>
<td>Press 1-option-escape</td>
</tr>
</tbody>
</table>

Some Finder shortcuts also work in the directory dialog boxes you get when you use Open, Save, and other disk-related commands.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move from the name-entry box to the directory list and vice versa (in a Save dialog)</td>
<td>Press tab</td>
</tr>
<tr>
<td>Select an item to open</td>
<td>Type item's full or partial name</td>
</tr>
<tr>
<td>Open the selected item</td>
<td>Press X-down arrow</td>
</tr>
<tr>
<td>Open the enclosing folder or disk</td>
<td>Press X-up arrow or double-click</td>
</tr>
<tr>
<td>Go to the next disk or volume</td>
<td>Press X-left arrow</td>
</tr>
<tr>
<td>Go to the previous disk or volume</td>
<td>Press X-right arrow</td>
</tr>
<tr>
<td>Go to the desktop</td>
<td>Press X-D or X-shift-up arrow</td>
</tr>
<tr>
<td>Go to the original of the selected alias (instead of opening it)</td>
<td>Press option while clicking the Open button or while double-clicking the alias</td>
</tr>
<tr>
<td>Cancel the directory dialog box</td>
<td>Press escape or X-Period (.)</td>
</tr>
</tbody>
</table>
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**Page 228**
- Apple ad with IBM Headquarters—Apple/BBDO. Source: San Jose Mercury News
- Sculley and Kuehler—Scott Sommerdor/San 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—Anne Hurty
- Sculley with PowerBook—AP/Wide World
- Siskel & Ebert interview—Source: Playboy Magazine and @ Buena Vista Television
- Siskel & Ebert photo—Buena Vista Television
- Machandwriter—Communication Intelligence Corp.
- IBM-Tainted Apple cartoon—Source: Oakland Tribune
- Mac-Designed Sweater—Source: Oakland Tribune
- Dennis the Menace—Source: Hank Ketcham and @ North America Syndicate

**Page 230**
- Computer Millionaires—Source: Forbes Magazine
- Customer Support illustration: Ward Schumaker
- Kahn on motorcycle—Torin Boyd (for US News & World Report)
- Kahn sailing—Jean-Pierre Thomas
- Kahn with saxophone—Chuck Gathard

**Page 231**
- Sculley in Japan—AP/Wide World
- System 7 brochure—Source: Apple Computer
- Kahn on motorcycle—Torin Boyd (for US News & World Report)
- Kahn sailing—Jean-Pierre Thomas
- Kahn with saxophone—Chuck Gathard

**Page 232**
- Group of sinkers—Source: San Jose Mercury News
- Sony-Apple announcement—Source: Wall Street Journal
- Kahn on motorcycle—Torin Boyd (for US News & World Report)
- Kahn sailing—Jean-Pierre Thomas
- Kahn with saxophone—Chuck Gathard

**Page 233**
- Francis Ford Coppola—Source: KQED, San Francisco
- Thousand points of light—Source: Nitrile Films
- The power to crush other kids—Source: NBC
- The power to crush other kids—Source: NBC
- LC in Video Award—Source: NBC
- Pedagogy as demagogue—Source: BBDO

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**Page 233**
- Francis Ford Coppola—Source: KQED, San Francisco
- Thousand points of light—Source: Nitrile Films
- Star Tech—Source: Apple Computer
- Yuppie puppy dog care—Source: NBC
- The power to crush other kids—Source: NBC
- LC in Video Award—Source: NBC
- Pedagogy as demagogue—Source: BBDO
- Classical Mac—Source: WGBH, Boston
- Dad’s psycho—Source: Kindergarten Cop
- A Mac user—Source: Columbia Records Video
Macworld Magazine Rates SuperMac Number 1, 2, 3, 4, and 5!

The 1991 Macworld Lab test results on 24-bit color display systems are in. Out of the fifteen 19" color display systems tested SuperMac swept the top five places. And out of the six 21" color display systems, SuperMac captured the top two places. But SuperMac's boards and monitors were not just marginally faster—even our lowest-cost Spectrum/24 Series III outperformed its more expensive competitors.

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- 8/180 System .......... $5,999

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<tr>
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<th>Model</th>
<th>Features</th>
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<th>External Price</th>
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<td>1.2 Gig</td>
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### Hitachi Drives

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<td>1.6 Gig</td>
<td>5.25&quot;</td>
<td>5yr warranty, 12ms access</td>
<td>$2798</td>
<td>$2898</td>
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- **WangDat 2.1 Gig Capability** $1498
- **ArDat 2.1 Gig Capability** $1398
  - Up to 10 mb per minute backup time
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- **44MB Removable** $448.00
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<td>83</td>
<td>156-157</td>
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<td>145</td>
<td>363</td>
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<td>—</td>
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<td>Intuit</td>
<td>—</td>
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<td>58</td>
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<td>Microsft Direct</td>
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<td>COMPUTER SYSTEMS</td>
<td>—</td>
<td>366</td>
<td>MacAcademy</td>
<td>106</td>
<td>373</td>
<td>Cineon America, Inc.</td>
<td>94</td>
<td>339-339</td>
<td>Oceana Nova</td>
<td>165</td>
<td>63</td>
<td>Entourage</td>
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<tr>
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<td>UTILITIES</td>
<td>168</td>
<td>374</td>
<td>MIA</td>
<td>51</td>
<td>375</td>
<td>CoverDesign</td>
<td>87</td>
<td>368</td>
<td>PowerUp Software</td>
<td>87</td>
<td>376</td>
<td>Adobe Systems Stationary Prod. 108</td>
<td>194</td>
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<td>HARDWARE</td>
<td>167</td>
<td>377</td>
<td>MCI</td>
<td>67</td>
<td>378</td>
<td>QuickDraw</td>
<td>129</td>
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<td>Spooler</td>
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<td>81</td>
<td>383</td>
<td>Dismo</td>
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<td>SERVICES</td>
<td></td>
<td>384</td>
<td>Macintosh Service Directory</td>
<td>223</td>
<td>385</td>
<td>Printer Connection</td>
<td>16</td>
<td>386</td>
<td>Advanced Business Center</td>
<td>227</td>
<td>387</td>
<td>MacWorld</td>
<td>15</td>
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</table>

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4227

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4737

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REMOVABLE HARD DISK

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TAPE BACKUP

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<tr>
<td>4MB (45-80ns)</td>
<td>$159</td>
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<tr>
<td>Mac LC 2/40</td>
<td>1799.00</td>
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<tr>
<td>Mac IIci 5/120</td>
<td>CALL</td>
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<td>Quadra 700 4mb</td>
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<td>Quadra 900 4mb</td>
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<td>PowerBook 104 140</td>
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**Call for other configurations.**

### HARDWARE

#### DISK DRIVES & CD ROMS

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#### DISPLAY SYSTEMS

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<td>4850.00</td>
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<td>Pinnacle 15 Series</td>
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<td>Publisher 18 Series</td>
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#### PRINTERS & SCANNERS

<table>
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<tbody>
<tr>
<td>CASE</td>
<td>453.00</td>
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<tr>
<td>MICROTEK</td>
<td>1430.00</td>
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<tr>
<td>SCANNERS 6000S</td>
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<tr>
<td>MACROMAX</td>
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<tr>
<td>NB250</td>
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<tr>
<td>RGB250</td>
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<td>RGB350</td>
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<td>Gear</td>
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<tr>
<td>GS-410</td>
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<tr>
<td>GS-1155</td>
<td>4979.00</td>
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<td>ESSEKSA</td>
<td>CALL</td>
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<tr>
<td>SP340DAP DOT MATRIX</td>
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<tr>
<td>EMACHINES</td>
<td>1799.00</td>
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<tr>
<td>COLORPAGE 116</td>
<td>5025.00</td>
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<tr>
<td>TURBO EX</td>
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<td>TURBO SX</td>
<td>1999.00</td>
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<tr>
<td>GENERATION SYSTEM TV BOARD</td>
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<td>NPC</td>
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<td>BASTERVED</td>
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#### SOFTWARE

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<tr>
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<tr>
<td>DESKTOP</td>
<td>CALL</td>
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<tr>
<td>DOVE</td>
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<td>DOVEFAX</td>
<td>2756.00</td>
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<td>HAYES</td>
<td>CALL</td>
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<td>PROMOTHEUS</td>
<td>CALL</td>
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<td>PROMODEN</td>
<td>669.00</td>
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<tr>
<td>PROMODEN 249A MINIFAX PLUS</td>
<td>285.00</td>
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<td>SUPER FAX/MODEN</td>
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<tr>
<td>ZOOM</td>
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</tr>
<tr>
<td>PRO25A FAX/MODEN</td>
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**Call for other configurations.**

#### BUSINESS

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<td>CLARIS - 30 Day MBG</td>
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<tr>
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<td>MACWRITE II</td>
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<td>INSIGNIA - 30 Day MBG</td>
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<tr>
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<td>SYSTEM 3</td>
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<td>QUICKEN</td>
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<tr>
<td>MICROSOFT - 30 Day MBG</td>
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<td>MICROSAFETY-Canada</td>
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<td>COLORFAX - 30 Day MBG</td>
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<td>EXCEL 3.0</td>
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<td>MORE</td>
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<tr>
<td>WORDPERFECT - 30 Day MBG</td>
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<tr>
<td>DTP &amp; GRAPHICS</td>
<td>CALL</td>
</tr>
<tr>
<td>ADORE - 30 Day MBG</td>
<td>CALL</td>
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<tr>
<td>FONT LIBRARY</td>
<td>CALL</td>
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<tr>
<td>ILLUSTRATOR W/ ATM</td>
<td>CALL</td>
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<tr>
<td>PHOTO SHOP</td>
<td>CALL</td>
</tr>
<tr>
<td>ALDUS - 30 Day MBG</td>
<td>CALL</td>
</tr>
<tr>
<td>DIGITAL DUBROOM</td>
<td>CALL</td>
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<td>FREETREE - 30 Day MBG</td>
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<td>SUPER CARD</td>
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<td>SUPER PAINT</td>
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<td>SHOWPLACE</td>
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<td>CANVAS</td>
<td>CALL</td>
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<td>ELECTRONIC ARTS - 30 Day MBG</td>
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<tr>
<td>STUDIO 3</td>
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<td>GRAPHIC-30 Day MBG</td>
<td>CALL</td>
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<tr>
<td>LERAST - 30 Day MBG</td>
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<tr>
<td>MACROMIND - 30 Day MBG</td>
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<tr>
<td>MACROMIND DIRECTOR</td>
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<td>MACROMIND</td>
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<td>MEDIAMAKER</td>
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<tr>
<td>FILM MAKER</td>
<td>CALL</td>
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<tr>
<td>SWIVEL 3D</td>
<td>CALL</td>
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</table>

### Hewlett-Packard

- **Deskwriter with cable** $399.00
- **Deskwriter C** $725.00
- **PAINTWRITER** $659.00
- **PAINTPERFECT + XL** $1,649.00
- **SCANJET 4C** $1,349.00

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- **PSI Power Modem** $219.00

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- **MACSAFE** $65.00
- **QUICK LOCK** $35.00
- **LEFTEE - 30 Day MBG** $70.00
- **CORRECT GRAMMAR** $50.00
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- **Norton Utilities** $60.00
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CARRE

TYPIST PLUS ... 469
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DEXT

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MACSCANNER 3000 ... 990
KODAK

DIAGNOSTIC PRINTER ... 369
LOGITECH

SCANNERS ... 269
MARSH

MARS 860 MAC 64 HAND SCANNER ... 993
COLOR ARTIST HAND SCANNER ... 579
MICROTEK

SCANNER 1600 3SCANNER ... 2299
SCANNER 9000 GREYSCALE ... 1179
SCANNER 8002 COLOR SCANNER ... 1495
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NEC

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SILENT WINTER 2 MODEL 90 ... 1495
PRINTER

PHOTOTAC 880 655 SCANNER, PHOTOSHOP ... 209
WORDSCAN & SHARP FOOD ... 785

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NASUX

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UXA COLOR 900 ... 1379

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CARRIERS

OAPAGE 3.0 ... 499

CLARIS

CLARS CAD 2D ... 625
FILEMANAGER 200 ... 299
FILEMANAGER ANALYTICAL ... 299

CERES SOFTWARE

NAVIGATION 0.0 ... 169
CHIPS.

MAGNITI ... 56

DESIGNED AT CUSV 20.7 ... 398

TARGETS

DELTA GRAPH 1.5 ... 117

DESIGNCAD

DESIGNCAD 3010 ... 308

MONITORS & BOARDS

APPLIED ENGINEERING

CACHE IN ...

FASTMATII 1C ... 129
QUICKSTEP ...

HARRIS LABORATORYS

PERFORMER ACCELERATOR CLASSIC ... 2395
E MACHINES

QUICKSTEP STUDIO ... 1839
QUICKSTEP 1000 COLOR SCANNER ...
T16 COLOR PAGE SYSTEM ... 1890
T16 20 COLOR SCANNER ... 3098
TX 16 COLOR SCANNER ... 2545
MAC S CLASSIC 200 MONO SYSTEM ...
MAC S CLASSIC 200 MONO SYSTEM ...
MAC S CLASSIC 200 MONO SYSTEM ...
COLOR SPACE ...

DATAPAK ...

FRAMEPLUS REMOVABLE HD ... 358
RIVAL 19" MONO SYSTEM, MAC II ... 1875

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Specially designed to simplify communications for the first-time home or business user. Personal Modem Plus products offer a complete PC or Macintosh" communications solution since they are bundled with Smartcom" communications software and come with permanently attached computer and telephone cables.

MICRONT

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SCANNER 300 COLOR ... 999
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SCANNER 8002 COLOR SCANNER ... 1495
TRUE LASER/TRUE IMAGEMAKER LASER 1295
NEC

COLORFAX FS MODEL 40 ... 599
SILENT WINTER 2 MODEL 90... 1495
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PHOTOTAC 880 655 SCANNER, PHOTOSHOP ... 209
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T16 COLOR PAGE SYSTEM ... 1890
T16 20 COLOR SCANNER ... 3098
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MAC S CLASSIC 200 MONO SYSTEM ...
MAC S CLASSIC 200 MONO SYSTEM ...
COLOR SPACE ...

DATAPAK ...

FRAMEPLUS REMOVABLE HD ... 358
RIVAL 19" MONO SYSTEM, MAC II ... 1875

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Drive Prices guaranteed to be at or below listed prices. Call for latest.
SyQuest, Optical, and DAT available Internally for Quadra 600!

DAT DRIVES

<table>
<thead>
<tr>
<th>Size</th>
<th>Internal</th>
<th>External</th>
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<td>650 MB</td>
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Portable CD-ROM (Toshiba)
Includes front ext.

REMOTE MEDIA

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<td>OptiDisk 1000</td>
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<tr>
<td>OptiDisk 128</td>
<td>475.00</td>
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<tr>
<td>45 SR (SyQuest) w/cartridge</td>
<td>475.00</td>
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<tr>
<td>45 DR (Dual SyQuest) w/2 cassettes</td>
<td>699.00</td>
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<tr>
<td>88 SR (SyQuest) w/cartridge</td>
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<tr>
<td>88/45 DR (Dual SyQuest) w/2 cassettes</td>
<td>1199.00</td>
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<tr>
<td>1501 Teac Tape Streamer</td>
<td>595.00</td>
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<tr>
<td>DATdrive 299</td>
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</tr>
<tr>
<td>DATdrive 599</td>
<td>1595.00</td>
</tr>
</tbody>
</table>

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Third wave memory for every Mac.
Built in our own facility.

1, 2, 4, 8, and 10 MB SIMMs
Logics SIMM Pack for Classic 0, 1, or 3 MB
LC and Quadra V4 RAM SIMMs
PowerBook 2, 4, or 8 MB
Prices change often. call for latest.

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 MB Tape for Teac</td>
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</tr>
<tr>
<td>150 MB Tape for Teac</td>
<td>24.00</td>
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<tr>
<td>SyQuest 45 MB cartridge</td>
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<td>SyQuest 85 MB cartridge</td>
<td>125.00</td>
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<td>DAT cassette 50 meter</td>
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<td>DAT Cassette 90 meter</td>
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<tr>
<td>Optical cartridge (ISO) 512 kb/sector</td>
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<td>Optical cartridge 128 MB</td>
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<tr>
<td>Xsanip vide diskette</td>
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</tr>
<tr>
<td>Maxima 2.0 memory mgmt. software</td>
<td>45.00</td>
</tr>
</tbody>
</table>

DISPLAY SYSTEMS

SuperMac, RasterOps,
Radius, Ikegami, Seiko and Sony.
13, 16, 19, and 21 inch monitors
Accelerated Video cards.
Call for latest prices!
America’s Largest Macintosh Hardware Source

Quantum

Hard Disk Drives

**SyQuest**

**Removable Hard Disk Drives**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
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<td>44mb Removable Drive</td>
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<tr>
<td>88mb Removable Drive</td>
<td>$599*</td>
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*Cartridge Not Included

**CARTRIDGES**

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<td>Single Cartridge</td>
<td>$66</td>
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<tr>
<td>5 Pak - Each</td>
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<td>10 Pak - Each</td>
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**INTERNAL**

<table>
<thead>
<tr>
<th>Model</th>
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<td>$639</td>
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**EXTERNAL**

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<tr>
<td>52MB</td>
<td>$289</td>
</tr>
<tr>
<td>105MB</td>
<td>$389</td>
</tr>
<tr>
<td>210MB</td>
<td>$689</td>
</tr>
<tr>
<td>425MB</td>
<td>$1299</td>
</tr>
</tbody>
</table>

**Combination Units**

SyQuest 44/SyQuest 44 ................ $799
SyQuest 44/Quantum 52 ................ $699
SyQuest 44/Quantum 105 ............... $799
SyQuest 44/Quantum 210 .............. $1,099
SyQuest 44/Quantum 425 .............. $1,499
SyQuest 88/SyQuest 88 ............... $1,199
SyQuest 88/Quantum 52 ............... $899
SyQuest 88/Quantum 105 .............. $999
SyQuest 88/Quantum 210 .............. $1,299
SyQuest 88/Quantum 425 .............. $1,699

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MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217
<table>
<thead>
<tr>
<th>Printer Model</th>
<th>Features</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microtek TrueLaser</td>
<td>300 dpi, 6 ppm, PostScript® Clone, 35 Resident TrueType Fonts, RISC Processor</td>
<td>$1,349</td>
</tr>
<tr>
<td>QMS PS410</td>
<td>300 dpi, 35 PostScript® Fonts, Auto-Switching: Mac/PC, 4 ppm Print Speed</td>
<td>$1,699</td>
</tr>
<tr>
<td>QMS 815MR</td>
<td>300 or 600 dpi, PostScript® Compatible, Auto-Switching: Mac/PC, 6 ppm Print Speed</td>
<td>$4,250</td>
</tr>
<tr>
<td>NEC Silentwriter 2 MODEL 90</td>
<td>300 dpi, 35 PostScript® Fonts, 6 ppm Print Speed, 2mb RAM</td>
<td>$1,599</td>
</tr>
<tr>
<td>RasterOps CorrectPrint 300</td>
<td>300 dpi, Dye-Sublimation, Photorealistic Color Printer, Introductory Price</td>
<td>$7,499</td>
</tr>
<tr>
<td>QUME MacPublisher</td>
<td>RISC Processor, 2MB RAM, PostScript® Compatible, 300 dpi</td>
<td>$1,599</td>
</tr>
<tr>
<td>QUME CrystalPrint Pub II</td>
<td>RISC Processor, 6ppm, PostScript® Compatible, 3MB RAM, 300dpi</td>
<td>$1,995</td>
</tr>
<tr>
<td>QUME CrystalPrint Express</td>
<td>RISC Processor, 12ppm, 300dpi, PostScript® Compatible, 3MB RAM</td>
<td>$2,995</td>
</tr>
</tbody>
</table>

To Order Call 1-800-888-8779  Customer Service Call 1-800-388-3118
MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217
<table>
<thead>
<tr>
<th>Monitor Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacScan ULTRA</td>
<td>$369</td>
</tr>
<tr>
<td>GOLDSTAR 1450 Plus</td>
<td>$349</td>
</tr>
<tr>
<td>SEIKO CM1445</td>
<td>$58</td>
</tr>
<tr>
<td>E-MACHINES T-16 Trinitron</td>
<td>$1,995</td>
</tr>
<tr>
<td>Lapis Technologies, Inc.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitor Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ColorServer LC-17</td>
<td>$379</td>
</tr>
<tr>
<td>ColorServer LC-21</td>
<td>$509</td>
</tr>
<tr>
<td>ColorServer PDS/30-17</td>
<td>$379</td>
</tr>
<tr>
<td>ColorServer II-17</td>
<td>$379</td>
</tr>
<tr>
<td>ColorServer PDS/30-21</td>
<td>$509</td>
</tr>
<tr>
<td>ColorServer II-21</td>
<td>$509</td>
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<tr>
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<table>
<thead>
<tr>
<th>Monitor Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Microtek 600zs Color Scanner</td>
<td>$1399</td>
</tr>
<tr>
<td>Microtek ScanMaker1850s</td>
<td>$2,199</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitor Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>MAGNAVOX 14&quot; Color Monitor/ 24 BIT Video Card (II)</td>
<td>$929</td>
</tr>
<tr>
<td>MAGNAVOX 14&quot; Color Monitor/ 24 BIT Video Card (SE30)</td>
<td>$1,069</td>
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<tr>
<td>MAGNAVOX 20&quot; Color Monitor/ 8 BIT Video Card (II)</td>
<td>$1,999</td>
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<tr>
<td>MAGNAVOX 20&quot; Color Monitor/ 8 BIT Video Card (SE30)</td>
<td>$1,999</td>
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</table>

<table>
<thead>
<tr>
<th>Monitor Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>MAGNAVOX 9CM080</td>
<td>$469</td>
</tr>
<tr>
<td>MAGNAVOX MagnaScan/20</td>
<td>$1,499</td>
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<tr>
<td>MAGNAVOX 20&quot; Color Monitor</td>
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<table>
<thead>
<tr>
<th>Monitor Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Microtek ScanMaker1850s</td>
<td>$2,199</td>
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</tbody>
</table>

To Order Call 1-800-888-8779 Customer Service Call 1-800-388-3118
MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217
### Ethernet Cards for Macintosh®

<table>
<thead>
<tr>
<th>Card Type</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>IACCON+1IE64 (Mac II Thick/Thin w/64k)</td>
<td>$299</td>
</tr>
<tr>
<td>IACCON+1IET 64 (Mac II Thick/10BaseT w/64k)</td>
<td>$299</td>
</tr>
<tr>
<td>IACCON+LC w/ FPU (MacLC Direct Slot: Thin/10BaseT)</td>
<td>$379</td>
</tr>
<tr>
<td>IACCON+30IET (Mac SE30 Thick/10BaseT)</td>
<td>$299</td>
</tr>
<tr>
<td>IACCON+30IET64 (Mac SE30/ST 10BaseT w/64k)</td>
<td>$299</td>
</tr>
</tbody>
</table>

### Ethernet Adapter Cards...Lifetime Warranty!

<table>
<thead>
<tr>
<th>Adapter Type</th>
<th>Price</th>
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<tbody>
<tr>
<td>Iibus Thin/10T/AAUI</td>
<td>$219</td>
</tr>
<tr>
<td>E30 10T/Thin</td>
<td>$219</td>
</tr>
<tr>
<td>si 10T/Thin (includes: FDS/30 Adapter w/ FPU Socket)</td>
<td>$279</td>
</tr>
<tr>
<td>C 10T/Thin</td>
<td>$219</td>
</tr>
</tbody>
</table>

### Other Great Deals!

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
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<tbody>
<tr>
<td>Kensington Turbo Mouse ADB</td>
<td>$109</td>
</tr>
<tr>
<td>MacPro Keyboard</td>
<td>$139</td>
</tr>
<tr>
<td>Daystar FastCache 11c</td>
<td>$269</td>
</tr>
<tr>
<td>ZoomExt. 24/96 S/R Fax Modem</td>
<td>$149</td>
</tr>
<tr>
<td>Abaton Interfax 24/96 Modern</td>
<td>$299</td>
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</tbody>
</table>

### Memory

<table>
<thead>
<tr>
<th>Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1mb 100ns Simms</td>
<td>$32</td>
</tr>
<tr>
<td>1mb 80ns Simms</td>
<td>$39</td>
</tr>
<tr>
<td>4mb FX Simms</td>
<td>$159</td>
</tr>
<tr>
<td>1mb 60ns Simms</td>
<td>$59</td>
</tr>
<tr>
<td>4mb 80ns Simms</td>
<td>$240</td>
</tr>
</tbody>
</table>

### Other Deals

- **Payment Methods Accepted:**
  - MasterCard
  - VISA
  - DISCOVER
  - MacLand

- C.O.D.’s payable with Cashier’s Check or Money Order.

- **Attention:**
  - Businesses, Government, Educational Inst., Military
  - Fax your P.O. for same day shipment,
  - P.O.’s accepted on approved accounts,
  - All shipments are FOB origin,
  - Prices do not include freight,
  - Favorable terms offered to established accounts,
  - LEASING option available,
  - Call for details and pricing!

- **To Order Call 1-800-888-8779** Customer Service Call 1-800-388-3118
  - MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
  - 24 Hr. Fax: (602) 345-2217
  - Circle on reader service card
**microLaser Turbo**

This printer is so fast it gets speeding tickets!

- 9 pages per minute

**microLaser Turbo XL**

- 16 pages per minute

**AppleTalk Included**

**NEW!**

**microLaser Plus**

The microLaser is now the microLaser Plus, with a 9 page per minute engine!

**microLaser XL**

- Automatic emulation switching
- Free Paper Tray Management
- Optional envelope feeder
- Optional 300 sheet second paper drawer
- Hewlett-Packard LaserJet Series II emulation
- 6 Times Faster Than Other Postscript Printers

**Postscript Printers**

<table>
<thead>
<tr>
<th>LabelWriter II/II Plus</th>
<th>AddressWriter Envelope Printer</th>
<th>GCC</th>
<th>PLPI, PLPIIS, BLP Elites, WriteImpact, WriteMove</th>
<th>Silentwriter2 Model 90</th>
<th>Silentwriter2 Model 990</th>
<th>OMS/PS 410</th>
<th>PS 815MR, PS 825MR</th>
</tr>
</thead>
<tbody>
<tr>
<td>$189/$299</td>
<td>$479</td>
<td></td>
<td>$1549</td>
<td>$2895</td>
<td>$1645</td>
<td>$1549</td>
<td>$899 +$195/395</td>
</tr>
</tbody>
</table>

**Scanners**

- $465
- $489 (special)
- $465
- $1399

**Data Modems**

- 2400 bps
- 3300 bps
- 9600/14,400 bps

**Fax Modems**

- Abaton InterFax 24/96
- DoveFax
- DoveFax Plus
- DoveFax Lan
- Global Village

**Prices**

- $249
- $325
- $599
- $689
- $599
- $325
- $179

**New Low Price!**

**DoveFax**

$249

---

**Syquest**

$68

---

**SIMMS**

$115

---

**Upgrade your microLaser or microLaser XL to a Turbo Call!**

---

**Other Commodities**

- **Accessories & Supplies**
- **AppleTalk Included**
- **3 Interface Ports: AppleTalk, RS-422, RS-232-C**
- **Automatic switching between ports - all ports are hot**

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**NYC**

- **AppleTalk Included**
- **We stock all MicroLaser Accessories & Supplies**
- **110 & 220 Volt MicroLaser Available**

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**ViVâ**

- **Vita**
- **Vita**
- **Vita**
- **Vita**
- **Vita**

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**ViVâ**

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- **FAX 512-476-3726**
- **International Orders 512-476-7466**

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**Prices valid 1/1/92 - 1/28/92**
CLASSIC ACCELERATION!

Tired of the big Macs locking send in your face? Get a Classic Accelerator! with the unparalleled speed, power and productivity of the 68030 for the Mac Classic! It has it all: 16 MHz 68030 CPU, 20 Megabytes of RAM, using a meg SIMMs, optional 68882 co-

processor, System 7.1 compatibility, bootable RAM Disk, optional video adaptors permitting use of up to two page monitors, and optional Virtual 3.0 from Connectix. And now with new low pricing, it's a better deal than ever before!

Classic Accelerator! Faster than the Classic II! $699

Your SE, Plus, 512K growing mass on it's north side? Get the accelerators MacWorld called the "Best Value" in compact Mac Acceleration! Unparalleled speed, power and productivity of the 68030 CPU, 20 Megabytes of RAM, using a meg SIMMs, optional 68882 co-

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NEWLife™

Tired of the big Macs locking send in your face? Get a Classic Accelerator! with the unparalleled speed, power and productivity of the 68030 for the Mac Classic! It has it all: 16 MHz 68030 CPU, 20 Megabytes of RAM, using a meg SIMMs, optional 68882 co-

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Classic Accelerator! Faster than the Classic II! $699

Eagle
Eagle
Sollco
Yiriuol 3.0 from Connoctix.
MHz
Tirod of the big Moes kicking sand inr, our
iJso of up to two pogo monitors, and optional
the 68030 CPU, 20 Megabytes of RAM, using a meg SIMMs, optional 68882 co-

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EAGLE™
The Only Removable Drives With A Five Year Warranty!

Eagle SyQuest

Eagle 88

PLI Infnitly 40 Turbo Call
Infnitly 88 Turbo $89

Iomega Bernoulli 90mb Cartridges for $169

E-Machines T16 Call!

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w/ 8 bit card $2565

w/ 24 bit card $2895

w/ 24 bit accelerated $2975

NEC FG Monitors

RosterOps Systems Call

Selko CM-1465 14” w/ RosterOps 24S $599

w/ RosterOps 264 for SE/30 $1175

HARD DRIVES

Five-Year Warranty!

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765 mb 6.6 ms $1399 $1499

1.2 GIG 4.1 ms $1999 $2099

1.5 GIG 4.1 ms $2599 $2699

1.6 GIG 11.5 ms $2899 $2999

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Year Warranty. Include bracket, metal rails, universal power

supplies, cables, formatting software and 15 MB of shareware.

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APPLE’s 16” Monitor of Choice FOR THE QUADRA 700 AND 900!

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We will meet or beat any of our mail order competitor’s advertised prices for identical items.

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SUPERMAC

19” Platinum Monitor (Gray Scale/Manual) $999 $999

Spectrum/B & D POD Monochrome Card $349 $349

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VideoSpigot Pro Ili, & NuBus Call!

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50 MHz available for Mac II, Ile, Ile,

11x, Ili, LC, & SE/30!

PowerCache 33 MHz

PowerCache 40 MHz

PowerCache 50 MHz

SCSI PowerCard

Call!

Call!

Call!

FastCache Card For Both the Ile & Ile

FastCache ile & Ile

$269 & $299

RAM

PowerCard

DayStar's RAM PowerCard

will make your disk

intensive tasks scream!

Place up to 16 standard 1 Meg, 4 Meg or 16 Meg SIMMs on this NuBus card for up to 256 Megs of memory.

RAM PowerCard

$499

30 DAY MONEY BACK GUARANTEE

Optical Cartridges

$125

Stik & 1024K

$125

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International Orders 512-476-7466

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This cut is too small for us to list all the Macintosh hardware we carry, so if you don't see it listed, call us.
128MB of storage for only $79. The NEW $1499 Magic 128REM Optical!

128MB of storage on a removable 3.5" disk! No bigger than a floppy! MacProducts does it again with a price of only $1499

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Qwork XPress
NEW! Version 3.1
$539
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Quark XPress
NEW? Version 3.1
$539
```

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System 7 $90
```

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SYSTEM SIMM 60-120 ns...from $29 .... $1
2MB SIMMs from $29 .... $2
4 & 16MB SIMMs...$149/$799 .... $6
MAC LC 8-bit Video RAM .... $79 .... $3
Portable RAM 1-8 MB...Call .... $2
Classic Upgrade 2/4MB....$49/$99 .... $2
GCC PL/PB 1MB....$69 .... $2
HP 1/2/4MB......$99/$179/$239 .... $3
L2R 960 2/4/8MB Upgrade...Call .... $2
QMS 2/4MB......$199/$339 .... $6
TI 1MB RAM Upgrade......$75 .... $3
```

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1 MB SIMMs from $29
Lifetime Guarantee
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Magic 45R $449
Magic 88R $599
SyQuest Mechanisms
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MacProducts USA Carries Over 9,000 Products for your Macintosh

Affordable leasing available for the entire MacProducts USA inventory. Leasing prices are denoted in the gray shaded area.

**Magic Modems & Fax Modems**

<table>
<thead>
<tr>
<th>Modem</th>
<th>Buy/Lease</th>
</tr>
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<tbody>
<tr>
<td>Magic 2400 1/2/300 baud</td>
<td>$69</td>
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<tr>
<td>Magic 2400/9600 SendFax Modem</td>
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<td>Magic 2400/9600 Fax Modem</td>
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<tr>
<td>Magic 2400 V.42 2400 baud</td>
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<td>Magic 2400 V.32/V.42 38.4k baud</td>
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**Macintosh Systems**

<table>
<thead>
<tr>
<th>System</th>
<th>Buy/Lease</th>
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<tbody>
<tr>
<td>The NEW MACS! Call for pricing!</td>
<td></td>
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<tr>
<td>Macintosh PowerBook 100</td>
<td>$399</td>
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<tr>
<td>Macintosh PowerBook 140</td>
<td>$699</td>
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<tr>
<td>Macintosh PowerBook 170</td>
<td>$999</td>
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<tr>
<td>Macintosh Classic 4/4/4</td>
<td>$1237</td>
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<tr>
<td>Macintosh Classic II</td>
<td>$1625</td>
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<tr>
<td>Classic II or LC 68882</td>
<td>$999</td>
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<tr>
<td>Macintosh LC</td>
<td>$1625</td>
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<tr>
<td>Macintosh Ilsi</td>
<td>$2299</td>
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<td>Mac Ilsi 2 Slot Adapter</td>
<td>$49</td>
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<td>Macintosh Ilsi</td>
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<td>Macintosh Quadra 700</td>
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<td>Macintosh Quadra 900</td>
<td>$999</td>
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<tr>
<td>Quadra VRAM</td>
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<td>Extended Keyboard</td>
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**Networking Solutions**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Buy/Lease</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacProducts carries networking solutions from Apple, ASANTE, CAYMAN, SHIVA, FARALLON, SITKA, MORE</td>
<td></td>
</tr>
<tr>
<td>MagicNet (localtalk)</td>
<td>$19</td>
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<tr>
<td>Magic EtherNet</td>
<td>$199</td>
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<tr>
<td>Farallon PhoneNet</td>
<td>$30</td>
</tr>
</tbody>
</table>

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"For a good deal on 19-inch Regals, check out the MacProducts Magic-View" - MacWorld Oct '91

MacProducts USA carries a complete line of Video from RasterOps, Radius, E-Machines, SuperMac, NEC, and More!

**Magic Video Solutions**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Buy/Lease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magic 19 or 20&quot; 24-bit card</td>
<td>$1299</td>
</tr>
<tr>
<td>Magic 13&quot; 8-bit color card</td>
<td>$269</td>
</tr>
<tr>
<td>Magic 20&quot; Trinitron</td>
<td>$2099</td>
</tr>
<tr>
<td>Magic 19&quot; 20&quot; 8-bit card</td>
<td>$499</td>
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<table>
<thead>
<tr>
<th>Printer</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Apple StyleWriter</td>
<td>$439</td>
</tr>
<tr>
<td>HP DeskWriter</td>
<td>$449</td>
</tr>
<tr>
<td>QMS PS 410</td>
<td>$1799</td>
</tr>
<tr>
<td>Microtek TrueLaser</td>
<td>$1399</td>
</tr>
<tr>
<td>GCC Laser Printers</td>
<td>$1699</td>
</tr>
<tr>
<td>Jeth Inc DeskWriter/SyleWriter Refill</td>
<td>$11</td>
</tr>
<tr>
<td>SeikoSka SP2000D DotMatrix</td>
<td>$209</td>
</tr>
<tr>
<td>We carry NEC, Abaton, Microtek, &amp; More!</td>
<td></td>
</tr>
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**Magic Accelerators**

<table>
<thead>
<tr>
<th>Accelerator</th>
<th>Buy/Lease</th>
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</thead>
<tbody>
<tr>
<td>Magic RailGun 030</td>
<td>$399</td>
</tr>
<tr>
<td>Magic RailGun 030 16 MHz</td>
<td>$399</td>
</tr>
<tr>
<td>Magic RailGun 030 25 MHz</td>
<td>$599</td>
</tr>
<tr>
<td>Magic RailGun 030 33 MHz</td>
<td>$899</td>
</tr>
<tr>
<td>Magic RailGun SCSI Accelerator</td>
<td>$499</td>
</tr>
<tr>
<td>MagicMath LC Coprocessor</td>
<td>$399</td>
</tr>
<tr>
<td>Accelerators/CACHE CARDS</td>
<td>$1699</td>
</tr>
<tr>
<td>DayStar PowerCache Ilsi 40MHz</td>
<td>$1119</td>
</tr>
<tr>
<td>Radius Rocket 040</td>
<td>$1899</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Hours</th>
<th>Office</th>
<th>Tech Support</th>
<th>Fax Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-F 8am-5pm</td>
<td>613</td>
<td>628</td>
<td>512 472-8881, 613</td>
</tr>
<tr>
<td>24 hr Fax Numbers</td>
<td>512 472-8881, 628</td>
<td></td>
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</tbody>
</table>

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Apple Macintosh IIGS 5/0 $1999
Apple Macintosh IIGS 5/40 $2175
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Apple Macintosh Quadra 950 $3575
Apple Macintosh PowerBook 100 2/30, $2029
Apple Macintosh PowerBook 140 4/40 $2841
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AE QuickSilver IIGS Cache Card $195
AE QuickSilver IIGS Cache Card with 68852 $225
AE TransWarp LC 35MHz Accelerator $699
AE TransWarp LC 35MHz Accelerator w/68802 $799

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E-Machines ColorPage T-16 $1600
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Syquest 68MB Cartridge 119
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PLU Infinity 88 Removable 549
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PLU Super floppy 399
PLU Turbo floppy 273
PLU Quick SSD with Cable 310
Quantum 52MB UPS 239
Quantum 155MB UPS 349
Quantum ProDrive 170MB 629
Quantum ProDrive 260MB 659
Quantum 252MB 1275
Syquest 4MB Cartridge 53
Syquest 8MB Cartridge 119

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NEC CGR-36 453
NEC CGR-36 w/ Type Gallery 468
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SOFTWARE

3 in 1 Driver 24
4th Dimension 2.2 468
Adobe Illustrator 3.2 w/ATM 335
Adobe Photoshop 2.0 615
Adobe StreamLine 2.0 75

Adobe Type Manager 2.0 210
Adobe Type Reunion 130
After Dark 2.0 98
Aldus Design Team 105
Aldus Freehand 3.0 30
Aldus PageMaker 4.01 48
Aldus PageMaker 4.03 106
Aldus Persuasion 2.0 65
Aldus Vista 65
Aldus Vista 2000 105
AppleWorks 4.2 25
AppleWorks 3.1 50
AppleWorks 2.0 10
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Adobe StreamLine 2.0 75

Adobe Type Manager 2.0 210
Adobe Type Reunion 130
After Dark 2.0 98
Aldus Design Team 105
Aldus Freehand 3.0 30
Aldus PageMaker 4.01 48
Aldus PageMaker 4.03 106
Aldus Persuasion 2.0 65
Aldus Vista 65
Aldus Vista 2000 105
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AppleWorks 3.1 50
AppleWorks 2.0 10
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AppleWorks 1.0 100

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<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classic 2/40</td>
<td>$1100</td>
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<tr>
<td>Classic II 2/40</td>
<td>$2199</td>
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<tr>
<td>PowerBooks</td>
<td>$1999</td>
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<tr>
<td>Quadra 700</td>
<td>$1699</td>
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<td>Quadra 900</td>
<td>$2299</td>
</tr>
<tr>
<td>PowerMac</td>
<td>$1499</td>
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</tbody>
</table>

### Clearances

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
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<tbody>
<tr>
<td>Apple LaserWriter Plus No姐</td>
<td>$1499</td>
</tr>
<tr>
<td>Minolta 9300 U5 Color</td>
<td>$399</td>
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<tr>
<td>LaserWriter Plus</td>
<td>$399</td>
</tr>
<tr>
<td>QMS Pluse</td>
<td>$399</td>
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<td>LaserWriter Elite</td>
<td>$399</td>
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<tr>
<td>Apple StyleWriter</td>
<td>$549</td>
</tr>
<tr>
<td>Ext. 101 Keyboard</td>
<td>$122</td>
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<tr>
<td>Gemini PS 410</td>
<td>$1299</td>
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<td>Radius Color Pivot</td>
<td>$1299</td>
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<tr>
<td>Radius Mono Pivot</td>
<td>$699</td>
</tr>
<tr>
<td>Precision 24Bit Card</td>
<td>$2199</td>
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<tr>
<td>SONY 1304 (NE.25 DA)</td>
<td>$569</td>
</tr>
<tr>
<td>QMS PS 410</td>
<td>$1699</td>
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### New Computers

<table>
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<tr>
<th>Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>PowerBooks</td>
<td>$1999</td>
</tr>
<tr>
<td>PowerMac</td>
<td>$1499</td>
</tr>
<tr>
<td>Quadra 700</td>
<td>$1699</td>
</tr>
<tr>
<td>Quadra 900</td>
<td>$2299</td>
</tr>
<tr>
<td>PowerMac</td>
<td>$1499</td>
</tr>
</tbody>
</table>

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- **Minolta 9300 U5 Color**
- **LaserWriter Plus**
- **QMS Pluse**
- **LaserWriter Elite**
- **Apple StyleWriter**
- **Ext. 101 Keyboard**
- **Gemini PS 410**
- **Radius Color Pivot**
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- **SONY 1304 (NE.25 DA)**
- **QMS PS 410**

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<table>
<thead>
<tr>
<th>Used Macs!</th>
<th>Upgrades!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac IIfx 0/0....... $3499</td>
<td>II to IIfx............ $1999.</td>
</tr>
<tr>
<td>Mac IIci 0/0....... 2499</td>
<td>SE to SE-30.......... 799.</td>
</tr>
<tr>
<td>Mac II 2/0........ 1799</td>
<td>800k to 1.44 mech. 235.</td>
</tr>
<tr>
<td>SE-20 w/kb........ 1049</td>
<td>Parts! Parts!......... Call</td>
</tr>
<tr>
<td>Mac IIfx 2/0...... 1999.</td>
<td>Logic bds., Power Supplies</td>
</tr>
</tbody>
</table>

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<th>Capacity</th>
<th>Performance</th>
<th>Price</th>
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<td>Quantum LPS</td>
<td>15 ms</td>
<td>$289</td>
<td>349</td>
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<td>WREN</td>
<td>16.5 ms</td>
<td>$339</td>
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<td>17 ms</td>
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Source: 1990 Macworld Subscriber Study

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In 1906 St. Vincent de Paul was founded to help people left homeless by the San Francisco Earthquake. Today, they're an organization that helps thousands of homeless people nationwide. By finding them shelter, medical care, rehabilitation, and jobs.

That's where Christine came in.
Before she got involved, St. Vincent de Paul worked with 75 other San Francisco social service agencies matching homeless people with available jobs. The Job Finders Alliance worked hard, but since they only communicated by memo and phone, it could take up to three weeks to match a qualified person with an open job.

By using her computer skills, Christine was able to put St. Vincent's on-line, and make the whole process more efficient. As a direct result of her efforts, today St. Vincent's has been able to find jobs for their people far more rapidly. And make better matches, because they have access to a comprehensive database.

Of course Christine is just one example. There are a lot of ways you can put your special computer skills to a much appreciated use, whether you specialize in telecommunications, system debugging, or basic software training. To know more, call CompuMentor™ at 1-800-659-3579. We'll put you in touch with a local non-profit organization whose needs are compatible with your area of expertise.

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Introducing HyperNet & HyperNet LTO. The network system that lets you expand and manage your network in seconds. Whether you are an AppleTalk or 10 Base-T user.

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The need to belong has always been a part of growing up. With the problems facing kids today and the growing number of single-parent families, that need has never been greater. As a result, gang membership is on the rise. The Boys & Girls Club gives kids the support and motivation they need to avoid gangs. The Club provides them with a sense of belonging and a sense of accomplishment. Please give to the Boys & Girls Club. The one “gang” worth joining.

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The Club that beats the streets.

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SYSTEMS

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Mac LC 2/40 1720
Mac IIx - 5 meg 4179
Mac Iici - 5 meg 2950
Mac Iici - 5/105 (Quantum) 3359
Mac IIi - 3/40 2625
Mac Portable 2/40 2650
Mac Portable 4/40 2880
Extended Keyboard 175
Quadra System Call
Powerbooks Call

MONITORS

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<td>Pivot Display for Built-in Video 729</td>
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SOFTWARE (cont.)

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<td>Quadra System Call</td>
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<td>Powerbooks Call</td>
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Radius 1700
Rocket Accelerator
Apple 649
Apple Apple 13” Highres
Seiko 569
Seiko CM-1445
SuperMac 1929
Platinum 19” Display 964
Platinum Two-Page Display 1239
Super Match 19” Color
Super Match 21” Two-Page Color Display 3031
Trinitron 16” Display 1860
Dual-Mode Trinitron 19” 2893
Thunder/8 1259
Thunder/24 3299
Spectrum 8.24 PDQ 899
Magnavox 499
Ext. Internal
Quantum 105 Pro 469 369
Quantum 210 Pro 835 710
Maxtor 120 399
Maxtor 213 659
Maxtor 340 1099
Syquest 44MB 519
Syquest 88MB 879
Internal Kit 29
Syquest 44MB cart. 75
SOFTWARE

Microsoft Word 269
Microsoft Excell 309
Aldus Pagemaker 497

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NEW APPLE LASERWRITERS
SCANNERS

Zoom FX9624 Plus 2400 BPS 139
Modem MX 2400S with SendFax 9600 BPS v.32 Turbo w/v.42bis 105
with MNP software 445
DOVE FAX MODEM 9624+ 295
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Plus shipping and handling, with membership.

Watch your children laugh and learn...with software that’s fun!

You've got the children. You've got the computer. Now you can bring the two together and turn leisure time into learning time with software that's fun!

The Learning Adventure Computer Club takes the work out of software selection for you. We review hundreds of computer programs for youngsters—invite children like yours to test them—then select only the ones that combine active fun with measurable learning in:

- MATH • SOCIAL SCIENCE AND GEOGRAPHY • SCIENCE
- LANGUAGE ARTS AND READING • CRITICAL THINKING SKILLS
- ...AND MORE IMPORTANT SKILLS!

Software Geared to Your Child's Age and Interests

To find out which programs are best for your child, check the colored square by each program: they're keyed in three age groups. Blue programs introduce your 3-7 year old to the computer with activities that arouse their curiosity...capture their imagination...and instill a lifelong love of learning. Red programs take the Three Rs into rip-roaring adventures for 7-10 year olds with programs developed to supplement their education and turn their weaknesses into strengths. Green programs stretch the minds of 10-13 year olds with sophisticated software that make serious challenges fun and rewarding.

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 off the retail price.

Then about every four weeks (12 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!

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SOFTWARE SELECTION GUIDE

ages 3-7
ages 7-10
ages 10-13+

EXCITING NEWSLETTER...FREE!

Charter members receive the Learning Adventure Computer Club Newsletter FREE. Featuring a host of recommended software for children 3-13+

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
   [ ] Other

3. Child's name ______________________

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.
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 IIs and two IIIs) 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
That pesky little wristwatch.

Choose another CD-ROM drive and you'll see a lot more of him. But choose the Allegro Drive from Optical Access and you'll lose the wait.

That's because our drives come with OAI SuperCache™ software that greatly increases Allegro's speed.

Put in a disc, and SuperCache reads essential parts of its directory and desktop files and stores them in RAM. With those in memory, Allegro can then spend most of its time accessing files, instead of looking for them.

Windows open instantly. Menus pull right down.

And in addition to speed, Allegro offers other plusses. Like a totally sealed drive and access door to keep dust at bay. Twin SCSI ports. A reliable, high performance Toshiba drive mechanism. And dual RCA jacks for playing audio discs.

Just what you'd expect from the first company in history to connect a CD-ROM to a Mac.

Get the whole story by calling 1-800-433-5133 or (617) 937-3910.

Or write to us at 800 West Cummings Park, Suite 2050, Woburn, MA 01801.

And stop looking at your watch.

SuperCache is a trademark of Optical Access International.

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### Business Software

<table>
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- **Microsoft Excel**
- **Microsoft Word**
- **Microsoft Office**
- **Microsoft Works**
- **WordPerfect for the Macintosh**
- **MacDraw II**
- **Calendar Creator**
- **Aldus PageMaker**
- **QuickTime**
- **FileMaker Pro**
- **MacProject**
- **MacWrite II**
- **Aldus FreeHand**
- **Microsoft PowerPoint**

### Entertainment Software

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- **Microsoft Flight Simulator**
- **SimEarth**
- **SimCity**
- **Bridge**
- **TOPS**
- **MacLink Plus**
- **White Knight**
- **TOPS**
- **MacDraw II**
- **MacWrite II**

### Utility Software

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- **After Dark**
- **The Norton Utilities for the Macintosh**
- **More After Dark**
- **Suitcase II**
- **Aldus FreeHand**

### Network/Data Communications

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- **DataViz**
- **White Knight**
- **TOPS**
- **Timbuktu**
- **MacLink Plus**
- **MacWrite II**
- **MacWrite II**
- **MacWrite II**
- **MacWrite II**

### Education Software

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- **Reader Rabbit**
- **Where in Time Is Carmen Sandiego?**
- **Where in the World Is Carmen Sandiego?**
- **Where in the USA Is Carmen Sandiego?**
- **Math Blaster**

### Add-In Boards

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<td>5</td>
</tr>
</tbody>
</table>

- **Macintosh IIC Cache Card**
- **Macintosh IISi NuBus Adapter Card**
- **Macintosh Display Card 8+24**
- **Radius TDP Interface**
- **Apple IIC Card Macintosh LC**

### Add-In Boards

<table>
<thead>
<tr>
<th>Months on Chart</th>
<th>Last Month</th>
<th>This Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

- **Apple IIC Card Macintosh LC**

### The AmCoEx Index of Used Mac Prices

<table>
<thead>
<tr>
<th>Machine/ RAM/Hard Drive</th>
<th>Average Sale Price</th>
<th>Monthly Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Plus/1MB/none</td>
<td>$550</td>
<td>+75</td>
</tr>
<tr>
<td>Mac Plus/2MB/20MB</td>
<td>$800</td>
<td>-25</td>
</tr>
<tr>
<td>Mac SE/2MB/20MB</td>
<td>$1000</td>
<td>+25</td>
</tr>
<tr>
<td>Mac Portable/1MB/40MB</td>
<td>$1600</td>
<td>+50</td>
</tr>
<tr>
<td>Mac Classic/2MB/40MB</td>
<td>$1700</td>
<td>+50</td>
</tr>
<tr>
<td>Mac SE/30/2MB/40MB</td>
<td>$2150</td>
<td>+350</td>
</tr>
<tr>
<td>Mac IIC/4MB/40MB</td>
<td>$1950</td>
<td>-100</td>
</tr>
<tr>
<td>Mac IIC/4MB/40MB</td>
<td>$1950</td>
<td>-100</td>
</tr>
<tr>
<td>Mac IIC/4MB/80MB</td>
<td>$4500</td>
<td>-200</td>
</tr>
<tr>
<td>Apple 12-inch B&amp;W display/board</td>
<td>$300</td>
<td>-25</td>
</tr>
<tr>
<td>Apple 13-inch RGB display/board</td>
<td>$700</td>
<td>0</td>
</tr>
<tr>
<td>Laser/Writer Plus</td>
<td>$1100</td>
<td>-100</td>
</tr>
<tr>
<td>Laser/Writer IINT</td>
<td>$1900</td>
<td>0</td>
</tr>
</tbody>
</table>

*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...”

$449 for built in video
(call for other options)

19” $799 with card.
21” $999 with card.

Don Rittner, President of M.E.C.C.A.
Editor of MUG News Service
issue of MacUser magazine. Featuring world class Trinitron quality so your most critical projects look flawless, the ProViews are still affordable priced.

"The ProView can handle my most demanding applications with ease; and best of all, I can afford it."

— Michael Levy

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

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

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-footprint drive, a super compact portable drive, or an 88 or 45 MB Syquest drive, Mirror's got the right stuff.

Tough customers all over choose Mirror products for quality, performance and value. We offer a complete line of Macintosh peripherals including hard drives, displays, scanners, printers, CD-ROM drives, and tape back-up units.

Call for our free catalog to read what the experts say about Mirror peripherals. Superior products, superior value, all backed by our famous 30-day, "love it or return it" guarantee.*

Nancy M. Benz, member

John H. Galligan, member

HARD DRIVES

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Ext.</th>
<th>Int.</th>
</tr>
</thead>
<tbody>
<tr>
<td>45MB</td>
<td>$329</td>
<td>$269</td>
</tr>
<tr>
<td>50MB(Q)</td>
<td>$349</td>
<td>$289</td>
</tr>
<tr>
<td>80MB</td>
<td>$369</td>
<td>$299</td>
</tr>
<tr>
<td>105MB(Q)</td>
<td>$409</td>
<td>$349</td>
</tr>
<tr>
<td>210MB(Q)</td>
<td>$799</td>
<td>$799</td>
</tr>
<tr>
<td>45MB Rem.</td>
<td>$499</td>
<td>N/A</td>
</tr>
<tr>
<td>88MB Rem.</td>
<td>$649</td>
<td>N/A</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>$599</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Call for other capacities. *Price includes one cartridge.

Nancy M. Benz, member

John H. Galligan, member

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Media: 1001

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Telephone: (612) 633-4450 Fax: (612) 633-3136
Address: 2644 Patton Road, Roseville, MN 55113

All prices subject to change.
*You pay shipping costs.
® Trinitron is registered trademark of Sony Corporation
Available 2/1992

Circle 125 on reader service card
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 $499
16" Trinitron $1,199
16" Trinitron, 8-bit $1,179
20" Trinitron, 8-bit $2,499
20" Trinitron, 24-bit $2,999
* for built-in video port

"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 the built-in video port of your LC, IIci, IIsi 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 IIci, IIsi 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

Hilary Koppel, member
Kensington introduces MasterStand and LaserStand to its complete line of space savers.

The more stuff we put on our desk the smaller it seems to get.

And with a CPU, keyboard, monitor, printer and mouse, there’s hardly room left for anything else.

But don’t give up. You can make your desk bigger with one, or a combination of space saving products from Kensington.

**MasterStand™** saves space by letting you slide your keyboard underneath your Mac or large screen monitor. It even turns a narrow desk, credenza or file cabinet into a workstation by extending the keyboard eight inches.

Want to store all your LaserWrite® II supplies in one convenient place?

With **LaserStand**, there’s room on one end for two reams of paper and up to 75 envelopes. The other end *(not shown)* holds two extra paper trays. And a convenient side compartment protects, organizes and hides printer cables.

For dot matrix printers, our **Space Saving Printer Stand** is the answer for maximum storage with a minimum footprint.

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.

For a free brochure on our complete line of space saving products, including **Keyboard Shelf**, **Keyboard Slideaway®, Maccessories® Tilt/Swivel and SuperBase®,** call 800-535-4242. Outside the U.S. 415-572-2700.