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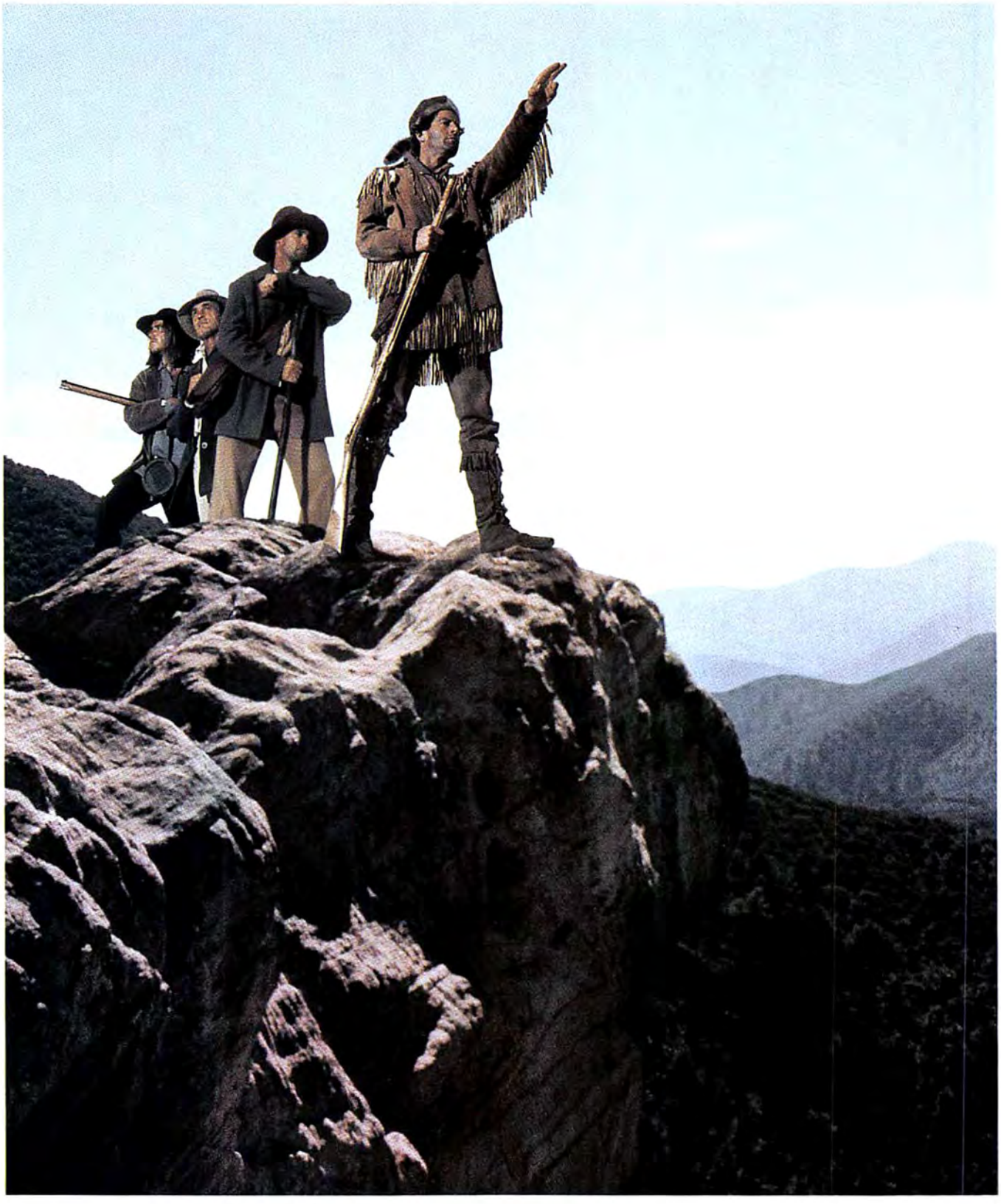

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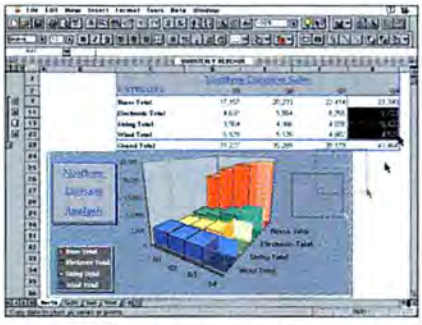

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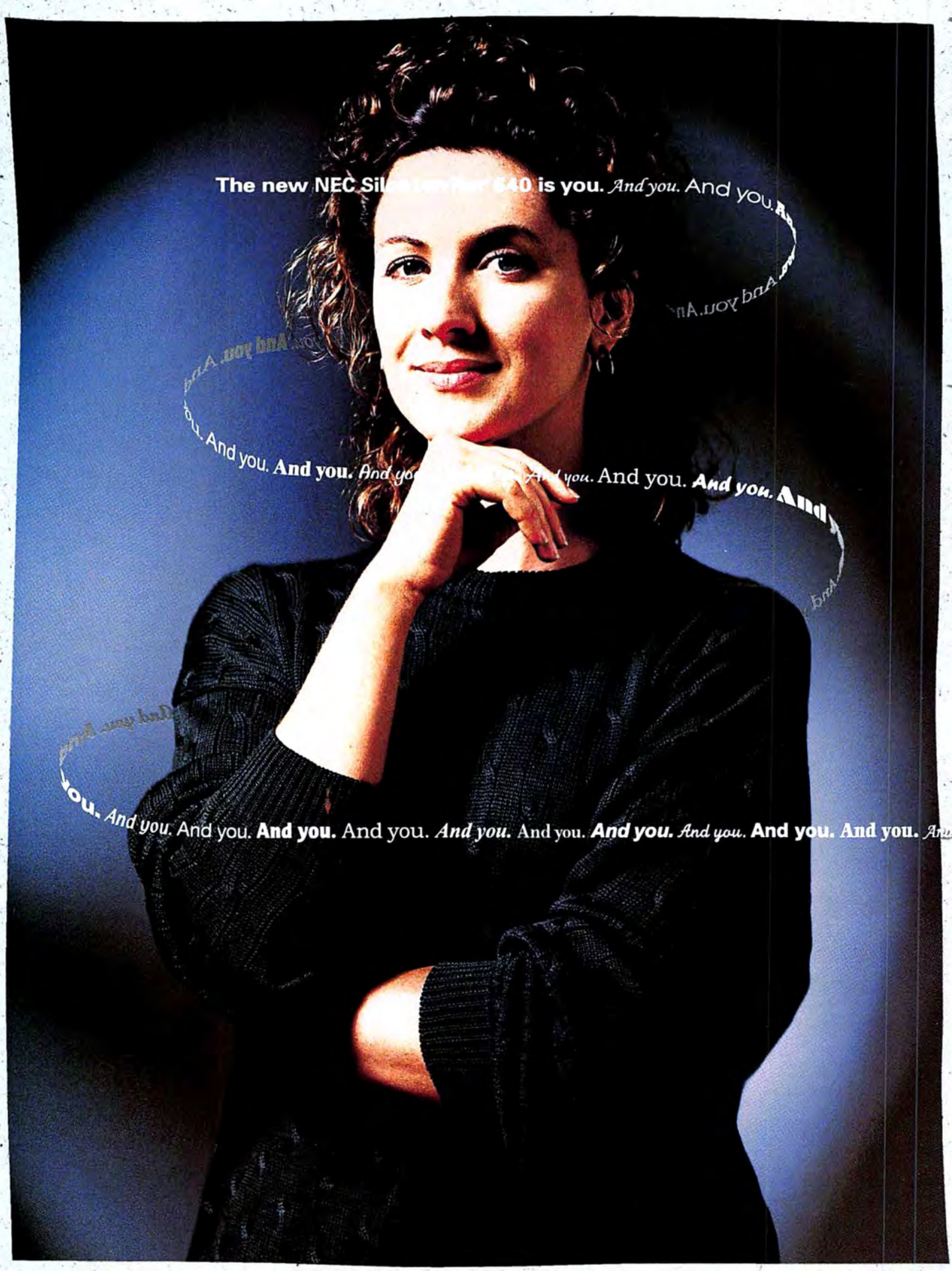

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Contents

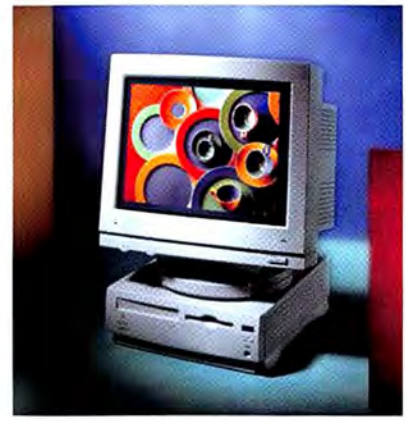
MACWORLD THE MACINTOSH® AUTHORITY NOVEMBER 1994

Features

86 Desktop Videoconferencing
BY MATTHEW LEEDS Is the promise worth the price? Macworld Lab tests four desktop videoconferencing systems for sound and image quality.

96 OpenDoc and OLE 2.0
BY GALEN GRUMAN Apple and Microsoft plan to revolutionize the way we use applications—but will their competing visions for the future be a change for the better?

104 Big Screen Close-up
BY CHARLES SEITER AND TIM WARNER Macworld Lab puts 22 two-page color displays through a battery of real-world and objective tests to find the winners in price, features, and quality.



Apple's newest, the Quadra 630, reviewed on page 52.

Macworld Lab tests two-page color monitors, page 104.

News

33 MacBulletin

34 News Future Mac clones • HP intro's Color LaserJet • Quadruple-speed CD-ROM drives, and more

41 Power Mac News Power Mac bugs and turkeys • Shareware rolls around, and more

43 New Products

Opinion

19 State of the Mac
BY ADRIAN MELLO The upcoming melee between OpenDoc and OLE.

25 Letters

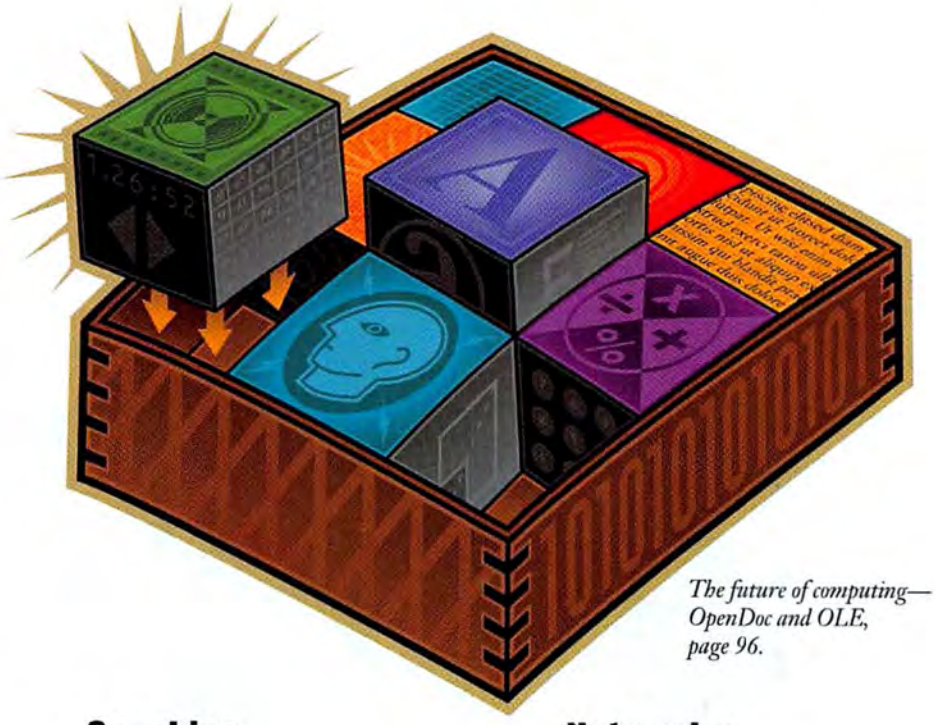
157 The Desktop Critic
BY DAVID POGUE A new crop of Newton software.

163 The Iconoclast
BY STEVEN LEVY Oh, brave new eWorld!

169 Conspicuous Consumer
BY DEBORAH BRANSCUM Apple's mail-order moves.

258 Wise Guy
BY GUY KAWASAKI Stop the presses! Jobs is back.

ON THE COVER
Photograph by Stan Musilek.



The future of computing—OpenDoc and OLE, page 96.

Graphics

114 **News** 36-bit scanning for a 24-bit price • Three image-editing XTensions • Desktop service bureau, and more

118 **Expert Graphics**
BY CATHY ABES Graphics professionals share their secrets.

122 **Special Effects in Photoshop**
BY DEKE McCLELLAND We evaluate nine Photoshop plug-in filter collections—practical and versatile tools for the graphics professional.

At Work

132 **News** Three-D spreadsheet • Quicken 5.0's improved look • Bargain-basement electronic archiving, and more

135 **Working Smart**
BY JIM HEID The sticky business of label-making.

139 **Quick Tips**
BY LON POOLE Tips, tricks, and shortcuts.

Networks

144 **News** Apple offers TCP/IP access for ARA • Lotus to add Mail to Notes • Network analysis on the PowerBook 500 series, and more

148 **Piracy Prevention**
BY KRISTI COALE Illegal software can cost your business a fortune. Use these network-management tools to keep your company on the up-and-up.

153 **PowerBook Notes**
BY CARY LU A handful of Ethernet solutions.

Buyers' Tools

173 **Editors' Choice**
Top picks from our comparative articles.

177 **Star Ratings**
Hardware and software reviews at a glance.

193 **Streetwise Shopper**
Hardware and software bargains: discounts, bundles, upgrades.

14 **How to Contact Macworld**

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Reviews

52 **Quadra 630**
Macintosh computer

54 **MiniCad 5**
CAD software

55 **Dabbler 1.0**
Art-education/paint software

57 **Apple Personal Diagnostics**
Hardware-diagnostics utility

59 **ScanPrepPro 1.2**
Photoshop add-on

59 **LogoMotion 1.0**
Animation tool

61 **TeamFlow 3.1**
TQM flowchart software

63 **First Things First Proactive 1.1**
Scheduling program

63 **Kekulé 1.1**
Science software

65 **Drive7 3.0**
Hard drive–formatting utility

67 **OmniPage Professional 5.0**
OCR software

67 **PowerAgent 1.1**
Task-automation software

69 **White Knight 12.0**
Telecommunications software

70 **ClickBook 1.1**
Print utility

70 **PowerPort Mercury/PB 500 series**
Fax modem

75 **Terrazzo 1.0**
Plug-in graphic-effects module

75 **CheckPost 1.3; LaserCheck 1.0**
Imagesetter-simulation software

77 **The Multimedia Workshop 1.0**
Multimedia presentation tool

77 **Decision Analysis 2.5**
Decision-assistance software

79 **DaynaPort Pocket SCSI/Link; Pocket EtherTalk Adapter**
Network hardware

79 **MicMac 2.0v1**
Recording software

81 **MATLAB 4.1**
Numerical math software

81 **PhotoMatic 1.01**
Photoshop utility

82 **Mac Keyboard Deluxe**
Keyboard

82 **Maxima 3.0**
RAM disk

The detail of EPSON's 4800 dpi, scanner really stands

Actual 30-bit scan

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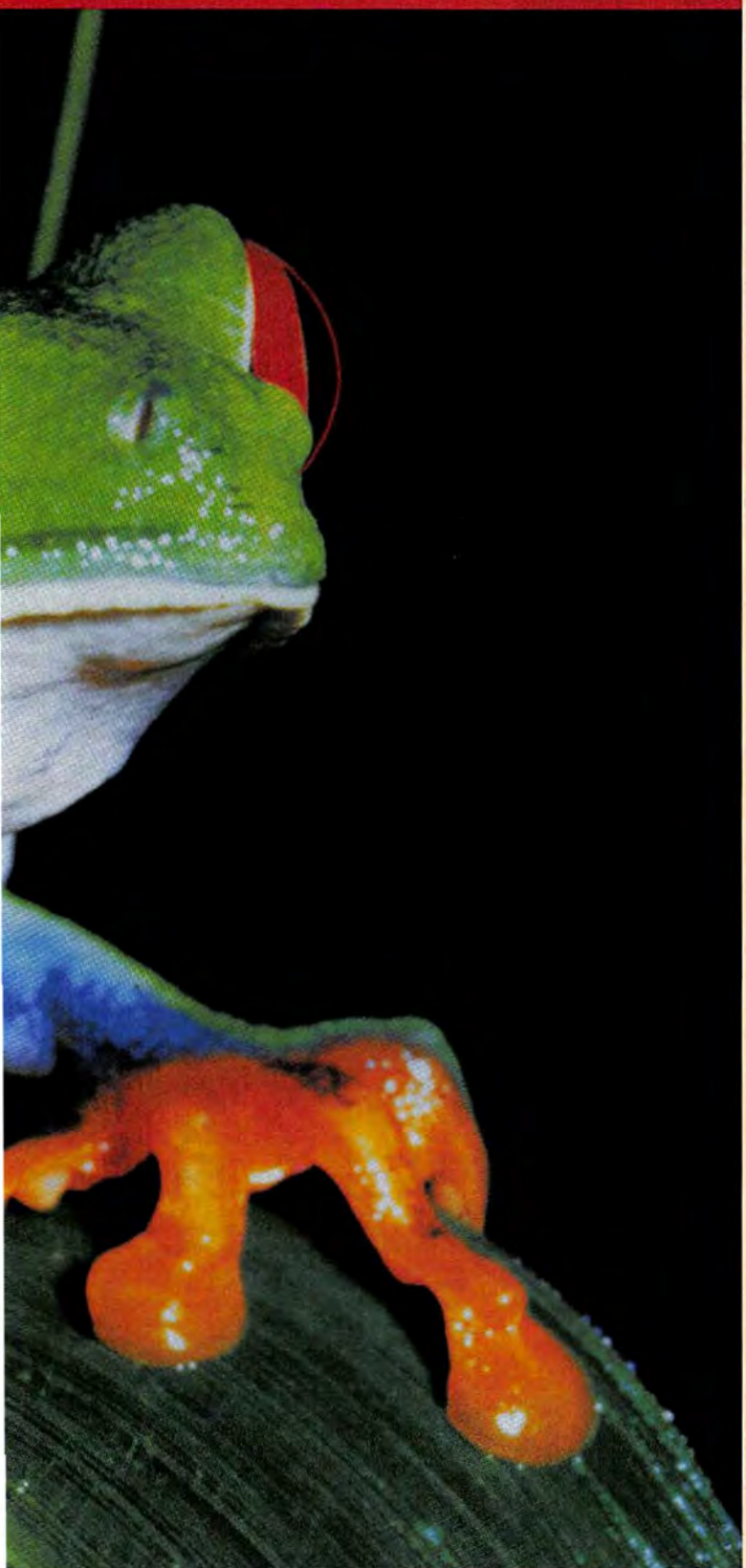

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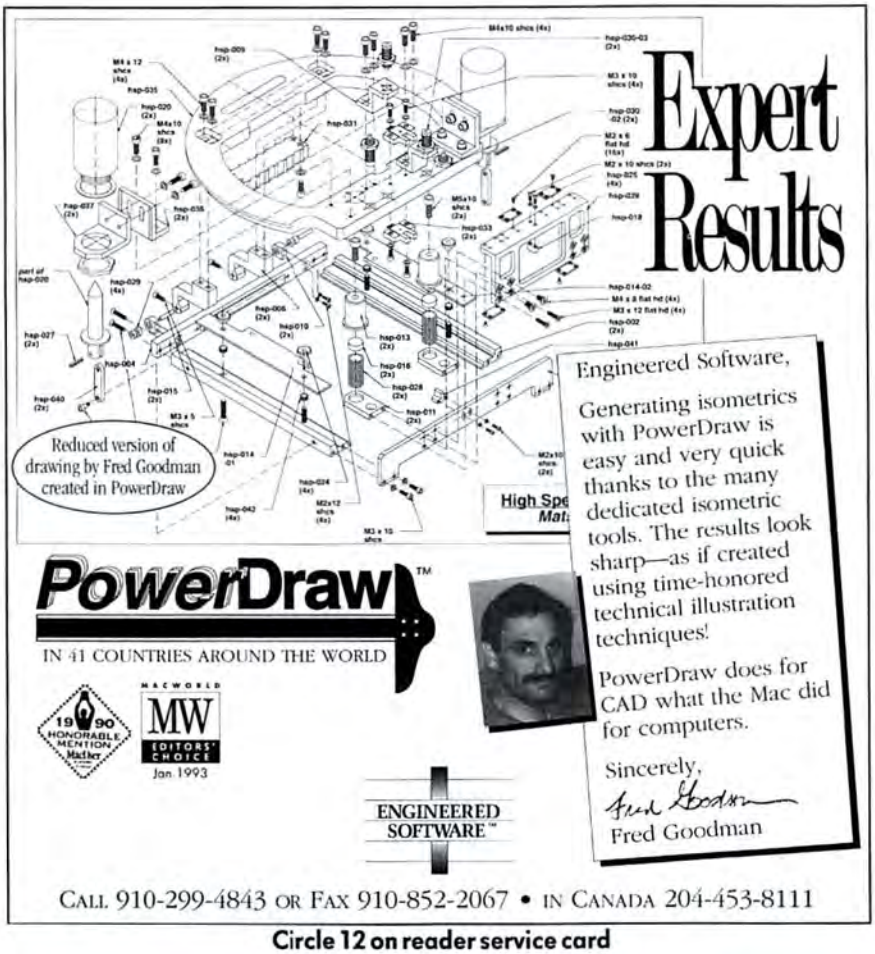

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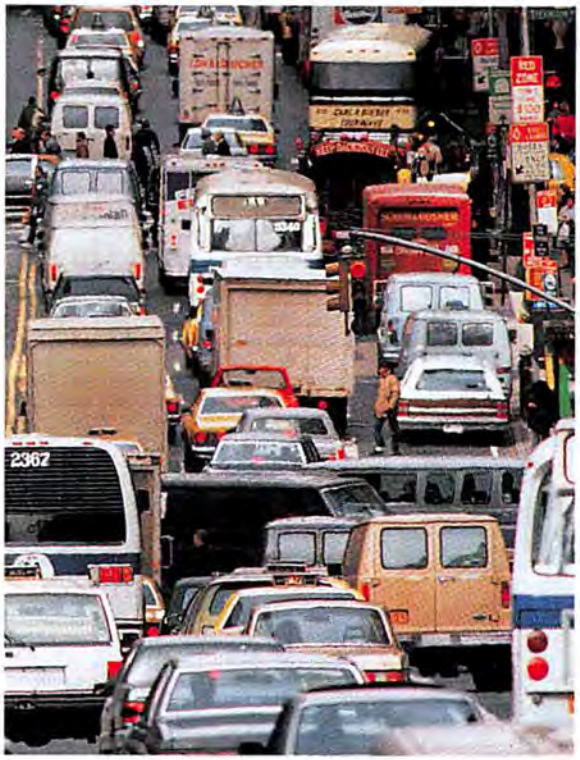

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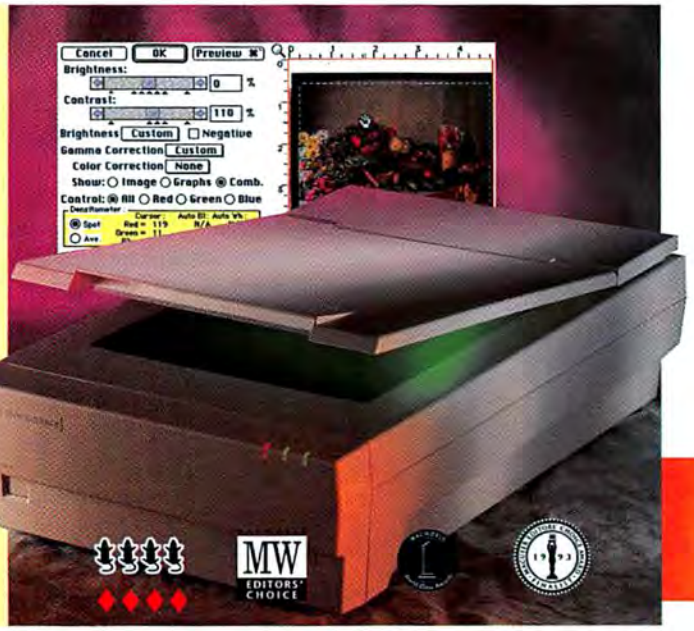

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Circle 57 on reader service card

BY ADRIAN MELLO

The Document Range War

OLE and OpenDoc battle for developers' attention

FOR THE LAST YEAR OR TWO Apple has been describing OpenDoc as an ambitious new way of letting customers unify documents and applications by breaking down the artificial constraints of separate application programs. OpenDoc promises to help users focus on their documents by letting them access many different application tools in the same document without moving in and out of separate applications. Microsoft has its own technology, called OLE (Object Linking and Embedding), that lets users work in one document with different application tools. OLE is here today, but the upcoming OpenDoc appears to be a much more elegant solution. When OpenDoc arrives, Microsoft's OLE 2.0 programs should appear clunky and brutish by comparison. (See the feature "OpenDoc and OLE 2.0" in this issue.)

There is an appealing nobility about OpenDoc's approach: it is more efficient and more transparent for end users, and it will be nonproprietary. In my estimation, OpenDoc is clearly the better technology for end users, but that doesn't mean OpenDoc will garner more support from developers who are considering how to use either or both technologies to compete. But as competition has increased and profit margins have fallen, developers have become much more careful about how they commit their resources.

Development Effort

To make the document-centrism of OpenDoc and OLE 2.0 a reality, developers must redesign their programs so that each can first communicate to other modules what objects it can handle, and then the various modules must treat those objects consistently so users don't get confused. This object technology will have to be implemented at the system level, like QuickTime and the Finder. Developers will have to bundle their extensions with OpenDoc or OLE; Apple does plan on integrating OpenDoc into the next generation of the Mac OS, due out about a year from now.

Implementing OpenDoc means writing programs from scratch: developers must dedicate small tools to individual tasks and make sure those tools work together. If you have a spelling-checker tool and a hyphenation tool from different vendors, you want both to work with the text-editing tool you're using. To implement OLE, developers must either extract functions from a big program and turn them into independent programs or they must design tools that plug into a big program.

Windows programmers have complained about OLE 2.0 ever since Microsoft published the specification nearly two years ago, because it requires them to manage cross-application interactions they never had to worry about before, and at the same time it forces them to change how their current software works. Plus, OLE is a moving target: Microsoft keeps promoting development for new OLE versions planned for its forthcoming Chicago (Windows 4.0) and Cairo (Windows NT 4.0) operating systems. OpenDoc developers are likely to face similar hurdles. Apple and its OpenDoc partners have said that OpenDoc will also be revised to add new features about a year after it ships.

One illustration of the object-software challenge is Microsoft's own experience. The company's Office programs don't use OLE objects everywhere they could. For example, the new versions of Excel, Word, and PowerPoint all use OLE 2.0 but still have separate spelling checkers; and PowerPoint and Word have their own table tools. Even mighty Microsoft has limited resources, and full integration of OLE in these three programs (for both Windows and the Mac) would have required immense work. It will be several software generations before Microsoft Office fully exploits OLE 2.0.

Some of the Players

Outside of Apple, WordPerfect is OpenDoc's biggest booster—because it represents a way to break up Microsoft's near-monopoly of the word processor market, by getting users to switch to OpenDoc-compatible tools. A few companies, including Claris, CE Software, and Frame Technology, have committed to using either or both object technologies. And although OpenDoc got better reviews than OLE from most developers *Macworld* surveyed, even pro-OpenDoc developers are hedging their bets: "It's not really a one-or-the-other type of choice. No one, including Claris, knows which one will be the de facto standard," explained Larry Slotnick, vice president of development for Apple's Claris subsidiary.

To get a better idea of how a document-based architecture is likely to grow, *Macworld* asked 20 companies about their plans for OpenDoc and OLE 2.0. Most companies were fairly reserved and gave nonanswers like, "OpenDoc is a promising technology that we are exploring." About a half dozen gave no answers at all. A few explained their caution.

• Typical was a comment from Peter Warren, marketing director at Quark: "We offered AppleScript and [UserLand]

continues

GLENN MITSUI/STUDIO MD

Frontier [scripting] support a while ago but are only now seeing useful scripts. We expected more end-user support. And we're not sure if OpenDoc will have the same time lag before anyone cares."

• David Schargel, president of Aladdin Systems, had other concerns: "Will vendors be able to price [OpenDoc] parts high enough to justify their investment? How will parts be distributed?"

• The bottom line for Steven Saltzman, then president of Now Software, was the payoff for investing in object technology. "Since it's a fair amount of development effort, we're not going to commit to one [technology] until we've got a pretty strong grip on which is ultimately going to win. It may be that both will win," he said.

• Aldus is looking at implementing the two technologies in future products, but said it's too early to commit to specific products or times.

At present, Microsoft's OLE 2.0 has generated much interest, if not acclaim, among developers because OLE makes integrating multiple programs easier. But that enthusiasm is mostly among Windows developers, who see linking technology as a way to get around the issues of data transfer in a heterogeneous world. Expect OLE 2.0, if it goes beyond Microsoft programs, to be adopted first by cross-platform developers who want Macs to have the same capabilities as Windows systems. Aldus may be one of those, since it has demonstrated prototype software with OLE 2.0 compatibility.

OpenDoc is a more open question because it is still a promise. So why would developers choose OpenDoc over OLE when they can take advantage of OLE now? Several technical advantages make OpenDoc an appealing alternative, including the ability to keep multiple drafts, and an emphasis on smaller tools (and thus lower RAM requirements and faster switching between tools).

Perhaps the most important reason why developers may favor OpenDoc is the strong anti-Microsoft feeling in much of the development community. This feeling is fueled by the fear that cooperating with Microsoft today could mean being overwhelmed later by the company's seemingly endless expansion into ever-more application areas. The fact that OLE is controlled by one industry-dominating vendor, Microsoft, alienates major competitors such as Lotus, WordPerfect, and to a lesser extent, Apple.

Despite misgivings about Microsoft, developers are seriously considering support of OLE. Microsoft wields so much influence that developing for a competing technology may not make financial sense. As much as developers might prefer alternatives to Microsoft, they need to maintain high compatibility, especially in the PC market. That affects the Mac market, since so many developers make Mac programs function-compatible with their Windows versions.

Apple and other advocates of OpenDoc will have to convince developers that there is a compelling financial reason to develop for OpenDoc. The switch from big programs to smaller object-oriented tools won't be easy. The next step is for Apple to support developers with well-chosen technical and marketing programs for OpenDoc. The advantages of innovation can be realized only if developers translate technology into tangible business opportunities. Until then we may have to wait patiently while the new document-based technologies slowly evolve. **m**

Additional reporting by JIM FEELEY, GALEN GRUMAN, and JOANNA PEARLSTEIN.

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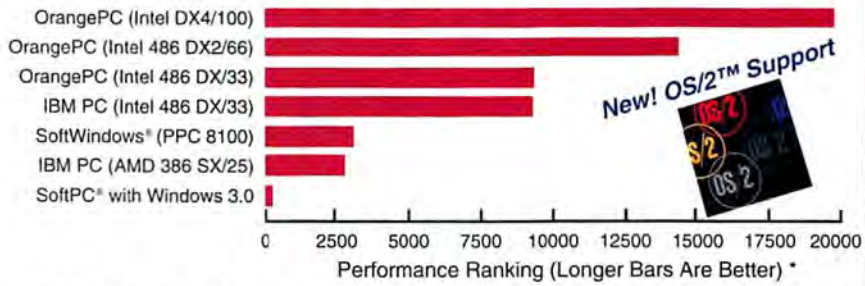

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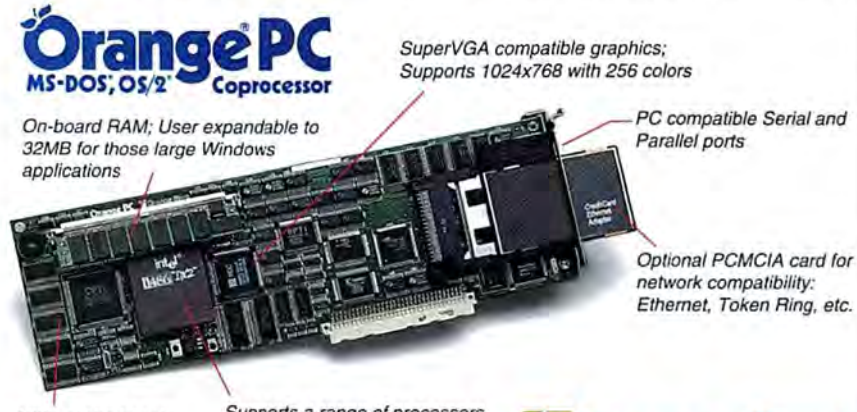

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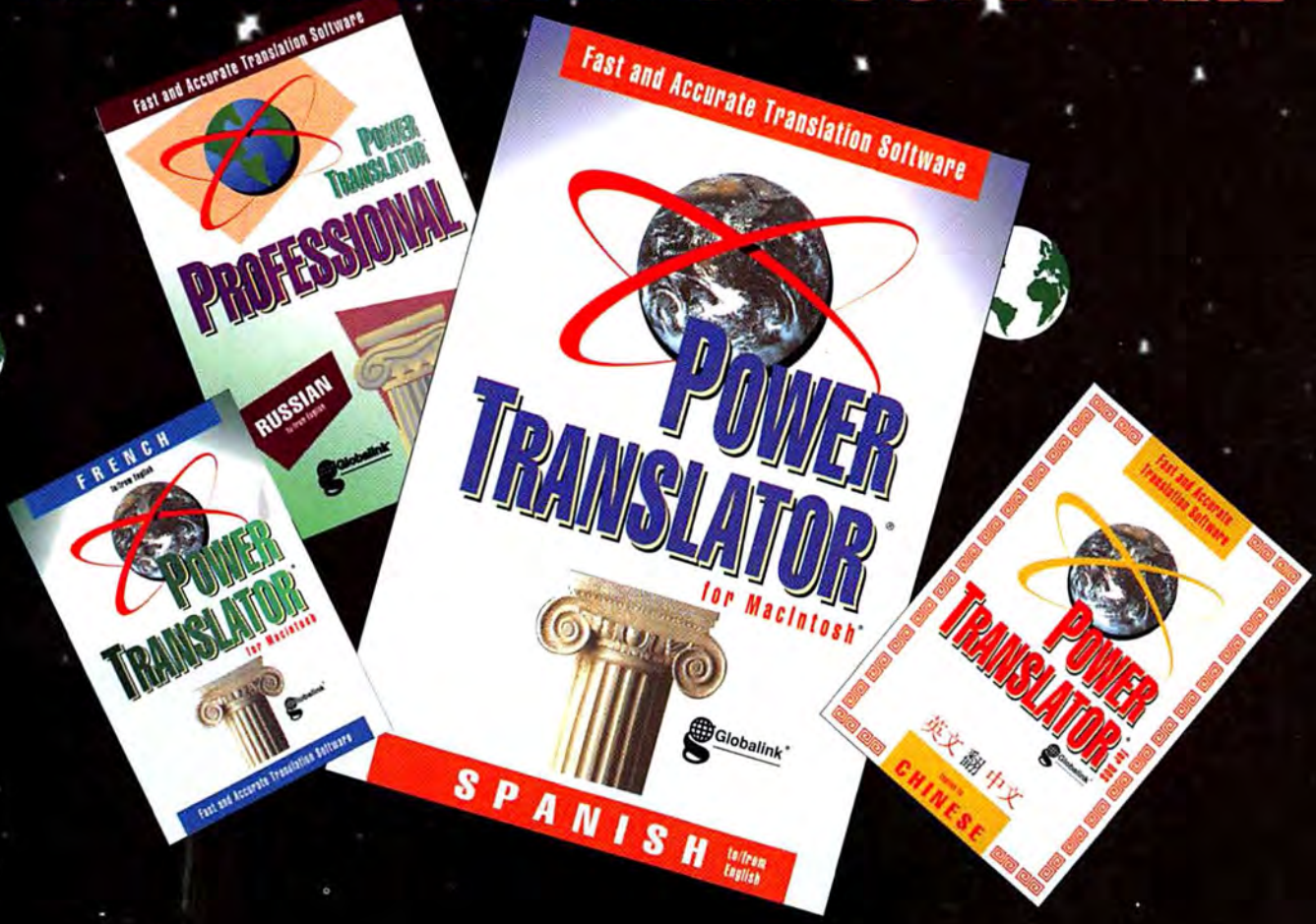

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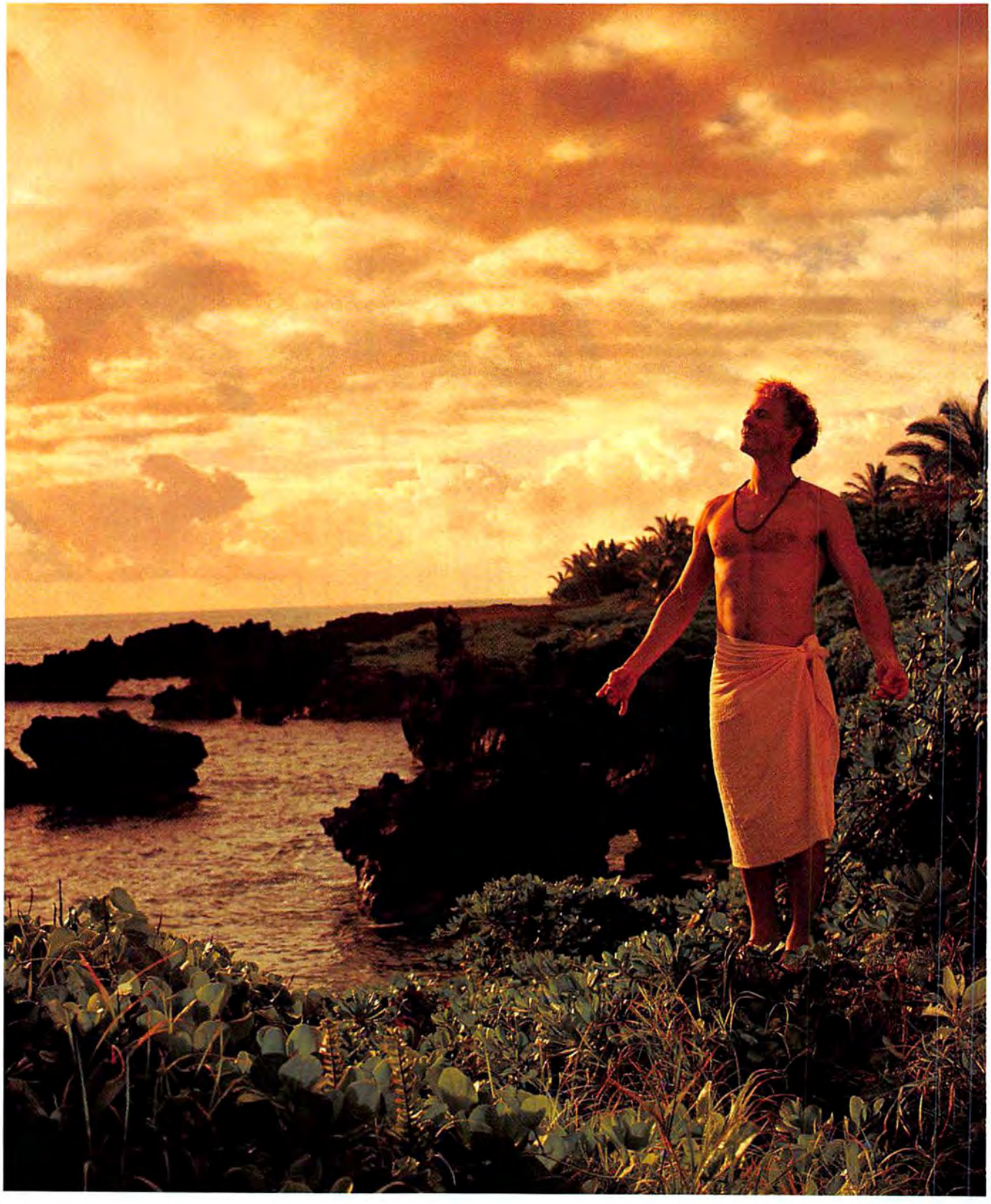

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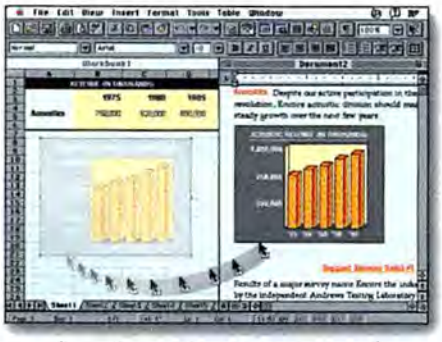

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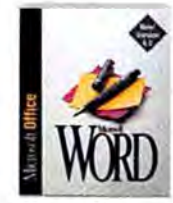

Microsoft Office

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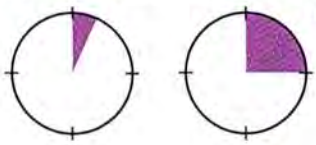

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Letters

Macworld Online

I WOULD LIKE TO CONGRATULATE the staff of *Macworld* on the contents and organization of the August issue. The material on the Internet and the information highway was the most informative I have yet read. Many thanks.

Benis Frank
via America Online

YOUR SPECIAL ONLINE ISSUE DID A fairly good job of covering the bases that a beginning netter must consider, but it also confused a few issues. First, the Internet sidebar to Joanna Pearlstein's online-services guide did not fairly assess the University of Minnesota's TurboGopher application ("How to Ride the Internet"). The caption to the TurboGopher screen shot implies that TurboGopher is slower than other options. Since the legendary slowness of Mosaic (the World Wide Web browser) gets no mention, one could conclude that Mosaic is peppier than TurboGopher. But the reverse is true: Mosaic is nearly unusable over SLIP lines, while TurboGopher is about as fast as an America Online (non-SLIP) connection.

Second, Mel Beckman's article, "Pick the Right Communications Software," omitted Aladdin's emulator, SITcomm. Not only does this program integrate StuffIt file compression, but its utilization of AppleScript (instead of a proprietary scripting language) makes SITcomm one of the most talked about communication programs on the Net.

Michael Hon
via the Internet

WAKE UP, *MACWORLD!* I HAVE BEEN using America Online for almost two years (and have tried CompuServe, GEnie, Prodigy, and some BBSs), but I was blown away when I got a PPP account and started using Mosaic and a host of other Internet services. For $35 a month, I get complete Internet access (as opposed

WARD SCHUMAKER

to the limited service offered by Delphi and others). By comparison, AOL would cost me, on average, at least $45 a month—and it's limited to 9600-bps access speed, is censored and centralized, and makes you pay by the minute.

Stephan Moskovic
via the Internet

It's true that using the Internet directly can be cheaper than subscribing to an online service, but direct access is also harder to configure and navigate—and it's not always faster.

We are awake, by the way; we just keep dozing off while waiting for Mosaic.—Ed.

YOU NEGLECTED TO MENTION THAT America Online makes certain users pay a surcharge for connecting. I live in Alaska and get charged 20 cents per minute for connecting.

John Boyarsky
via America Online

America Online charges a 20-cents-per-minute telecommunications surcharge for users who connect from outside the 48 contiguous United States, including Alaska, Hawaii, and Canada. According to America Online, the extra cost comes from the phone companies providing the access.—Ed.

ONE TOPIC I DID NOT SEE COVERED in your guide to online services was hours of operation. I've been a member of America Online, CompuServe, and Prodigy for years. AOL seems to shut down from 5 a.m. to 8 a.m. every day—a critical time for my E-mail and news-gathering activities. Prodigy seems to shut down around 1 a.m. to 4 a.m., which is no great inconvenience (but Prodigy is). CompuServe (my favorite) is always accessible.

Yvonne Oliver Bowers
Glastonbury, Connecticut

America Online's normally scheduled system maintenance times are Mondays, Wednesdays, and Fridays from 4 a.m. to 7 a.m. Eastern Standard Time (EST), and AOL reserves the right to take the system down any day of the week during those times. Prodigy's maintenance also occurs between 4 a.m. and 7 a.m. EST; the service may shut down during those times on any day of the week as well. A CompuServe representative said users aren't affected when that service undergoes maintenance.—Ed.

I HAD TO LAUGH AT YOUR COST chart's definition of "heavy use" as being 20 hours a month ("How Much Do Online Services Really Cost?"). In my first month using America Online, I was online for more than 40 hours; during my second month I topped 90 hours, sending my bill over $300. I've stabilized now at about 50 to 60 hours a month; I'm online every day for at least an hour, and some days more.

Steven Long
Felton, Delaware

Taligent Tangential

I WAS SURPRISED TO FIND NEXTSTEP and OpenStep completely ignored in "Taligent Rising" (*News*, August 1994). The irony, of course, is that NextStep does today what Taligent promises for tomorrow. In addition, OpenStep—one result of the alliance of Next and Sun

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CORRECTIONS

- *The correct phone number for Fauve Software, maker of xRes, is 919/380-9933* (MacBulletin, *September 1994*).
- *Microsoft Works 4.0 does not include copies of Bookshelf and Encarta* (At Work *news, September 1994*).
- *The August 1994 review of The Cruncher incorrectly stated that the product requires operators for certain function types. In fact, The Cruncher uses standard formulas for calculations.*
- *Regarding our July 1994 "Virus Killers" feature: MacTools scans StuffIt archives, but not Compact Pro archives. MacTools also supports automatic updating of virus signatures when a user logs on to the server and has a reporting feature so that the administrator can see which users have updated their antiviral software and which have not.*

After the article appeared, we discovered that our tests were done with slightly altered versions of the two Mosaic/FontFinder Trojan horses. The alterations render the two Trojan horses nondestructive (when launched, they crash the system, but do not affect data). MacTools failed to detect the altered versions, but it does detect the original versions of these Trojan horses.

Microsystems—will bring Next's object technology to other operating systems. Sun's Solaris and DEC's OSF/1 will both feature OpenStep layers within the next year. By the time Taligent reaches beta testing, NextStep will be running natively on Motorola, Intel, PA-RISC, and SPARC-based hardware. And OpenStep will be implemented on these same architectures, plus Alpha AXP and PowerPC.

Apple and IBM are foolish to ignore this proven technology. Instead, they would rather waste millions of dollars reinventing the wheel. Don't be misled by the Taligent propaganda: with an estimated one million seats installed by the time Taligent ships, NextStep and OpenStep are the future of platform-independent, object-oriented computing.

Robert A. Wyatt
Editor-Publisher, Next In Line
via the Internet

MessagePad Musings

DAN MUSE LAMENTED IN HIS REVIEW of the Newton MessagePad 110 that he, and most of the business world, do not have a reason to use Apple's PDA (*Reviews*, August 1994). How delighted I am as a public school teacher to be—for once, perhaps—on the cutting edge of a technology! I can wander the classroom and jot down observations of children's behavior, which I can then export and print for later discussion with a child's parents. Perhaps business types could gather some ideas by visiting schools that are using the Newton.

Mike Mitchell
via America Online

WHAT A TEDIOUSLY CHEAP WAY FOR Dan Muse to conclude his review of the Newton MessagePad 110. Has no one any imagination left? It's like hearing all over again the comments made about the first Macs.

When one understands how and why to use a Newton and ceases to impose one's own unreal wishes on it, things start to make sense. It's not for using with Word or FileMaker, and it's not an origination tool; rather it's an exceptional organizational and communications tool. I previously used a paper organizer, which now sits in a drawer.

Agreed, many improvements could be made, but Newton will oust competing approaches just as the Macintosh philosophy has ousted DOS. In a few years we will look upon conventional organizers with the same derision we now do command-line interfaces.

Joel M. Sciamma
via CompuServe

Hooray for First Class

KUDOS TO *MACWORLD* FOR GIVING FirstClass Client and FirstClass BBSs the praise they deserve (*The Desktop Critic*, August 1994). FirstClass offers the most Mac-like service available in a BBS, and I've never been on one I didn't like. In fact, I've given up using all other types of BBSs and now use FirstClass exclusively.

The only thing your article lacked was a mention of Tyrell Inc. in Rochester, New York (716/461-5157). Sysop 'JF Sebastian' and his crew have worked countless hours to give us tons of files, conferences, and (after we used it for a little while) friends.

Marc Drumm
Penfield, New York

REGARDING THE ABILITY TO DOWNload material while simultaneously browsing through a FirstClass BBS's other areas, David Pogue writes, "Try *that* on America Online." Actually, I do just that on a regular basis, and many others do as well. I use an extension called

continues

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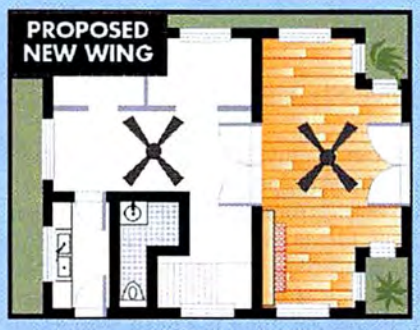

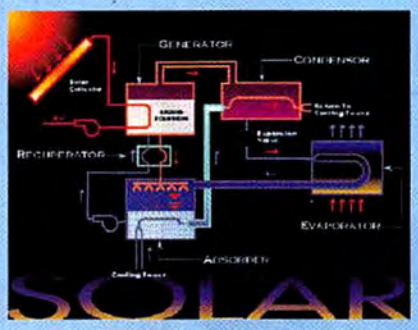

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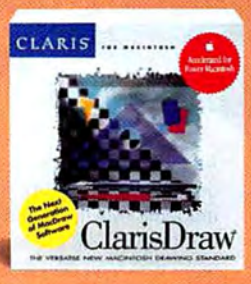

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Tripp Elliott
Knoxville, Tennessee

Ear Phone Solution

JIM HEID'S REVIEW OF JABRA'S EAR Phone Streamline AV mentioned that you could not hear the computer's other sounds, such as alert beeps and CD playthrough, unless you wear the Ear Phone or unplug it to reactivate the internal speaker (*Reviews*, July 1994).

Another option may be more viable. Purchase a stereo minisplitter from Radio Shack or an audio store, plug the Ear Phone into one of the splitter's jacks, and connect a pair of external stereo computer speakers into the other jack.

I like to have external speakers connected to my computer if I play audio CDs. Instead of groping behind my Mac for wires, I now simply take off the Ear Phone when I'm not using it and turn off (or lower the volume on) the external speakers when I hold a private call or secretly play my favorite game.

Andrew K. Jung
Victoria, British Columbia, Canada

Levy Strikes Home

JUST RECEIVED YOUR AUGUST ISSUE IN the mail and read Steven Levy's article on electronic shopping (*The Iconoclast*). Levy hit the nail on the head with his remarks. Ninety-nine percent of online shopping efforts have missed the mark. Catalog shopping has been with us for over a hundred years—why hasn't it replaced retail shopping?

Places like the Compact Disc Connection and the Internet Shopping Network are pioneers that have a chance of being around in a few years, but Prodigy, CD-ROM catalogs, and the others don't have a chance until they "get it."

Phil Trubey
via the Internet

Letters should be sent to *Letters, Macworld,* 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically, to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), eWorld (Macworld), or AppleLink (Macworld1), or via Internet (letters@macworld.com). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld.* m

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LATE-BREAKING NEWS

MacBulletin

Adobe-Aldus Update The merger between Adobe Systems and Aldus Corporation became final in early September. The combined companies will go by the name Adobe Systems and will shed some 200 to 400 employees in the process. To obtain FTC approval for the merger, the companies had to divest themselves of Aldus FreeHand. Altsys Corporation, which developed and updated FreeHand for Aldus, will regain control of the illustration program in January 1995. The FTC had maintained that without the FreeHand transfer, the merger could have led to higher prices and less innovation for professional illustration software.

The (Hand)Writing on the Wall Palm Computing, one of the first names in the PDA game, has announced its Graffiti handwriting-recognition software for the Newton. Graffiti requires users to learn a simplified alphabet made up of distinctive pen strokes; the company claims that experienced operators can scratch out 30 words per minute with a recognition rate close to 100 percent. The software will be available near the end of September for $79. Palm Computing, 415/949-0147.

Merger, Layoffs at Radius/SuperMac Radius and SuperMac officially became one company on August 31 after stockholder approval of the merger. The resulting company will be called Radius. Earlier, the companies had announced the elimination of 250 jobs, partly a result of contracting out production and partly due to duplication of effort.

Faster, Cheaper Wireless As cellular-communications carriers deploy TCP/IP-based Cellular Digital Packet Data (CDPD) service, PowerBook users will be able to make 19.2-Kbps wireless links to the office computer network—and pay only for actual transmissions, not for the entire duration of the hookup. At press time CDPD service was available in nine U.S. metropolitan areas; the cellular companies are working toward nationwide service. A CDPD modem is required. Sierra Wireless (604/231-1100) makes the $1195 PocketPlus, the first CDPD wireless modem for the Mac; the compact device also supports 14.4-Kbps V.32bis data and V.17 fax transmissions over circuit-switched cellular and telephone wires.

Big Stat for Mac SAS Institute, until now known to Macintosh users for the graphical exploratory data-analysis package JMP, is developing Mac versions of its entire line of traditional statistics software. The SAS line, one of the leading stat systems for minicomputers, includes about 20 modules. The first Mac SAS modules should be available in 1995. Pricing was not set at press time. SAS Institute, 919/677-8000.

Accelerator Market Slows Down Under pressure from Apple's low-cost, high-performance Macs, accelerator companies are falling by the wayside. Fusion Data Systems has shut its doors while it looks for a buyer for the company's assets, and at press time Harris Labs was not answering its phones. Rival firm Brainstorm Technologies said it will give free technical support to owners of Fusion's TokaMac or Harris's Performer accelerators, as well as offer a $99 upgrade to Brainstorm's own line of Plus and SE accelerators. Brainstorm, 415/964-2131.

Novell Cuts Jobs Novell announced plans to cut 1750 jobs within its organization, newly merged with WordPerfect Corporation. At press time the company would not specify which departments will be affected, but a spokesperson said the move will eliminate duplication of effort. The leaner company plans to employ about 8250 people by the end of January 1995. m

News

EDITED BY TOM MORAN

IN THIS ISSUE

p. 36 Quad-Speed CD-ROM Drives **p. 37** HP's Color Ink-Jets **p. 37** Apple's 3-D Plans

p. 38 Multimedia Utilities **p. 38** FWB Revises ToolKit

p. 39 Now Utilities 5.0 **p. 39** HP's First Color Laser **p. 39** DynaTek Drives

Spindler Says Clones on the Way

WILL CROCKER

After a year on the job and with the challenge and opportunity presented by the upcoming new Windows version, Apple's president and CEO, Michael Spindler, recently outlined Apple's goals and directions. With Spindler were Apple's division heads, who detailed their product areas' plans. Apple has encapsulated its strategy in the slogan "stand out and fit in," meaning Apple intends to exploit unique Mac capabilities while promoting interoperability with PCs and other computers. That's not a new goal for the company, but Apple finally seems poised to shift from talk to action.

Clones Are Coming

Perhaps the most radical action will be licensing the Macintosh OS to other vendors, who can then develop Macintosh-compatible computers. Apple's vice president for licensing, Don Strickland, said on September 7 that at least two clone licenses have already been signed, but he declined to name the licensees. Industry rumors name Motorola in the United States, Acer in Taiwan, Vobis in Germany, and Olivetti in Italy.

Strickland added that Apple will not restrict Mac OS licensees to narrow geographic areas or markets; they will be free to sell anywhere. But Apple expects that near-term clones will be sold only where they might enjoy a competitive edge—in regions and segments where Macintosh sales are weak, such as large U.S. businesses.

Strickland confirmed that Apple will not license the Mac OS anytime soon to the top non-Mac PC makers, which include Compaq, Packard Bell, IBM, Gateway 2000, and Dell. Instead, Apple has targeted midsize computer makers, ranking between 8th and 20th in worldwide sales.

Strickland said that licensees will set the timing of announcements. He estimated that two to three announcements will come this year, and another three or four by early summer, 1995. Apple expects to expend considerable resources supporting clone vendors, and will therefore limit their number to about six in the first year.

Mac clones will not be able to use the Macintosh name, the traditional Mac logo at start-up, nor an Apple for the DA menu.

Spindler said earlier that Apple insisted on restricting licenses to companies that spend money on research and development, to ensure that the Mac clone market will not offer just me-too machines.

Strickland explained that the first generation of Mac clones will be "Power Mac look-alikes," mimicking the current Power Mac architecture within PC boxes. Around the first quarter of 1996, he added, Mac clones will emerge that will feature stronger compatibility with other operating systems. Apple hopes that these "Windows-environment" Mac clones will increase the Mac OS market share within large businesses that have standardized on Windows computers but want to integrate Mac capabilities for certain departments.

Meanwhile, Apple would probably keep the PowerBook market; people would stick with true Apple PowerBooks because the integration issues are more complex.

The Mac now holds about 10 percent of the worldwide personal computer market, and Apple hopes to grow its Apple-branded Mac share to about 13 percent in the next three years, according to Strickland. He expects clone sales to add an additional 3 to 4 percent during that period, for a total Mac OS market share of 16 to 17 percent. Strickland said that any convergence between IBM's PowerPC Reference Platform (PREP) specification and the Power Mac would not occur soon. Such convergence could allow IBM PowerPC computers to run the Mac OS with no special modification (see "Glimpse of the Future," *Power Mac News*, September 1994). "It would take us about two years to port [the Mac OS] to PREP," Strickland noted. "It would require us to literally turn our software developer base over. We can't do that in the next two to three years."

Apple's new logo for the Mac Operating System will appear on clones at start-up and on boxes of Mac-compatible products.

Apple is pressing its suppliers to make Apple chips (ASICs and the like) available to clone makers at the same prices Apple pays. But such Apple-specific components would not be sold on the open market, Strickland added.

New Mac OS A year ago, Apple officials downplayed the similarities between Microsoft's upcoming Windows interface (Chicago) and the Mac's current interface. But now Apple has changed its tune. "Interfaces are too complicated," Spindler said, and he promised that Apple will beat today's other interfaces in offering a simple, compelling interface that will present users with a stark choice, as happened a decade ago when the first Mac challenged the then-dominant DOS interface. Spindler said the AppleSoft division will create this interface. That's a change in AppleSoft's original mission to develop unique apps for the Mac that would differentiate Macs from Windows PCs. That mission now falls to Apple's Claris subsidiary.

The new Mac OS will likely be released in early 1996. Code-named Copland, it will provide some of OS/2's and Chicago's technical capabilities, such as preemptive multitasking, that make system crashes less likely and allow better interoperability among programs in such schemes as OpenDoc and OLE. (OpenDoc will be made part of the Copland OS, although a System 7 version will ship in early 1995. Apple is banking on OpenDoc both to make multiplatform development easier and to hobble Microsoft. See "OpenDoc and OLE 2.0," elsewhere in this issue.) Apple would provide no interface details of Copland.

Users of Apple's now-defunct A/UX variant of Unix will have to wait until sometime in the first half of 1995 for the replacement version of Unix, called PowerOpen, that is based on IBM's recently completed AIX 4.1 Unix variant. PowerOpen will run only on Power Macs with a PCI bus, which should ship around the same time.

Video Future Spindler stressed the need to integrate video into the Mac. Separately, next-generation Power Mac product manager David Limp said the PCI-based Power Macs expected in spring 1995 would include AV technology and use Apple's DAV (Digital Audio Video) bus in addition to the PCI bus to provide high-quality video-capture, editing, and playback.

Spindler said that MPEG compression would be a key component of future AV technology, since it was a requirement of entertainment giants like Time Warner to use movies and other motion video in CD-ROMs and other media. In fact, Apple will ship an MPEG playback board for the Quadra 630 in time for the Christmas selling season, according to Carlos Montalvo, product-line manager for entry-level systems.

Apple officials pointed to the new Quadra 630 as an example of the video Mac of the future, one where even inexpensive Macs will deliver audiovisual processing power. Spindler pointed out that "multimedia is a key driving criterion" for the small-office and home-office markets, the fastest growing markets in the PC and Mac industries.

Spindler also explained Apple's interest in set-top boxes, devices under development by several companies to manage data, such as interac-

continues

In Brief

Online Ethics for Profit

Symantec has announced that it will give free copies of The Norton Utilities and Norton AntiVirus to the first 500 BBS sysops who post an approved code of ethics on their systems so that all normal users will see it in the normal course of use. Also, the sysop must agree that an approved code will remain as part of the sign-on process for at least four months. Contact the National Computer Ethics and Responsibilities Campaign on CompuServe for more information (GO CETHICS), or call 310/459-9565.

Storage Price Cuts

APS has cut prices by 5 percent to 35 percent on its entire SCSI storage line, including internal and external hard drives, removable hard drives, tape drives, and CD-ROM drives. Leading the price drop is APS's IBM 1GB internal hard drive, now selling for $699 ($799 external). 816/483-1600.

FolderBolt Pro

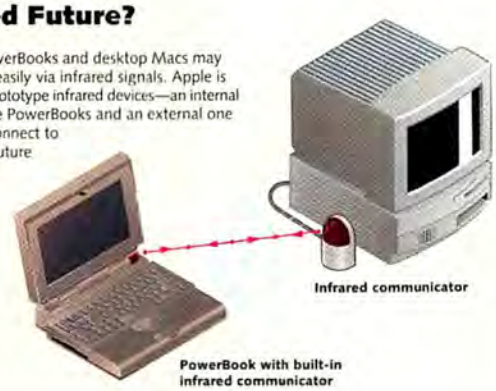
Kent Marsh plans to ship FolderBolt Pro for all current Macs by September at an expected $75 street price. The software supports using a password over a network to lock and unlock folders using personal file sharing or AppleShare. The program can also encrypt a file or folder while locking it. Upgrades from the 680X0 version 1.02c are free for copies purchased after January 1; other customers pay $39. 713/522-5625.

VideoShop 3.0

Avid Technology has released VideoShop 3.0, a video-editing program that includes Apple's new QuickTime 2.0. VideoShop 3.0 supports MIDI editing, which can substantially reduce the disk space required to store sound. Available now in a version for both 680X0 and PowerPC-based Macs, the program lists for $395; upgrades are $79. 508/640-3032.

Infrared Future?

Someday PowerBooks and desktop Macs may transfer files easily via infrared signals. Apple is working on prototype infrared devices—an internal one for future PowerBooks and an external one that would connect to current and future desktop Macs.



Artist's concept

tive TV. (Apple is involved in a set-top experiment in England.) While set-top boxes will not be profitable, Spindler sees them as an opportunity to sell more Macs. "A set-top is a Mac without the keyboard, monitor, and mouse. [After people buy a set-top box], we'll sell them these components, which have higher margins," he said.

PC Interoperability Elevated to a business strategy from a hotly debated experiment, DOS compatibility has become part of Apple's long-term strategy. The DOS Compatible board that Apple shipped for a few months this past spring sold well beyond expectations; plus early numbers show that nearly a third of Power Mac owners run Insignia Solutions' SoftWindows emulation software, according to Ian Diery, vice president of Apple's Personal Computer Division. Apple has shown a prototype PC coprocessor board for Power Macs that uses a faster processor and adds support for networking and SoundBlaster audio (which an Apple product manager conceded offers higher quality than standard Mac audio) for games and CD-ROMs.

Apple also promised that SoftWindows would be revised, perhaps by late December, to support Windows 3.1's 386 Enhanced Mode, which more and more Windows programs require and which will be needed to take advantage of Chicago. Spindler said that Enhanced Mode–compatible SoftWindows would be "critical" to the success of Mac clones, which users would want to be compatible with both the Mac and Windows.

Some future PowerPC-based PowerBooks will also include SoftWindows, while others may include a PC coprocessor card.

Connectivity Highlighted Scheduled for release before the end of the year is the long-awaited Telephony Tool extension, the component AV Macs need to handle voice mail and other voice communications along with faxing and E-mail. Spindler spoke of "the need to mask the complexity of E-mail, voice mail, and telecommunications," and he suggested this would be a main area of emphasis for the Mac.

Similarly, cross-platform networking was an important concern of Apple's, but one that Apple would rely on outside standards to supply. For example, Apple Business Systems vice president Jim Groff previewed native Mac Novell NetWare 4.1 server and client software running on a cross-platform network, and Groff said the Mac versions would ship shortly after Novell released 4.1 for PCs, scheduled for late this year or early next year. With System 7.5, Apple is also bundling MacTCP, which lets Macs connect to most Unix-based networks.

Relying on third-party technologies for enterprise-wide networking will let Apple focus on what Spindler called ad hocracy networks—those where users come and go and manage themselves, the hallmark of a department LocalTalk or ARA (Apple Remote Access) setup. AppleSearch 1.5 is due this fall, and Apple is working on ARA 3.0.

As promised a year ago, Apple is porting its networking software to PCs and planning to deliver Windows versions of its network software by the end of 1994. First out will be AppleShare and AppleTalk for Windows. Later will come AppleSearch, ARA, and PowerShare. Apple previously announced that it and Microsoft had agreed that Apple's PowerShare collaboration services would support Microsoft's MAPI (Messaging Application Program Interface) standard in a future release.

Apple will focus on Windows 3.1 rather than Chicago, according to Groff. Groff could not say whether Apple's ARA would work with Chicago's built-in remote-access software.

PowerBook Promises Rather than revise the PowerBook line every few months, as it has seemed to do in the last year, Apple will now develop notebooks with year-long life spans, according to Brodie Keast, vice president of the PowerBook division. When PowerPC-based PowerBooks ship in the first half of 1995, Apple will also provide PowerPC upgrades for all PowerBook 200– and 500– series notebooks. Till

TREND

Quad-Speed CD-ROM Drives

A HOST OF MECHANISMS

The CD-ROM drive market is a lot like New England weather—if you don't like it, you don't have to wait long before it changes. Quadruple-speed (600-KBps data-transfer rate) drives are starting to arrive on the scene; and NEC, Toshiba, and Plextor are leading the charge.

TOM GIESON

The Toshiba TXM-3501E (top) and Plextor's 4Plex are part of the new generation of quad-speed CD-ROM drives.

NEC announced its MultiSpin 4X Pro earlier this year and is now shipping the drive in quantity. The $995 drive features a 180ms average access time and a 256K cache. Plextor, the next to announce, sells both an external ($549) and a half-height, internal ($649) configuration. Plextor's drive, the 4Plex, has a larger cache (1MB), but a slower average access time (220ms). Toshiba's XM-3501B (internal, $470) and TXM-3501E (external, $600) drives sport a 256K cache and an average access time of 155ms.

As with the step from single- to double-speed drives, the 4X performance increase comes with some caveats. Speed increases are always useful for anyone who searches on and retrieves data from CD-ROMs; but if you're playing QuickTime movies, a 4X drive won't make that much difference, as most developers have optimized their content for playback on 150-KBps (single-speed) or more recently, 300-KBps (double-speed) drives. NEC, 708/860-9500; Plextor, 408/980-1838; Toshiba, 714/457-0777.—CAMERON CROTTY

then, the only change in the PowerBook lineup is the phasing out of the 230.

Future PowerBooks will include PCMCIA slots, a popular technology on PC notebooks that Keast admitted Apple had "missed out on." On PCs, PCMCIA cards are used to add everything from modems and hard drives to network support. Since Mac notebooks already include these capabilities, Keast said he expects PCMCIA to be used primarily to add wireless communications to PowerBooks. He also expects future Duos to have more built-in connectivity options and for Apple to simplify its docking options. One option is to revise the Mac OS to *hot-swap* cards and docking stations, which means users could insert and remove expansion options while the PowerBook was running. Chicago will add this to PC notebooks. Because as many as 15 percent of PowerBook owners use PCs, Apple is investigating whether to support Intel and Microsoft's Plug and Play specification, which should allow hot-swapping and automatic configuration of peripherals, so PowerBooks could connect directly to PCs.

Because about three-quarters of PowerBook owners also have a desktop computer, desktop connectivity is important to Apple. One option that Keast demonstrated in prototype form was infrared communication. He showed a PowerBook exchanging files with a desktop Mac that had an infrared pod plugged into a slot. Infrared technology, already available on the Newton MessagePad, might reduce the need for multiple ports and floppies on Duos while providing sufficient data exchange.—GALEN GRUMAN with CHARLES PILLER

MARK JOHANN

Hewlett-Packard's DeskWriter 540 converts from monochrome to color printing by swapping an ink cartridge.

HP Adds Ink-Jets

A SPRAY OF COLOR

Aiming to make it simpler to choose an inexpensive desktop printer for the home or small office, Hewlett-Packard has announced the DeskWriter 540, an ink-jet model that replaces two of the company's most popular ink-jet printers: the gray-scale DeskWriter 520 and the color DeskWriter 520C. With the introduction of the 540, HP will offer color as either an option or a standard feature on its entire DeskJet line. Users will easily be able to remove the black-ink cartridge that comes with the DeskWriter 540 and snap in an optional three-color cartridge. This will let users switch, for instance, from printing ordinary black-and-white business letters to getting out a color chart or party invitation. Hewlett-Packard says it sold two million color DeskJet/DeskWriter (the PC/Mac versions) printers in 1992, and it wanted to make color capability of some kind part of every ink-jet printer it sells. The one drawback to the three-color approach is that the printer combines cyan, magenta, and yellow to produce what's called *process black*); the resulting black is not as pure and dense as black ink, and the process lays down more ink in the black areas, making the paper cockle a bit more until completely dry.

Nonetheless, the prospect of buying a $365 printer that you can later upgrade to color for $49 is appealing. The first color cartridge is more expensive because it comes with a humidor, a case that keeps the ink from drying out. Later cartridges without the humidor are less expensive.

The DeskWriter 540 has 600-by-300-dpi resolution with HP's Resolution Enhancement Technology (RET). The 540 achieves 600-dpi horizontal resolution without performance cost because the print head now prints in both directions as it travels across the page. HP also improved the 540's paper handling: it accepts paper as small as 4 inches by 6 inches, and it takes stacks of envelopes. It prints 3 ppm for black and about 0.5 ppm in color. The printer also offers a speedier EconoFast mode with lower print quality. HP said that it has made its inks more water-fast (an issue for some, especially those who print envelopes) and that they are nontoxic, for home use.

Hewlett-Packard expected to begin shipping the DeskWriter 540 on October 6. It includes 512K of RAM, a faster processor, and 33 TrueType fonts. HP, 800/752-0900.—T.M

Apple Plans 3-D Chip

FASTER RENDERING FOR FUTURE MACS

Real-time rendering of 3-D images as you navigate and change perspective currently requires DSP chips to work smoothly, but Apple is working to miniaturize what now takes two NuBus cards into one chip that could be used on a motherboard or video card. Apple plans to

continues

In Brief

Ikegami's 21-inch Trinitron Clone

Ikegami Electronics USA plans to ship in September the CT-21B, a $2495 21-inch color monitor. The display uses Mitsubishi's Trinitron-clone technology with a 0.30mm aperture grille, and requires a $19.95 Mac cable adapter. Unique to the monitor are Apple-style 8-pin DIN serial ports, Apple ADB ports for use with special cables, and a set of front-panel dials that let you change the on-screen resolution. 619/280-0099.

OrangePC for Chicago

Orange Micro expects its existing PC coprocessor cards to support the forthcoming Windows 4.0 (known by its code name Chicago). A free software upgrade will likely be necessary, a spokesperson said. The OrangePC 200 Series coprocessor cards add a PC motherboard into any Mac with a 12-inch NuBus slot (all Macs with NuBus but the Quadra 610, Centris 610, and Power Mac 6100). Orange Micro may also add support for IBM's OS/2 2.1 operating system. 714/779-2772

Online Software

America Online, CompuServe, and Prodigy have upgraded their client software for Macintosh users. Expected to be available now, America Online 2.5 adds a redesigned interface, reorganized content, and the ability to view graphic images online. Due by October 1, CompuServe Information Manager 2.4 also includes reorganized content and the beginnings of a more graphical interface. Prodigy 2.0 has Mac-like menus at the top of the screen, and the software lets Macintosh users cut and paste and participate in live chats. This year Prodigy expects to ship the Mac version of the mail manager, which can receive Internet mail. Members can download the new software from the services when the new versions are available.

deliver "aggressive 3-D next year," according to president and CEO Michael Spindler. Apple has quietly demonstrated a 3-D interface that makes manipulating 3-D elements straightforward, and the company is developing a chip (for use in future motherboards or add-on cards) that would handle the intensive computations needed for 3-D work.

The company characterizes its demonstrations as research, not a commitment to a product. One of the driving forces behind the research is Apple's Advanced Technology Group, which has been at work on the 3-D interface, which uses shadows, sound, and visual clues to make manipulating and navigating 3-D objects easier.
—GALEN GRUMAN

Motion Works Multimedia Utilities

SIX-PACK OF SOFTWARE

Everyone needs tools to work with, and for anyone whose medium is multimedia, Motion Works has come out with a six-pack of software utilities designed for editing graphics, sound, and QuickTime movies.

The heart of the utility package is CameraMan 2.0, which records screen activity, including cursor motion and dialog boxes, to a QuickTime movie. QuickEdit is a multitrack version of the CameraMan movie editor; with it, users can add sound, titles, graphics, and additional video clips to their movies. For greater alterations, the Motion Works package includes QuickMorph, a mesh-based morphing utility; MotionPaint, a 24-bit cel-animation tool that supports overlaying and onion-skinning; and SoundMate, software that records, edits, and adds effects to 8- and 16-bit sound. Finally, with the MovieClick utility, users can add hot spots to their movies; hot spots execute various tasks when clicked, including going to a specific movie frame, playing a new movie, stopping playback, or playing a sound. The Multimedia Utilities are currently available for $299 from Motion Works, 415/541-9333.—CAMERON CROTTY

FWB Revs ToolKit Line

SPEEDING UP DRIVES

Aiming to make existing drives faster, FWB has come out with new versions of its Hard Disk ToolKit (now version 1.6), Hard Disk ToolKit Personal Edition (also 1.6), and CD-ROM ToolKit 1.1. The new CD-ROM ToolKit supports CD+G, which means you can view pictures that some recording companies are putting on audio CDs (including Fleetwood Mac's *Behind the Mask*).

Your CD-ROM drive also needs to support the CD+G format, and according to FWB, there are currently four or five models that do, including Apple's. You can tell if an audio CD has graphics on it by looking at the disc for the letters *CD+G* imprinted on the inner ring.

OK, fun stuff aside, CD-ROM ToolKit 1.1 also lets you extract a digital copy of music or other audio from a disc. That means the music does not have to be converted from digital to analog and back to digital to bring it into your AV Mac. Instead of going over an analog cable, the audio data goes through a SCSI cable in digital form. So you can get much higher quality playback without the data loss that would normally happen during the two conversions. Again, your drive must support audio extraction. Approximately 14 existing CD-ROM drives do, according to FWB, including the current Apple double-speed model and—surprise—the FWB HammerCD4X, a recently introduced quadruple-speed CD-ROM drive that uses a new Plextor mechanism (see "Quad-Speed CD-ROM Drives," in this section).

SCOTT PETERSON

FWB's HammerCD4X uses the Plextor quad-speed CD-ROM drive mechanism.

Not everyone needs the very high speed of the HammerCD4X, which carries a somewhat hefty list price of $1099. For those who do need a very fast source of data—for instance, to pour into a recordable CD-ROM drive without causing data hiccups—the extra price could easily be worth it. The drive also supports High Speed Multisession CD mounting and comes with a 1MB cache, the CD-ROM ToolKit 1.1 software, and cables. FWB sells CD-ROM ToolKit 1.1 separately for $79, or $29 for an upgrade from a previous version. The toolkit software also supports Apple's recently introduced QuickTime 2.0.

The company has begun shipping HardDrive ToolKit 1.6, the latest version of its disk-management utility software, which supports the larger 4GB maximum volume size permitted by System 7.5. Unfortunately, despite the recent appearance of more high-capacity drives and arrays, the maximum volume size will not go to one terabyte (1000GB) until Apple's next system software revision, which will not be out for quite a while.

Version 1.6 expands the formatting and other capabilities of earlier versions, and it works on more different brands and types of drives according to FWB. It lists for $199, and upgrades are $39. FWB also updated its less complex incarnation of the software, HardDrive ToolKit Personal Edition, to version 1.6. Personal Edition lists for $79, and updates are $29. These latter two products and the latest CD-ROM ToolKit also include native Power Mac versions. FWB, 415/474-8055.—T.M.

THE AMCOEX INDEX OF USED MAC PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	$600	–$50
PowerBook 140/4MB/40MB	$825	–$25
PowerBook 180/4MB/80MB	$1650	–$25
PowerBook Duo 230/4MB/80MB	$975	–$125
Mac Classic/2MB/40MB	$375	–$25
Mac SE/30/2MB/40MB	$600	$0
Mac LC II/4MB/40MB	$525	$0
Mac IIsi/3MB/40MB	$575	+$75
Mac IIci/4MB/80MB	$900	–$50
Mac IIfx/4MB/80MB	$1050	+$25
Centris 650/8MB/230MB	$1200	–$75
Quadra 900/8MB/160MB	$2100	+$100

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during the week of August 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

Now Charges Up Utilities

REVISES, ADDS COMPONENTS

Version 5.0 of Now Software's eponymous utilities package features two all-new components—Now QuickFiler and Now FolderMenus—along with several improvements to the bundle's regular lineup. Now QuickFiler complements the Mac Finder, combining enhanced file searching (including document contents) with compression technology borrowed from Now Compress. Portions of Now QuickFiler are written in native Power Mac code, as are pieces of Now WYSIWYG Menus and NowScrapbook.

With Now FolderMenus, when you click on a volume or folder's desktop icon, a hierarchical menu of the contents pops up, much like Inline Design's PopupFolder. Another work-saver is Now Startup Manager's new conflict-isolation feature. Similar to Casady & Greene's Conflict Catcher II, Now Startup Manager leads you through a test sequence, automatically activating and deactivating extensions until it finds the offending one.

Some enhancements to Now Utilities rely on parts of Apple's new System 7.5—with 7.5 and Now Menus installed, users can create custom, draggable menus in the menu bar for accessing files, folders, and applications. Custom menus support drag and drop: users can drag files from the desktop up to the customizable menus and drop them on compatible applications—launching both the file and the application. Also, Now Scrapbook and Now Profile are compatible with Apple's PowerTalk. Now Utilities 5.0 is currently available for an estimated street price of $89.95; upgrades are available for $39.95. Now Software, 503/274-2800.
—CAMERON CROTTY

BUGS & TURKEYS

Running Finale 3.01 with Virex 5.0 installed will freeze your Mac. Coda Music Software, the maker of Finale, has no fix planned; furthermore, the company says it can't be responsible for compatibility problems with non-Apple software in a user's System Folder. Now that's proprietary.

Prometheus's MaxFax 3.3.2, which comes with the company's fax modems, doesn't always work with 32-bit addressing active. If 32-bit addressing is active, some applications, including Microsoft Excel, may crash when users print or save. Prometheus hopes the problem will be fixed in version 3.5.1, expected by August.

Users of the Apple Multiple Scan 17 Display have reported problems getting resolutions other than 640 by 480 to appear on the display when used with a Quadra 605 or 650 equipped with 1MB of VRAM. Apple confirmed the bug, saying the problem lies with the Display Enabler 1.0. The company hopes to fix the problem in the next version of the enabler.

Apple boasts that its eWorld Apple Customer Center is "your direct connection to Apple Computer." But our determined digging unearthed only one response by Apple to the questions posted in its forum during a two-week period. And that response was to our question asking if Apple reads its boards. Apple says it is "continuing to work on setting up a permanent presence" on its own online service.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld*.

HP's First Color Laser

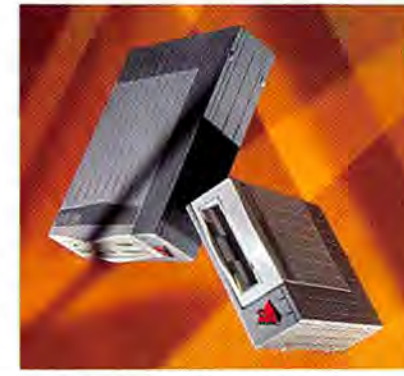
OFFICE COLOR SPREADING

It wouldn't be hard to envision Hewlett-Packard's motto as "Anything that prints." The HP Color LaserJet is the company's entry into the burgeoning office color-laser market recently occupied by QMS and Xerox. The Color LaserJet prints 300-dpi black-and-white images on plain paper up to 11 by 17 inches in size—color printing is limited to letter or A4-size paper. Print times range from roughly 2 ppm for four-color documents, through 4 to 5 ppm for black pages with a single highlight color, up to 10 ppm for black-only pages. The HP Color LaserJet ships with a parallel interface, but Macintosh users will likely want to add a JetDirect card for 10BaseT, Token Ring or Ethernet, and LocalTalk support ($369, $619, $429). PostScript Level 2 is also available as an option—in its standard configuration, the printer supports HP PCL 5. With the PostScript SIMM installed, the printer holds up to 56MB of RAM (ships with 8MB), and the PostScript upgrade adds 35 Type 1 fonts to the printer's 10 TrueType fonts and 35 Intellifont (Windows) typefaces. The HP Color LaserJet is currently available for $7295. HP, 800/752-0900.
—CAMERON CROTTY

DynaTek Storage

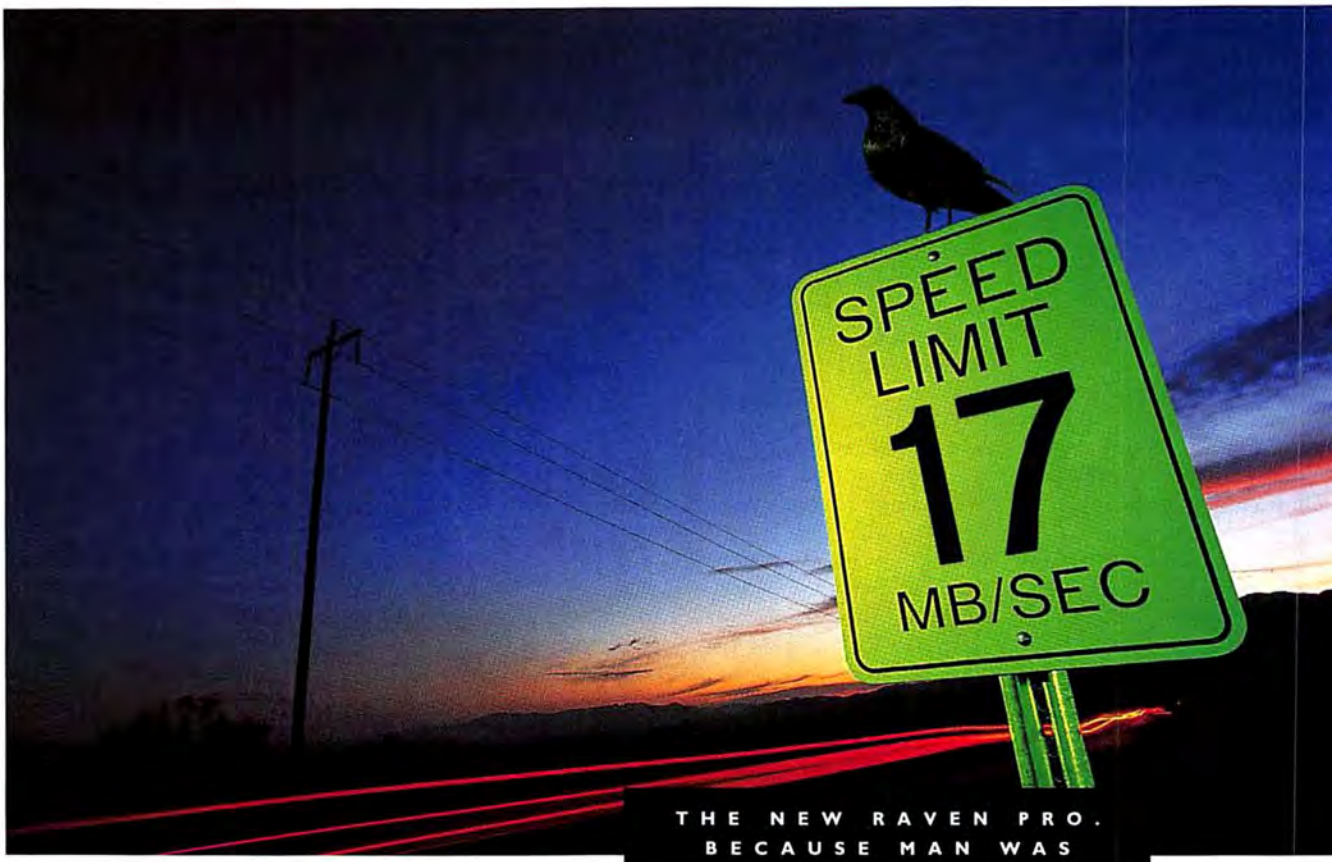
A MULTITUDE OF DRIVES

Another company has entered the storage fray: DynaTek, out of Nova Scotia, is offering a line of SCSI storage products. The company carries DAT tape drives, ranging from 2GB to 8GB ($1429 to $1714 standard retail price), and a full complement of SyQuest removable drives ($570 to $714). DynaTek also sells 128MB, 230MB, and 1.3GB optical drives, as well as double-speed CD-ROM drives based on Toshiba mechanisms ($464). Finally, DynaTek carries Quantum, SCSI-2–compatible hard drives ranging from 170MB to 1GB ($429 to $1257). All hard disk, optical, and CD-ROM drives ship with the company's ComPass Pro 3.0 SCSI-formatting and -utility software, and the DAT drives come with Dantz's Retrospect Remote backup software. DynaTek received an excellent tech-support rating in a recent article testing hard drive mechanisms between 120MB and 540MB (see "Mainstream Storage," March 1994). DynaTek, 902/832-3000.—CAMERON CROTTY



ROBERT PERRY

DynaTek's RMD200, a 200MB SyQuest removable cartridge drive (left); and ROS230, a 230MB erasable optical drive.



When it comes to performance, the sky should be the limit—not your equipment. Introducing the Raven Pro disk array, our next-generation flying machine. Now you can open a 480 MB Photoshop file with lightning speed. Transfer dailies without losing a single frame. Gain access to mirrored business-critical data in less than 8 ms or mix and match RAID levels and partitions to meet your specific needs. With 17.2 MB/sec throughput and up to 52 GB on-line capacity, they're four times faster and have 104 times the capacity of the native 500 MB drive you're probably using now. To find out what Raven Pro can do for your company's throughput, call 1-800-800-DISK. Then let your imagination and productivity take flight.

Raven Pro

Raven's flexible utility program allows you to optimize drive caching and each partition's parameters, including location on disk and block size for maximum application performance.

Raven Pro disk arrays offer a flexible upgrade path for all high-powered Macintosh systems via PDS, NuBus or software. PDS and NuBus versions provide a 32-bit data path via Fast/Wide SCSI-2.

MicroNet's Raven Pro is the newest addition to our family of award winning storage solutions. Based on proven Raven technology, it takes the science of disk array engineering to an unprecedented level.

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Circle 139 on reader service card

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Power Mac News

Fixing Power Mac Bugs

WHAT TO DO ABOUT WHAT DOESN'T WORK

DOUG ROSS

For most users, the path from 680X0 Macintosh to Power Macintosh is relatively painless. Migration is no more difficult than turning on the new computer, installing your software, and hooking the machine up to your network. But some users will encounter a few problems.

• The Power Mac randomly locks up with various 680X0 applications. According to Apple, under emulation some programs may require more RAM to run on the Power Mac, due to the differences in the memory-addressing scheme on the new models. The easiest solution is to give an application 25 to 50 percent more RAM via the Finder's Get Info function. If this doesn't work, try turning off the Modern Memory Manager option in the Memory control panel. (However, this trick could slow down native Power Mac software.)

• The Power Mac crashes or performs inconsistently with fax-modem software. All the major fax software has been updated to be fully compatible with the Power Mac line. Current software versions are Delrina FaxPro for Macintosh 1.5.1, Global Village TelePort 2.08b, Telefocus Faxstf 2.6.1 updater (for users of 2.X) or Faxstf 3.0.1 (for users of other versions), and PSI Faxcilitate 1.7. Both Faxstf and Faxcilitate are bundled with several fax modems.

• The Power Mac's internal video doesn't support monitors that sync on green (neither does the internal video in any AV Mac, Duo Dock, PowerBook, Quadra 605, or 040-based LC and Performa). The best solution is an adapter plug, such as the one offered by Griffin Communications (615/256-5794).

• Connectix's RAM Doubler does not load at start-up. You need to install version 1.5 (updaters are available from major online services) *and* you must turn off virtual memory.

• Apple's Power Macintosh Upgrade Card uses a different version of the PowerPC 601 CPU than the Power Macs do. The result is that certain classes of floating-point–math operations, such as exponential and logarithmic calculations (called transcendentals), will not be sped up. On AppleLink, Apple has released to developers a new version of its MathLib math libraries that may help.

• Apple's new System Update 3.0 has several fixes for the Power Macs (including 040-based Macs updated with Apple's PowerPC upgrade card). You can get a copy from any of the major online services or from Apple Customer Assistance at 800/767-2775.

• The recently released Berkeley Systems After Dark 3.0 and Adobe Systems Adobe Type Manager 3.8 address problems of slow performance on some scrolling operations.

• If you experience slow Power Mac network performance (especially on an Ethernet network), get Apple's Network Installer 1.4.5. You can find a copy on AppleLink, eWorld, or one of Apple's FTP sites. You can also order a copy from Apple Customer Assistance.—GENE STEINBERG

Shareware Goes Native

POWER MAC UTILITIES

The initially slow trickle of native commercial software was frustrating for many buyers of Power Macs. But overlooked in the wait is a steady stream of native shareware programs.

• Bill Goodman's classic $25 file-compression program, Compact Pro, is available as version 1.35p. True to native-software form, the new version requires more memory than does its predecessor (622K versus 504K).

• Another classic shareware program, Scott Berfield's $30 Mac Speedometer benchmarking tool, is also available in a version that includes native-mode tests.

• John Neil & Associates' $20 SoftwareFPU, which lets programs that rely on the 680X0 math coprocessor run on a Mac without such an FPU, is now available in a Power Mac version. To get it, users must download the 680X0 version from online services and send in their registration. Still, it's best to upgrade to a native Power Mac version of such FPU-requiring programs as soon as they are available.

• John Schack's $15 Correct Fractal Generator draws stunning, full-color fractal patterns.

• Dartmouth College's Fetch 2.1.2 lets Power Macs using the MacTCP networking extension navigate Internet databases.

• Chipmunk Basic is a freeware BASIC programming language by Ronald H. Nicholson, Jr.

• Greg's Browser 2.2 by Greg Landweber is a four-paned, Finder-neatening $20 shareware file manager; and Greg's Buttons 3.2, a $15 utility, colorizes and adds 3-D touches to common Mac interface elements.

• Enigma 2.4, a free file-encryption program by Mike Watson, now password-protects files at 100K per second.

All this software is available from America Online, eWorld, CompuServe, and the Internet.—DAVID POGUE

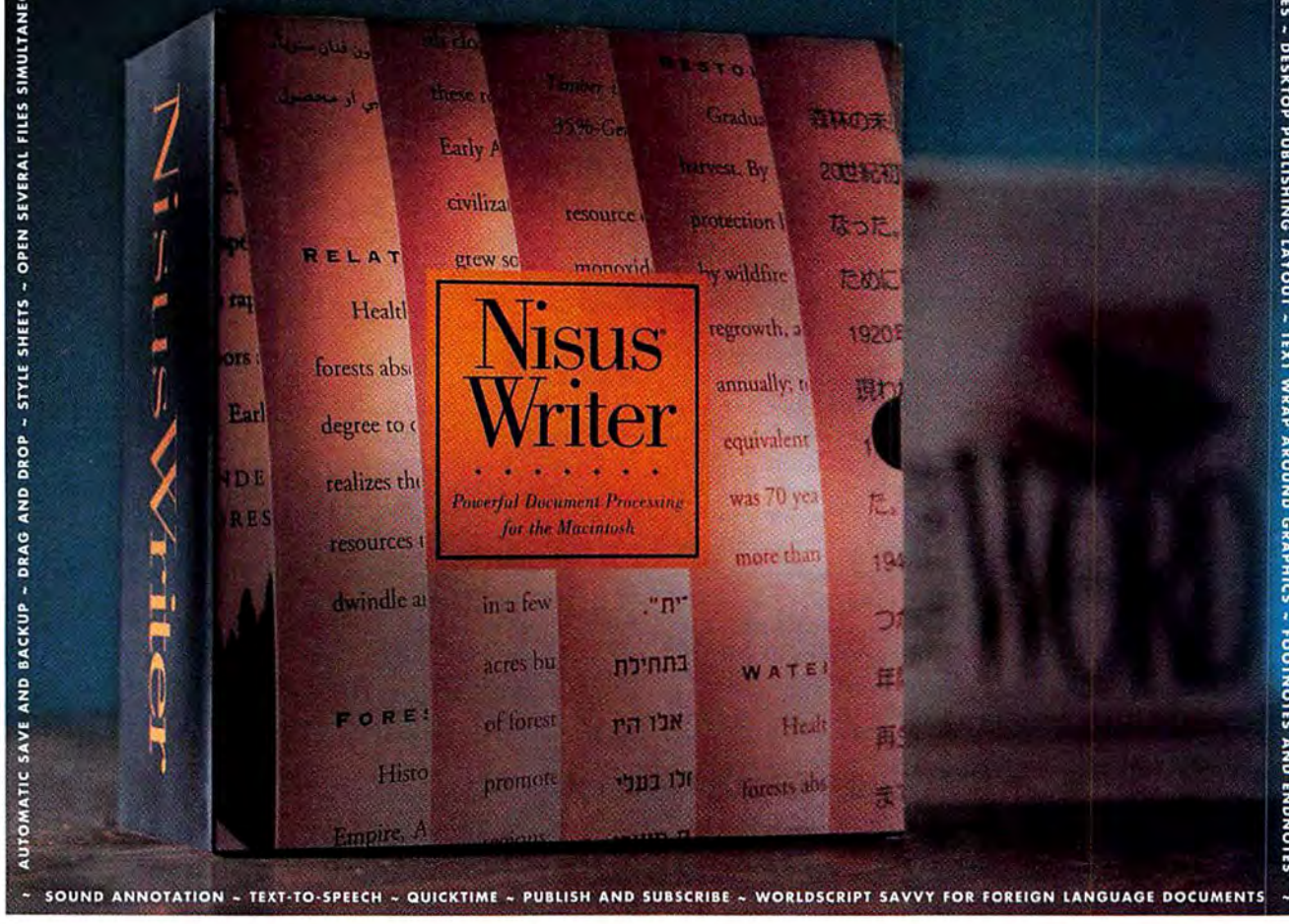
Speedometer 4.0 lets you compare Power Macs against other Macs.

~ UNLIMITED UNDOS AND REDOS ~ APPEND TO TEN EDITABLE CLIPBOARDS ~ NONCONTIGUOUS AND RECTANGULAR SELECTION ~ DOCUMENT LINKING

~ AUTOMATIC SAVE AND BACKUP ~ DRAG AND DROP ~ STYLE SHEETS ~ OPEN SEVERAL FILES SIMULTANEOUSLY ~ GLOSSARY ~ ONLINE AND BALLOON HELP

~ TABLES ~ EQUATIONS ~ SEARCH IN UNOPENED FILES ~ DESKTOP PUBLISHING LAYOUT ~ TEXT WRAP AROUND GRAPHICS ~ FOOTNOTES AND ENDNOTES ~

Think Of It As Microsoft Word In About 10 Years.



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Sure, Word's impressive. But it's no Nisus® Writer. By giving you the power to manipulate text in multimedia presentations, edit lengthy books, and create foreign language documents, Nisus Writer starts where ordinary Mac word processors stop. Of course, just because it's big on features doesn't mean it's big on memory requirements. At just 2 MB of RAM, Nisus Writer lets you spend less time waiting and more time writing. No wonder why critics are calling Nisus Writer the ultimate document processor. And why a lot of people are calling those other word processors yesterday's news.

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Circle 123 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY *MACWORLD*. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS WITH 1MB OF RAM, RUNNING SYSTEM 6. A ✪ SIGNIFIES THAT A NATIVE POWER MAC VERSION OF THE PRODUCT IS AVAILABLE. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY *MACWORLD*. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

ColorPoint 2 PSF Models 4 and 14

Siblings to the Professional ColorPoint 2, these 300-dpi thermal-wax-transfer printers support PostScript Level 2. The Model 4 prints letter-size (8½-by-11-inch) pages, and can process full-bleed pages in one minute. The Model 14 prints tabloid-size (11-by-17-inch) pages, and can produce a single, full-bleed page in 80 seconds. Both printers come with 39 resident Type 1 fonts; the Model 4 comes with 16MB of RAM, and the Model 14 with 32MB. The ColorPoint printers have LocalTalk, Centronics parallel, and RS-232 serial ports standard; and both models support an optional Ethernet adapter. Model 4 $5999; Model 14 $8999. Seiko Instruments USA, 408/922-5800, 800/888-0817; fax 408/922-5835.

JX-330

This 24-bit color flatbed scanner has an optical resolution of 600 dpi (interpolated resolution is 2400 dpi) and a scanning area of 8½ by 14 inches. The JX-330 comes bundled with Adobe Photoshop 3.0, and optional transparency adapters are available. $1500 (price not final at press time); transparency adapters $1100 to $1300. Sharp Electronics Corporation, 201/529-8200, 800/237-4277; fax 201/529-9636.

Mercury 4.2 GB Superfast Drive

If you've got a Mercury docking bay or a Mega Drive RAID array (MR/MK

Mercury 4.2 GB Superfast Drive

series) and an itch for more speed and more space, this 3.5-inch docking drive might be just the ticket. The 4.2 GB drive is based on the Seagate Barracuda mechanism and offers an 8ms average access time and sustained data throughput of up to 4 MBps. $3999. Mega Drive Systems, 310/247-0006; fax 310/247-8118.

Mirror 14-inch Trinitron Display

The name of this 14-inch, multiresolution color monitor tells the story. The Trinitron tube features a 0.26mm aperture pitch, and the monitor supports resolutions up to 640 by 480 pixels at vertical refresh rates up to 90Hz. $499. Mirror Technologies, 612/832-5622, 800/654-5294; fax 612/633-3136.

Mirror 14-inch Trinitron Display

Mirror 4GB and 9GB Hard Drives

The smaller of this pair of SCSI hard drives features an average access time of 8ms and a sustained data-transfer rate of up to 8.9 MBps. The larger of the two features an average access time of 11ms and a sustained data-transfer rate of up to 8.25 MBps. Both drives ship with cables, a terminator, and formatting and testing software. 4GB external $3529, internal $3469; 9GB external $4595, internal $4499. Mirror Technologies, 612/832-5622, 800/654-5294; fax 612/633-3136.

QuickCam

Remember to smile and watch the birdie when you use this black-and-white digital video camera to record your own QuickTime movies. The QuickCam records at up to 15 frames per second, has a built-in microphone, and plugs into the Macintosh's serial port. Basic recording/editing software is included, as well as a desk accessory that you can use to capture still images through the QuickCam. $149. Connectix Corp., 415/571-5100, 800/950-5880; fax 415/571-5195.

Series 2000 Snappable Hub

You'll be the center of attention when you install an Ethernet hub in your office. These stackable 10BaseT hubs come with 16 RJ-45 ports and 2 expansion ports; you can stack up to 10 Series 2000 hubs using UTP wire as a backbone. The hub is SNMP manageable over TCP/IP or Novell IPX, and an optional 17th port can be filled with a thick (AUI) or thin (BNC) Ethernet connector or an FOIRL link (fiber optic). $1295; AUI $250; BNC $275; FOIRL $325. NetWorth, 214/929-1700; fax 214/929-1720.

Spectra Com 28K-XL

Spectra Com 28K-XL

When 28.8 Kbps just isn't fast enough, this fax modem can also handle two-wire leased-line connections, and it features autodial backup and line restoration. On the more mundane side, the 28K-XL's data modem is compliant with the ITU-T speed and error-correction standards up to V.32bis and V.42bis. The unit includes a 14.4-Kbps send/receive Group III fax. $249. Bay Connection, 408/270-8070, 800/475-8329; fax 408/270-0698.

TelevEyes/Plus

You can use your television as a display with this hardware. Compatible with any Macintosh that can produce VGA video (Quadra, Centris, LC, PowerBook 160/180, and Duo with dock), the TelevEyes/Plus comes with software for controlling image underscan/overscan and position. The box also features a microphone input that lets you add audio to your productions and 3-watt output jacks for driving speakers at a presentation. $449.95. Digital Vision, 617/329-5400, 800/346-0090; fax 617/329-6286.

Troll Touch PB500

In the grand tradition of point-and-click, this touch screen mounts inside the case of your 500-series PowerBook (installation by manufacturer). The Troll Touch screen is pressure-sensitive, provides 4096 by 4096 points of resolution, and records up to 60 touches per second. Because the company uses resistive technology, a capped pen or gloved hand will work just as well as a bare finger. The screen draws power from and sends input to an ADB controller box, which mounts on the lid of the PowerBook. $695. Troll Technology, 805/295-0770; fax 805/295-0771.

SOFTWARE

Art Explorer

Aimed at kids (and adults) who have outgrown basic paint programs but who aren't yet ready for expensive, full-blown art software, this software package has common graphics tools, plus textures; gradient fills; special painting modes (dye, glaze, tint); and tools that mimic charcoal, airbrushes, and ink markers. Art Explorer also includes precooked backgrounds and clip art, as well as stencils to color in. 4MB min. memory; requires color, System 7, 13-inch monitor. $49.95. Aldus Consumer Division, 619/558-6000, 800/888-6293; fax 619/695-7902.

Art Explorer

CADMover 4

This vector-graphics translator can read the native file formats of more than 70 applications, including AutoCAD, Adobe Illustrator, Ray Dream Designer, and Canvas. CADMover also understands

continues

common exchange formats such as IGES, DXF, and EPSF. Version 4 includes a drawing previewer and support for ClarisCAD, MiniCad+ 4, Wavefront, Presenter Pro, and Envisage 3-D. $495. Kandu Software Corp., 703/532-0213; fax 703/533-0291.

CD AutoCache

If you're interested in increasing the performance of your CD-ROM drive but you don't want to spend hours tweaking packet and buffer sizes, this application-and-extension combination examines each CD and automatically adjusts the cache parameters depending on how the disc was mastered. The CD AutoCache package includes a mini-SCSI manager with full Logical Unit Number support, plus an Audio DA for listening to audio CDs. With the AutoCache software, users can also digitize CD audio to a hard drive. $79.95. CharisMac Engineering, 916/885-4420, 800/487-4420; fax 916/885-1410.

CD AutoCache

Crossword Wizard

Addiction is a terrible thing to witness, so we hesitate to tell you about this way to support your crossword-puzzle habit. Against our better judgment, we inform you that Crossword Wizard automatically generates puzzles, up to 21 squares across, from its database of words and clues. Our dedication to duty demands that we mention its multiple hint modes, its letter-by-letter word-builder function for finding obscure words, and the included Idea Wizard software that reveals how Crossword Wizard relates words and ideas together. 3MB min. memory. $49.95. Cogix Corp., 415/454-7217; fax 415/457-4089.

DesignReality

This surface-modeling tool features skinning, surface offsets, extrusions, sweeps, and patch surfaces. Users can punch holes through surfaces, create hull shapes, generate surfaces from a section, and generate a profile along a contour. You can duplicate an object or mirror it to create a reflection along any axis. Stretch and mold tools let you dynamically alter geometric configurations. You can define multiple light sources and positions, plus assign a name and color to any object. Panoramic viewing lets you view a design from any location. DesignReality imports DXF, EPS, and Vellum files; it exports to Vellum, IGES, and DXF 3D, among others. 16MB min. memory; requires Mac IIci, math coprocessor, 8-bit color, System 7.1. $1995. Ashlar, 408/746-1800, 800/877-2745; fax 408/746-0749.

Dramatica

This tool can help you create blueprints for your stories, making sure that all the elements of character, plot, and theme are in place, and keeping track of these central threads through revisions. Dramatica starts with a query system; as a story develops, the software's story engine helps keep the important elements in sync and relates them to the overall structure of the story. Dramatica also includes character-building tools to help writers develop and flesh out characters with motivations and purposes. 4MB min. memory; requires System 7.1. $399. Screenplay Systems, 818/843-6557; fax 818/843-8364.

Dramatica

Flying Colors

This color painting program provides three levels of interface. You can hide all but the simplest tools for easy use by small children; reveal most of the tools and features for more advanced users; or run at the top level, with features like opacity control and masking. Flying Colors includes most common paint tools, and comes with backgrounds, image stamps, and clip art for younger users. 4MB min. memory; requires 8-bit color. $40 estimated street price. Davidson & Associates, 310/793-0600, 800/545-7677; fax 310/793-0601.

FolderBolt Pro

Linus had a security blanket, but warm and fuzzy is not going to keep your files safe from prying eyes. This program locks and optionally encrypts files, folders, and entire volumes. This latest, native Power Mac version increases the speed of both DES and FolderBolt's proprietary encryption feature. The Incinerate (data-shredding) and EasyTrash (⌘-key–based file-trashing) functions have also been accelerated, and FolderBolt Pro can now interpret and unlock files locked with the Windows version of FolderBolt. $129.95. Kent Marsh, 713/522-5625, 800/325-3587; fax 713/522-8965.

Glider Pro

Return with us now to the air currents of yesterday. If you are a paper-airplane jockey, check out the new version of this "flight simulator." Your glider now flies over meadows and rooftops, pops in and out of mailboxes, and ventures underground, while you search for the Magic Star Wand. Two players can fly Glider Pro simultaneously, either working together or competing for the collectibles in each scene. Requires System 7. $49.95. Casady & Greene, 408/484-9228, 800/359-4920; fax 408/484-9218.

continues

Even though PowerBooks are portable, they aren't always convenient. Batteries die, data gets lost or stolen, and controlling the cursor is, well, a curse.

Connectix PowerBook Utilities™ (CPU) solves these problems and makes your PowerBook a real pleasure to use.

A PowerBook with CPU installed:
- Extends your battery life
- Displays accurate battery status
- Allows keyboard shortcuts for menus and dialogs
- Protects your files
- Instantly sleeps and wakes
- Saves your LCD screen when inactive
- Keeps the cursor visible
- And has over a dozen other enhancements.

CPU is the award-winning, number one selling PowerBook utility. And now CPU works with all the new '040 PowerBooks.

Order CPU from your favorite dealer or call us at (800) 950-5880 toll-free today.

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Circle 189 on reader service card

The Resolution Revolution

1800 DPI

Introducing the new Unity™ 1800XL-o Plain-Paper Typesetter. Once again, LaserMaster® leads the industry and breaks another resolution barrier with 1800x1800 TurboRes!® The Unity 1800XL-o offers the highest-quality camera-ready output available on plain paper. It prints fine lines, flawless text, incredibly smooth halftones and screens, and offers the convenience of oversized typesetting.

TURBORES® FAST • LOW COST • RECYCLABLE TYPESETTING

Cost-Effective Camera-Ready Output

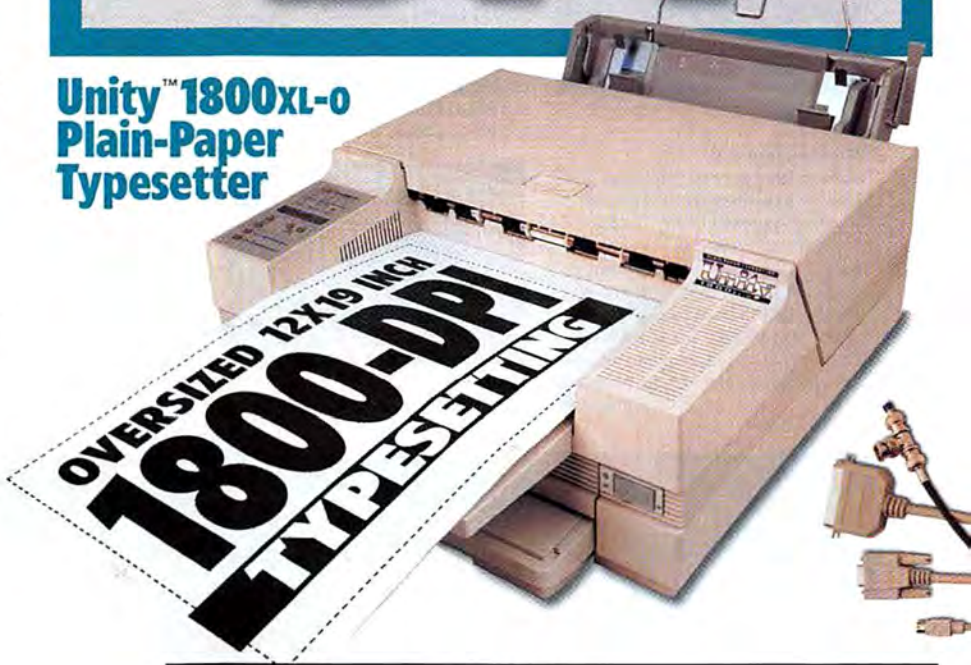
With the Unity 1800XL-o you get camera-ready output from your desktop for only pennies a page. It saves in-house groups both time and money by providing complete camera-ready pages that can be handed off to the print shop. And if you provide plain-paper typesetting as a service, the Unity 1800XL-o eliminates many of the steps involved in the pre-press process.

Oversized Typesetting

With the Unity 1800XL-o you'll never have to hassle with keylining, stripping, or tiling again! Its 12"x19.5" paper support allows you to print 11"x17" documents with full bleeds, crop marks, and registration marks. With oversized printing and camera-ready 1800-dpi output, you can easily take projects from concept to completion.

For More Information

The Unity 1800XL-o—the industry's new pinnacle of quality. Don't settle for less! Call now for more information and some sample output.



Features:	Benefits:
Oversized Typesetting	Up to 12x19.5-inch pages allow for full bleeds with crop and registration marks—eliminates paste-up.
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Multi-Platform/Networking	Mac, PC, and Unix users can all attach to the same printer.
235 Premium Type 1 Typefaces Pre-Installed	Provides high-quality typographic flexibility.
ClearCopy™ Copier Enhancement	Ensures halftones look crisp and clear after photocopying.
66-MHz Processor	Processes print jobs fast.
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Multi-platform, camera-ready 1800-dpi output, 11"x17" paper support (upgradable to oversized), and 135 pre-installed typefaces.

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Launch Pad
You want to turn your kids loose on your Mac but you fear they'll nuke your files or scramble your settings. Launch Pad provides kids with a friendly desktop of their own and keeps their files and settings separate from yours. From behind the dashboard of an imaginary rocket car, kids can use applications that parents have approved. A graphic backdrop displays one of six worlds filled with animations and sounds. The interface also includes a talking calculator and clock. Expected street price $30. Berkeley Systems, 510/ 540-5535, 800/344-5541; fax 510/ 540-5115.

Launch Pad

MacEmulate 3.0
Sad though it may be, not every platform has a GUI interface, and sometimes you have to connect to one that doesn't. This terminal-emulation software supports 132 columns; multipage memory; programmable function keys; and over 15 terminal-emulation modes, including VT100 and VT220. The latest version (3.0) of MacEmulate supports Apple's Comm Toolbox and includes Xmodem and text-transfer tools. $199. Cornerstone Data Systems, 714/772-5527; fax 714/772-2838.

MacLinkPlus/HP Palmtop
If you keep your addresses, numbers, or recipes in an HP Palmtop, you can transfer your data to and from your Macintosh. This package includes data-transfer and -translation software; you can import and export files in Dynodex, Address Book Plus, FileMaker Pro, Excel, and other formats. MacLinkPlus/HP Palmtop includes a serial cable kit. $129. DataViz, 203/268-0030, 800/733-0030; fax 203/268-4345.

Marathon
The aliens are at it again. You, as the science officer of a deep-space colony ship, are the last line of defense against hostile and intelligent intergalactic troublemakers. Fortunately for the human race, you've got awe-inspiring, futuristic weaponry and you know how to use it. This 3-D, texture-mapped, action-adventure game features dynamic lighting effects and stereo sound. 3MB min. memory; requires 8-bit color. $69.99.

Marathon

Bungie Software Products, 312/563-6200; fax 312/563-0545.

Network Troubleshooting Starter Kits
Based on the AG Group's EtherPeek and LocalPeek packet-level network-analysis programs, these kits combine tools, training, and reference materials into a single package. In addition to the network analyzers, the packages each include two instructional videotapes, a reference textbook, and several network-management utilities. LocalTalk $795; Ethernet $1095. AG Group, 510/937-7900, 800/466-2447; fax 510/937-2479.

Nok Nok
Recently acquired and updated by the AG Group, Nok Nok is a control panel that notifies you when an outsider connects to your machine; Nok Nok logs the name of the visitor, even if he or she is attempting to log on anonymously as a guest. Version 2.0 has sliding controls with which the host user can set how much CPU time will be dedicated to file-sharing tasks. Also, the utility can automatically open the File Sharing Monitor when a visitor logs on and close it when all visitors have left, and if Apple's text-to-speech software is installed, Nok Nok will announce a visitor by name. $50. AG Group, 510/937-7900, 800/466-2447; fax 510/937-2479.

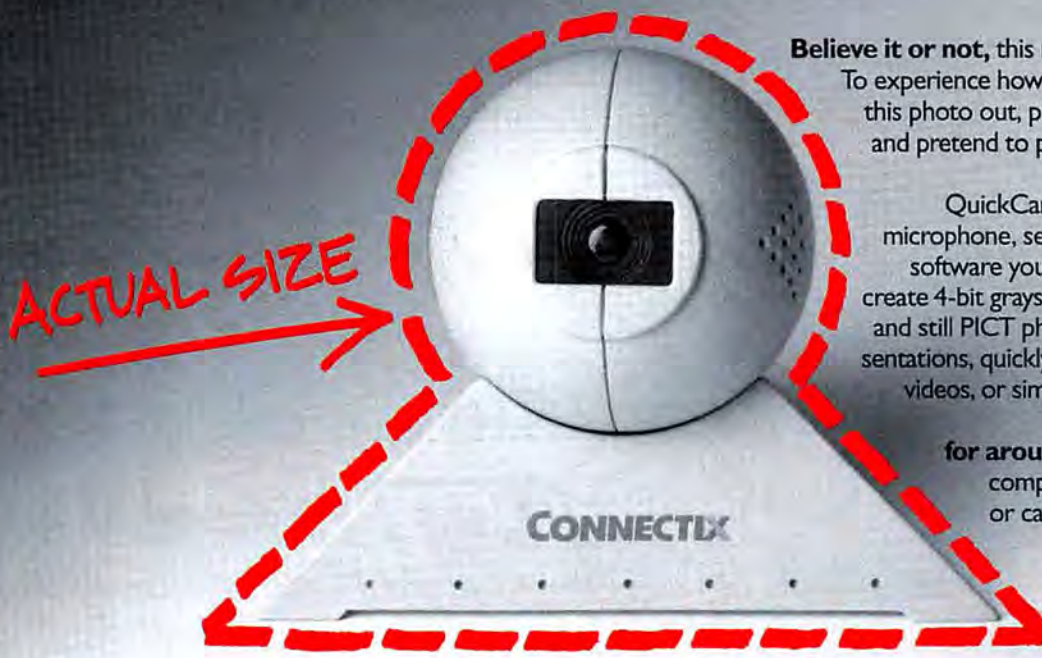
PageMaker 5.0 Enhancement Pack Volume 1 for Macintosh
The package of utilities includes the QuarkXPress Converter, which translates XPress documents into native PageMaker 5.0 format. The software maintains XPress text attributes, style sheets, TIFF and EPS formats, and image links. $9.95. Aldus Corp., 206/622-5500, 800/628-2320; fax 206/628-5737.

PageTools
Software is never perfect—fortunately, you can easily add utilities to programs like PageMaker. This package is a set of ten PageMaker utilities that add everything from a customizable menu bar of functions to expanded object-alignment and -distribution options. Elements of PageTools offer enhanced object-color manipulation; file-previewing capability; single-click guide creation; and extra floating rulers that operate independently of a document's anchored rulers. Requires PageMaker 5.0. $129. Extensis Corp., 503/274-2020; fax 503/274-0530.

ResumeMaker for Macintosh with Career Planning
There is plenty of software that can help you when you're on the job, but what about when you don't have a job? ResumeMaker helps users create résumés and job-hunting correspondence, including cover letters and thank-you letters. In the Prospects section of the program, users can log information about their job leads, target companies, and contacts. The latest version of ResumeMaker features extra career guidance and job-search techniques in

continues

Introducing the **coolest**, least expensive video camera for the Mac.
Rehearse with this until you get your own QuickCam.



Believe it or not, this really is a video camera. To experience how easy QuickCam™ is, cut this photo out, place atop most any Mac and pretend to plug into the serial port. **That's it.**

QuickCam comes with a built-in microphone, separate base, and all the software you'll need to immediately create 4-bit grayscale QuickTime movies and still PICT photos. Jazz up your presentations, quickly prototype multimedia videos, or simply amaze your friends.

Pick up QuickCam for around $100 wherever fine computer products are sold or call us at (800) 950-5880 x501 toll-free **today.**

QUICKCAM

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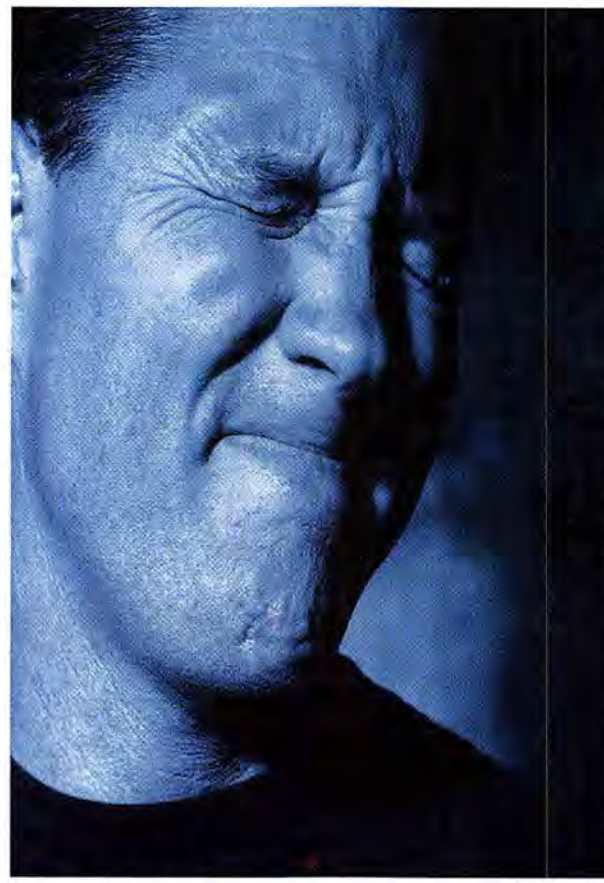
IT'S GONE. AND YOU DIDN'T BACK IT UP.

FACE IT. YOU NEED to back up your files. Use Retrospect, the number one Macintosh backup software — backing up over one million Macs, at last count.

Dragging important files to floppy disks is not backing up. If you crash you'll be retyping and trying to recover files for days. And then still searching for what's missing months later. And what if there's a fire, theft, flood, or equipment breakdown?

dantz



With Retrospect from Dantz you'll be backing up to the storage device of your choice in seconds — including SyQuest, Optical, Bernoulli, floppies, and file servers. And just about any Macintosh tape drive you choose.

Retrospect packs more power than all the others put together.

AUTOMATIC OPERATION. Simply point and click to create a script, then schedule it to run days, nights, or weekends.

WORLD CLASS RESTORING. Every preference file, document, application, control panel, extension and font is returned to its exact location. You won't miss a beat.

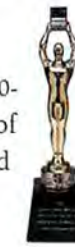
SECURITY. Retrospect has security covered, with full password protection at every entry point. Even encrypt data passed over the network to prevent snooping.

SPEED. Retrospect's customized drivers and interleaved data flow operate SCSI storage devices 20%-100% faster than any other backup software — guaranteed.

Accelerated for Power Macintosh

COMPRESSION. Retrospect's built-in Lessr™ compression cuts backups down to size without compromising performance.

NETWORK OPERATION. Back up a network of Macintoshes as easily as you back up one. Just install a Remote INIT (available in Remote 10- or 50-Packs) on each of your networked Macintoshes and include them in your backup scripts.



TOP INDUSTRY AWARDS. Don't just take our word for it. Listen to what experts say about Retrospect: "Retrospect has no equal." *MacWeek*, Diamond Award. "For backing up and archiving, there's nothing better." *Macworld*. And Retrospect Remote is a *MacUser* 1993 Editor's Choice Award winner.

The price for peace of mind? Well under $200 — backed by a 30 day money back guarantee. Don't be caught off guard when disaster strikes, call your local dealer today.

Dantz Development Corp., 4 Orinda Way, Building C, Orinda CA 94563 (510)253-3000.

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STRATA

MacUser 5 stars

MW EDITORS' CHOICE

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the form of Richard Nelson Bolles' New Quick Job-Hunting Map, which is drawn from his book, *What Color Is Your Parachute?* $49.95. Individual Software, 510/734-6767, 800/ 822-3522; fax 510/734-8337.

Wolfenstein 3D

One of the hottest action/arcade titles for the PC is appearing on the Macintosh. Captured by Nazis, you must find the plans for Operation Eisenfaust and escape from the prison keep, Wolfenstein. You'll rely on your wits and whatever weapons you can find in this fast-paced first-person adventure. Wolfenstein 3D ships in both Power Mac and 680X0 versions. 2.5MB min. memory; requires 8-bit color. $49.95. MacPlay, 714/553-3522, 800/736-5738; fax 714/252-2820.

World of Words

You can never be too rich, too beautiful, or too educated. This vocabulary-improvement software is aimed at high school students studying for their SATs. World of Words is based on a teenager named Luther, who sprinkles stories and illustrations about his favorite bands with vocabulary words culled from previous SATs. Students can hear the words read aloud, words are linked with distinct images, and words are grouped into Word Families, creating a structure of relationships between words. $69.95. Randolph Educational Services, 201/328-1512; fax 201/328-2893.

CD-ROMS

Buried in Time

In this sequel to The Journeyman Project, you'll once again become Temporal Security Agent #5, the time-traveling law-enforcement officer. When you discover that you've been framed for alter-

Buried in Time

ing history, you must travel to past and future worlds and solve complex puzzles in order to prove your innocence. Buried in Time combines rendered images, video, and animation with a stereo sound track to bring your quest to life. 8MB min. memory; requires color Mac, double-speed CD-ROM drive, System 7. $79.95. Sanctuary Woods Multimedia Corp., 415/578-6340, 800/665-2544; fax 415/578-6344.

Corel Gallery for the Macintosh

This disc contains more than 10,000 clip-art images in PICT format; 6000 of the images are in color, and the product includes browsing/selection software. The Gallery package also includes the Corel Professional Photo Sampler Disc, which contains 100 stock photographs in Photo CD format. $59. Corel Corp., 613/728-8200, 800/836-3729; fax 613/728-9790.

Doctors Book of Home Remedies

Everyone needs a physician at some point, but this disc provides preventive health-care tips and advice. The product includes a database of over 2000 practical cures; 25 minutes of video; and health-related tips and techniques, such as 29 tips for dealing with the common cold and 27 ways to reduce cholesterol. The Doctors Book of Home Remedies also includes toll-free listings of support and treatment agencies and an interactive personal checkup based on a user's personal data and habits. $39.95. Compton's NewMedia, 619/929-2500, 800/862-2206; fax 619/929-2600.

Dracula Unleashed

It's several years after Count Dracula took a stake through the heart in Bram Stoker's original novel, but he's managed to inhabit another body, and it's your job to find out whose. This adventure game uses 96 minutes of video to create 135 scenes through which you must navigate. Every choice affects your path, and there is more than one way to end this story. 2.5MB min. memory; requires Mac LC, 8-bit color. $59.95 street price. Viacom New Media, 212/258-6000, 800/469-2539; no fax.

ImageVault Pro

This four-disc set contains over 380 royalty-free, model-released stock photos. The package includes access software—you can browse images and export them in PICT, TIFF, TIFF-YCC, or EPS format. All images come in 300 dpi, in five sizes: wallet (128 by 192 pixels), snapshot (256 by 384), standard (512 by 768), large (1024 by 1536), and poster (2048 by 3072). 4MB min. memory; requires 8-bit color. $349. American Databankers Association, 918/742-2022, 800/775-4232; fax 918/742-8176.

Shoot Video Like a Pro

Anyone can create video with a camcorder, but making it look good is another matter entirely—this disc contains a set of tutorials on sound, light, and shot composition. In each lesson, you get to experiment with the lights, microphones, and camera position on an imaginary shoot. The tutorials include specific advice from video professionals on how to get the results you want. $59.95. Zelos Interactive Media Publishers, 415/788-0566; fax 415/788-0562.

Weatherstock Weather Photo-CD

You can't beat mother nature for images of beauty, power, and sheer destruction—this disc has 100, 24-bit images of everything from lightning and tornadoes to moonrises and puffy clouds. All images are in Photo CD format. $99. Weatherstock, 602/751-9964; fax 602/751-1185.

Weatherstock Weather Photo-CD

ACCESSORIES

NoteBook Traveler Leather Carrier

If you've always wanted to wrap your PowerBook in black leather, this may be your chance. This carrying case is about the size of a double-wide briefcase and can accommodate a PowerBook and a portable printer, as well as business cards, magazines, papers, pens, power supplies, disk drives, floppies, a cellular phone, and many of the other amenities-cum-albatrosses of the modern mobile executive. $265.95. Kensington Microware, 415/572-2700, 800/535-4242; fax 415/572-9675.

Notebook Traveler Leather Carrier

PowerAssist

Scratch a PowerBook user and you will find a ravening beast, hungry for both power and tiny accessories. PowerAssist is an AC adapter for 100-series PowerBooks that is roughly one-third the size of Apple's power adapter. The PowerAssist will merely extend the life of your battery by four times while you are plugged in and working; when you put your PowerBook to sleep, PowerAssist will charge your PowerBook battery. $69. Newer Technology, 316/685-4904, 800/678-3726; fax 316/685-9368.

Red Guard

It never fails—just as you're about to finish that five-hour download, someone picks up an extension phone and dusts your connection. You'll never have that trouble again if you add a Red Guard device wherever you have a phone extension. The compact module locks extensions out of the circuit while your modem or fax machine is in use. Package of three $29.95. ORA Electronics, 818/772-2700; fax 818/718-8626.

SCSI PowerPlug

Some people's idea of a removable hard drive is when you unplug the drive from the SCSI chain and trot it over to another workstation. The SCSI PowerPlug lets you add and remove devices to and from a SCSI chain without turning off your Macintosh. $79.99. ADCON Corp., 203/761-0651; fax 203/761-1444.

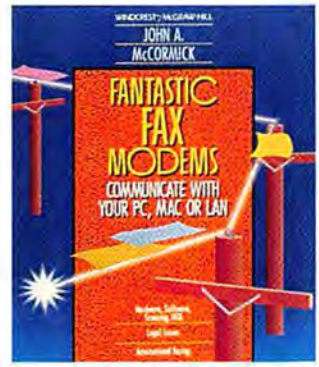
SCSI Switch/Extender

With this device you can connect two Macintoshes (or a Mac and a PC) to the same SCSI chain. The box has two inputs and one output—switching is controlled via a rocker switch on the front panel—and the device checks to make sure that the SCSI bus is quiet (no data is being passed) before switching from one line to another. Also users can extend their SCSI cable runs up to about 20 feet. Desktop $495; rack-mount $595. Glyph Technologies, 607/275-0345; fax 607/275-9464.

BOOKS

Fantastic Fax Modems

Fax modems are easy to buy but not so easy to use. Author John McCormick teaches you how to buy both Mac and PC fax modems and software, and then how to get the most out of your purchases. The book covers troubleshooting, image and color transmissions, overseas faxing, converting faxes to text files, and faxing from the road. 240 pages. $21.95. Windcrest/McGraw-Hill, 717/794-2191, 800/822-8158; fax 717/794-2080.



Fantastic Fax Modems

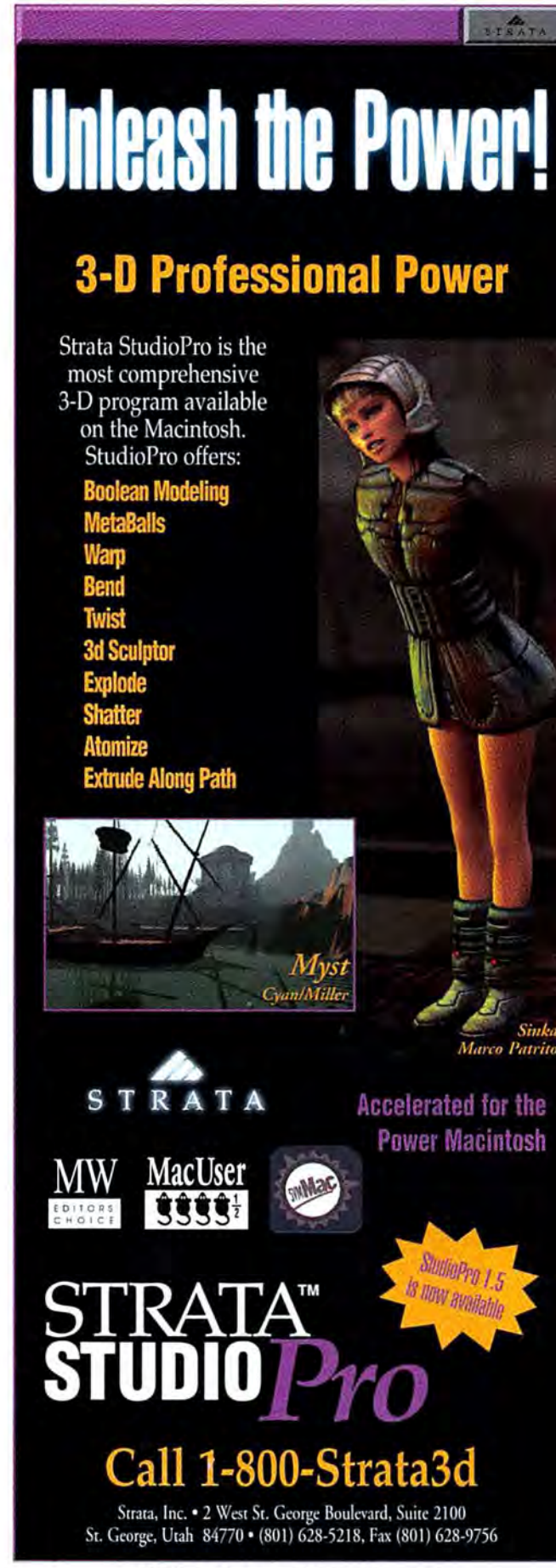
Macromedia Director Design Guide

You can produce sophisticated multimedia presentations with your Mac—if you know what you're doing. This book contains tips and techniques for designing interactive multimedia with Macromedia Director. Written by Lee Swearingen and Cathy Clarke, the book includes a CD-ROM with example projects, tools, and clip media, as well as a working version of Macromedia Director 4 with only the save function disabled. 198 pages. $29.99. Hayden Books, 317/581-3500, 800/428-5331; fax 317/581-3550.

Newsletters from the Desktop

Professional designers know how to complement editorial content—that's their job. But if you're publishing a newsletter, you might not be a professional. You might like to know about newsletter building blocks, templates, prototypes, and getting professional pizzazz on a pizza budget. Authors Joe Grossmann and David Doty cover everything from choosing a headline type, to using a service bureau, to preparing for the printer. 350 pages. $24.95. Ventana Press, 919/942-0220, 800/743-5369; fax 919/942-1140. m

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94017. *Macworld* reserves the right to edit all product announcements.



Circle 116 on reader service card

There is nothing like the feeling of losing your data. There is nothing like booting up to find that your twenty-page conference report has burned to a crisp. Or watching a month's worth of virus-infected spreadsheets go up in smoke right before your eyes.

When it happens, a rush of job-security panic begins in your legs and rapidly bolts all the way up to your cerebellum. And the impact of losing all of your hard work affects you in a way you'll certainly never forget.

Data loss. It's one fiery disaster that makes for an awfully bad day.

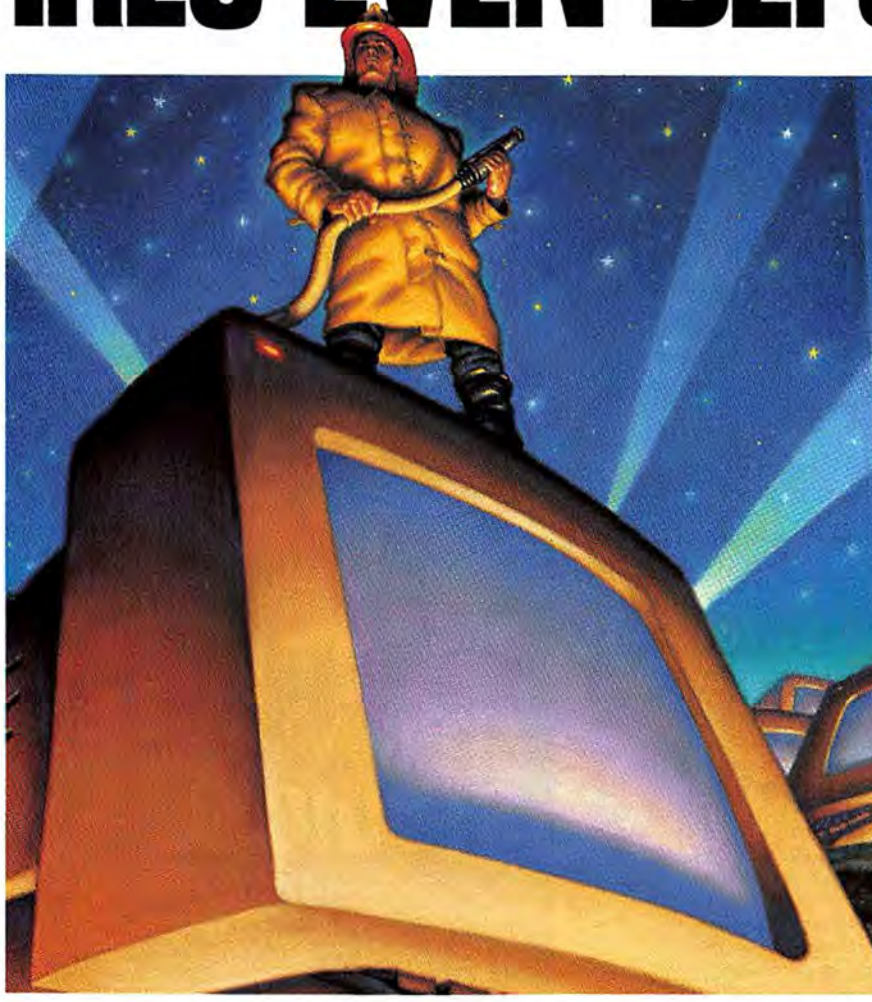
Proactive Protection For Your Macintosh.

This being the way things are, at Symantec we subscribe to the theory that the best way to deal with a disaster is, well, to prevent it in the first place. Which is the very reason for our newly updated Norton Utilities® and SAM.® In a word, they're proactive. But to put it more poetically, this improved data-protection software actually snuffs out fires without so much as the stirring of your mouse.

New Norton Utilities Detects Damage Before Disasters Happen.

For starters, look at our new Norton Utilities 3.0. We've taken the industry's most powerful data recovery and repair program and improved it to where it's almost invisible. So that now you can virtually load it and forget it.

NEW NORTON AND FIRES EVEN BEFORE YOU



The new versions of Norton Utilities and SAM provide proactive protection. Kind of like little firemen running around behind the scenes stamping out fires before they can ever start. So, even if it could've been a ten alarmer, you'll never hear a thing.

The enhanced Filesaver feature proactively and consistently works to maintain your system at premium health by scanning in the background for early signs of trouble. This new agent-oriented technology is a Norton exclusive that personally reminds you when it's time to do basic data maintenance such as backing up or optimizing. In terms you can easily understand. It also automatically monitors your data for up to 500 deleted files so they can be easily recovered.

Once a problem has been detected, Norton Disk Doctor takes over. Improved Disk Doctor recommends a solution and then executes it on your command. It now hunts down, diagnoses, and repairs problems in more areas of the disk than any other software.

* Prices may vary. Shipping, handling and tax extra. This offer not good with other promotional offers. Resellers not eligible. Offer expires 12/31/94. Symantec, Norton Utilities and SAM are U.S.

The enhanced Speed Disk's unique customization feature lets you defragment everything from a whole volume to a selected file.

And Norton Utilities 3.0 now also includes enhanced backup. Which creates self-extracting and self-restoring backups of your data.

This improved capability makes it even easier for you to restore data during emergency situations. And our backup now also supports tape drives.

Peter Norton has always been well ahead of the pack when it comes to desktop data recovery and antivirus protection software.

greatest level of protection against new viruses as they are discovered.

The new SAM also scans for and destroys viruses in more types of compressed files than any other antivirus software can. SAM covers DiskDoubler, Compact Pro, StuffIt, and Now Compress. This ensures your ability to detect and eliminate a virus in any compressed file.

And for all of you who have a healthy appreciation for speed, the means accelerated scanning speed, greater productivity, along with even more transparent protection.

What it shakes out into is that improved Norton 3.0 and SAM 4.0 now provide your Mac with the ultimate available levels of proactive protection against data loss. It's all rather amazing.

Then again, maybe all of these advancements are not so amazing. After all, Symantec is, of course, the proven industry leader when it comes to Mac data repair and recovery and virus protection.

SAM. THEY PUT OUT CAN SMELL THE SMOKE.

NEW SAM PROVIDES THE BEST PROTECTION AGAINST VIRUSES.

However, that's just the half of this proactive pair. We've also fully redesigned SAM 4.0 to provide the most complete and most effective virus protection, detection, and elimination of known and unknown viruses. So that what could turn your entire system into a towering inferno never even becomes a spark.

Accelerated for Power Macintosh

Norton and SAM are accelerated for Power Mac, letting users take full advantage of the speed capability this technology provides.

One of SAM's exclusive features is automatic virus updating. Through your modem, SAM automatically dials the Symantec BBS daily, weekly, or according to any schedule you tell it to follow.

It then downloads the latest virus antidotes and updates your virus definition files. So you now no longer have to mess with manual updating. This assures you have the improved SAM is also the faster SAM. The 4.0 version scans for viruses significantly faster than its predecessor. Which makes virus protection more seamless and less disruptive to your work flow.

Want more? Okay, SAM is also the only virus protection software that allows you to create a custom decontamination disk specific to your machine. This lets you reboot your Mac easily should your system crash from a virus.

The 4.0 version also simplifies the user interface by combining SAM Intercept and Virus Clinic into one easy-to-use component. This advancement allows you to configure more expert options from one convenient location.

POWER MAC NATIVE.

While these new versions will protect your original Mac, they are also Power Mac native. So those of you with a Power Macintosh can take full advantage of the increased processing power. Ultimately, that

So, pick up the entirely new versions of Norton Utilities and SAM. And then, if you smell something burning at the office, you'll know it's either yesterday's coffee or that guy two cubes upwind who's trying to put out his fiery data disaster. That you well know could have been prevented in the first place.

CALL 1-800-628-4777.

To keep data loss from casting a glow on the office landscape, call 1-800-628-4777 ext. 9FFG. If you own Norton Utilities and SAM, you can order upgrades for $39.95 and $29.95 respectively.* Or you can purchase the new versions at your software store.

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Reviews

Quadra 630

Macintosh Computer

PROS: Inexpensive; good performance; basic AV capabilities included. **CONS:** Sound input and output limited to 8 bits; no video-memory expansion; single slot for system RAM expansion.
COMPANY: Apple Computer (408/996-1010).
COMPANY'S ESTIMATED PRICE: $1279.

MW ★★★★

KEVIN CANDLAND

THE QUADRA 630 MAY BE THE LAST of the 680X0-based desktop Macintoshes and one of the best entry-level Macintoshes ever. Not only is the Quadra 630 affordable, but its performance rivals that of more expensive Macintoshes like the Quadra 800 and 950. The machine also has enough expansion slots for add-ons to make it a multimedia whiz, and it is upgradable to a Power Mac.

Apple estimates the street price of the basic Quadra 630 (4MB of RAM and a 250MB hard disk) to be around $1279, but has no estimate for a fully equipped machine. My guess is that a Quadra 630 with 12MB of RAM, a 300i double-speed internal CD-ROM drive, an Apple TV/Video System, an Apple keyboard, and a 14-inch monitor will be about $2400.

The Quadra 630's case is a completely new design. Its footprint is about the same as that of a Power Mac 7100/66, but the 630 is not as tall. In addition to a power-on light, the 630's front panel has a headphone jack, volume-control buttons, and a remote-control sensor (a good feature for TV channel-surfing and audio-CD track selection). The back panel includes the usual ADB port, printer or AppleTalk port, SCSI port, speaker and microphone jacks, and video port. There are also a few knockout panels that allow you to plug connectors into an optional PDS card or the TV/Video System interface.

The Quadra 630 is built for easy expansion and has a slide-out motherboard (a feature made popular by the Color Classic). To access the motherboard, just snap off a plastic panel and remove two screws on the back of the case; you can then pull the motherboard out easily. The motherboard shows an extremely low chip count due to the highly integrated chip set.

In the center of the motherboard is the 33MHz 68040—the same chip used in the Quadra 650, 800, and 950. The motherboard also sports an LC III–compatible 68030 PDS that accepts most of the cards designed for LC III–style machines such as the Quadra 605 and the LC 575. Memory expansion beyond the barely usable, standard 4MB is limited to a single SIMM slot. The Quadra 630 can be expanded to a total of 36MB of RAM—if you can afford the over-$1000 32MB SIMM.

The motherboard also sports a communications slot, first introduced with the LC 575 series, for either a fax modem or Ethernet module. There is a video-in slot for the optional Apple AV Card, which allows audio and video digitizing, and a connector for a TV-tuner card that supports both broadcast and cable TV. With the optional Apple TV/Video System setup ($249), you can now watch the Sci-Fi Channel and work on your spreadsheet at the same time. You can expand the TV window to full screen when something interesting happens, capture a still frame, or record the whole scene as a QuickTime movie. The AV card allows you to digitize video at a rate of up to 15 frames per second at a window size of 160 by 120 pixels, or 7 fps with a 320-by-240-pixel window. Although not considered high quality by today's standards, the frame rate is adequate for beginners who want to learn more about digitizing video.

Unfortunately, there is no slot on the Quadra 630 motherboard for additional video memory—the video DRAM is limited to 1MB built into the video-display ASIC. The video DRAM does, however, support a monitor at 832-by-624-pixel resolution in 8-bit color depth, or at 640 by 480 resolution in 16-bit color depth. The only way to get 24-bit color is to use a third-party video board that plugs into the LC III–style PDS. It would be nice to have an optional video-memory slot so you could get 24-bit color depth on a 14-inch monitor or 16-bit or better color depth on a 16-inch monitor.

Despite all the optional AV goodies, the Quadra 630's built-in sound is only 8-bit stereo in/out—not the 16 bits of the other AV Macs and the Power Macintoshes (16 bits is the standard for professional CD-quality sound). Whenever you use your microphone through the microphone jack or play a recorded sound, you have only 8-bit audio resolution. Fortunately, CD playback is 16-bit. If you really need to input editable 16-bit sound, you can add third-party hardware or software. Unlike the other Quadra models, the 630 doesn't come with a microphone; you can only use a PlainTalk-compatible microphone.

For Macintosh aficionados, here's a surprise: instead of sticking to the SCSI storage standard synonymous with the Macintosh, Apple used an internal IDE (Integrated Device Electronics) drive common in PC clones. However, this means that standard third-party formatting software such as FWB's Hard Disk Toolkit doesn't work with the 630's internal drive. The only software for formatting the IDE drive is the formatter that comes with the 630's System disk. Fortunately, hard disk utilities like Central Point Software's MacTools and Symantec's Norton Utilities, and backup programs like Retrospect, work as expected. In Macworld Lab benchmarks, the internal IDE drive ran somewhat faster than a SCSI drive of comparable size. You can still attach SCSI devices externally if you have a spare drive. You can also replace the internal drive with a larger IDE drive, which is typically cheaper than the SCSI counterpart. According to Apple, almost all of the new IDE drives work with the Quadra 630.

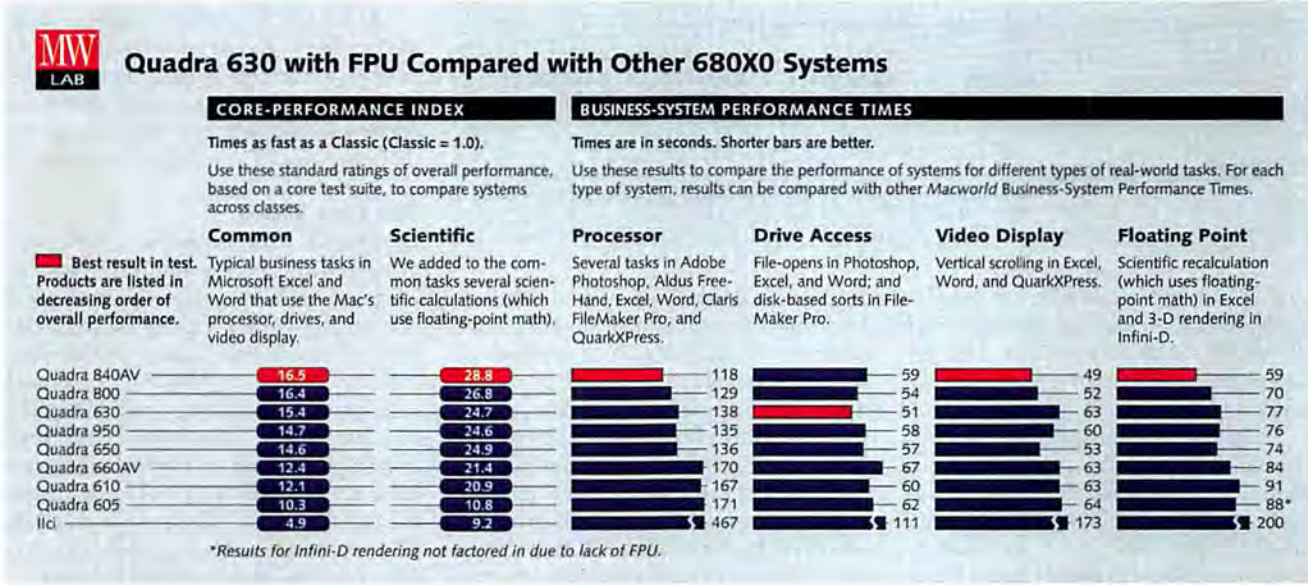
The Quadra 630, like all of the latest Apple products, is Energy Star–compliant. After a certain period of inactivity (you define the period via the CPU Energy Saver control panel), the machine shuts itself down.

Even though Apple markets the 630's 68040 microprocessor as a 66/33MHz chip, the CPU is the same 33MHz chip used in the Quadra 650, 800, and 950. Macworld Lab benchmarks show that the Quadra 630 is about as fast as the other 33MHz Quadras. Understandably, the Quadra 630 is not as fast as Power Macs running Power Mac–native software. If you are interested in the LC 630 and Performa 630 (which are available through the education channels and superstores), they should run just as fast as the Quadra 630 in tasks such as finding and replacing words, scrolling a document, or sorting a database file. However, the Quadra 630 is a lot faster than its LC and Performa counterparts at floating-point–intensive tasks like recalculating a spreadsheet or performing a Mathematica evaluation, since the Quadra 630 uses a full 68040, not the FPU-less 68LC040 processor of the LC and Performa 630 series. The FPU makes the Quadra 630 suitable even for business tasks.

Both the Quadra 630 and the Power Macintosh 6100/60 are marketed as entry-level machines, so a comparison between the two is inevitable. While the 6100 has PowerPC speed on its side, the 630 has a better price and more add-on flexibility. If you need performance, and Power Mac–native versions of your software are available, the 6100 is a better buy. However, if you don't intend to upgrade to native Power Mac software soon, if your favorite application is not yet native, or if you just want to experiment with multimedia production and development, the Quadra 630 is a better choice. The best part is that the 630 is upgradable to a Power Mac so you can always move up when you need to (Apple expects the upgrade to cost less than $500 and to be available in October). And if the performance of the Power Macintosh Upgrade Card for the Quadra 610, 650, 800, and the 900 series is any indication, the Quadra 630 with the upcoming upgrade card should run at least as fast as a Power Macintosh 7100/66. As an additional benefit, the upgrade card can be switched back to 68040 mode so that nonnative applications run at full speed. Finally, the Quadra 630 costs less than the 6100/60; the cost of the Power Macintosh Upgrade Card makes it only slightly more expensive than the base 6100 by about $100 to $200.

The Last Word

Usually entry-level machines lack speed or expandability. Not so in this case. Even with the video- and system-memory expansion caveats, I highly recommend the Quadra 630. If the Quadra 630 is any indication of future entry-level machines from Apple, I can't wait for one that's based on the Power PC.—MARK HURLOW



MiniCad 5

CAD Software

PROS: Fast; easy to use; customizable interface; excellent architectural tools; inexpensive. **CONS:** Lacks some mechanical- and civil-engineering tools. **COMPANY:** Graphsoft (410/290-5114). **LIST PRICE:** $795.

MW ★★★★

GRAPHSOFT, ONE OF THE pioneers in bringing CAD to the Macintosh platform, is now among the first to introduce a Power Mac–capable two- and three-dimensional CAD software package. Architects, engineers, and industrial designers are well advised to look into MiniCad 5. For a suggested retail price of $795, it includes features normally found only in high-end packages, such as Autodesk's AutoCAD, Graphisoft's ArchiCAD, or Intergraph's MicroStation Mac, all of which list for well over $3000.

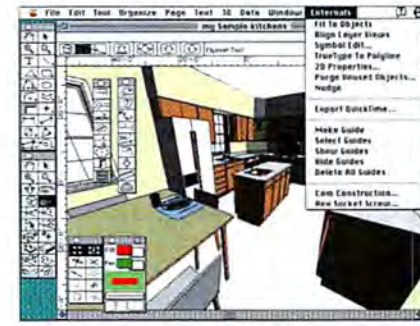
MiniCad 5 is a general-purpose 2-D and 3-D CAD package, but it's well adapted for the architectural, engineering, and construction industries. In addition to offering the accuracy these professions require (up to nine significant digits), MiniCad 5 includes autodimensioning, unlimited layers, a built-in spreadsheet, a database for tracking costs and bills of materials, and the MiniPascal programming language for building custom CAD applications (you can use C++ if you prefer). And because MiniCad 5 can import and export files in DXF, it lets you exchange drawings with other CAD programs and modelers.

MiniCad 5's unique layer-linking capability allows you to treat multiple layers as if they were one. For example, you can link an elevation layer in a 3-D model to a floor-plan layer; then, any changes to the floor plan will appear in the elevation layer. If you assign a height (or z value) to a layer, objects created on that layer automatically show up in correct proportion when you switch to a 3-D view. You can also organize drawings by categorizing objects in classes that operate across layers. For example, you can put your lighting fixtures into a class even if they are scattered throughout the drawing; with one command you can then hide or show these fixtures.

In addition to the hundreds of architectural, mechanical, electrical, and design symbols that MiniCad 5 includes, third-party developers have released numerous discipline-specific symbol libraries for MiniCad, such as collections for classic furniture and kitchen design. You can edit symbols either individually or globally, if for instance, you place a six-panel door symbol in a number of rooms and later decide you want eight-panel doors throughout. This capability can save you a lot of time and frustration.

Like previous releases of MiniCad, version 5 has a "smart cursor" that shows you exact locations of possible snap or target points, letting you draw or modify objects precisely. The smart cursor, which changes shape depending on its location on a selected object, helps you perform certain operations or display information about that object. For example, move the cursor over the handles of a selected rectangle, and the cursor becomes a pair of calipers that calculates the rectangle's area and perimeter. MiniCad 5 also retains the "smart wall," which cuts an appropriate opening when you apply a symbol (such as a door) to it, and heals itself if you remove the symbol.

Besides Power Mac–native operation, MiniCad 5's major enhancements are the addition of externals, which are specialized tools and menu items geared toward a specific profession or discipline, and an OverlayEdit utility, which lets you add the externals to MiniCad's menu bar. You can select these custom environments from a menu and organize a group of externals into a module. Both of these additions allow you to customize the program to fit your particular requirements.



Into the Kitchen MiniCad 5 lets you simulate the experience of flying through 3-D space and capture the flyby as a QuickTime movie.

While MiniCad 5 lets you customize its interface with externals, it also includes three professional modules: architectural, mechanical, and advanced design. These modules are collections of tools, menu items, symbol libraries, and templates particular to a discipline; they can simplify your tasks and increase your productivity. For example, the architectural module provides tools for creating parametric symbols, so you can enter certain parameters to create, say, a door or window symbol. The module also includes tools for making linear and angular measurements, laying out parking lots, indicating revisions, and editing or duplicating symbols.

The mechanical-engineering module provides tools for creating 3-D objects, such as cams, gears, screws, and bolts. The property-display function calculates an object's area, perimeter, centroid, and moment of inertia. The module lacks some important features for mechanical designers, such as solids modeling and volume calculations; and civil engineers will be frustrated by the absence of terrain modeling and other features.

MiniCad 5's advanced-design module is useful in various disciplines. It enables you to create QuickTime movies of motion around 3-D objects, so you can create walk-through and flyby animations that any QuickTime player can run.

The Last Word

Compared with high-end CAD programs, MiniCad 5 is admirably easy to learn. Along with excellent printed manuals, it ships with a CD-ROM that contains an interactive tutorial and an electronic reference of MiniCad tools and commands. If you are new to CAD on the Macintosh or have used other CAD programs, you should be a MiniCad master after a few hours of practice with the expanded tutorial. MiniCad 5 is excellent CAD software offering major performance for the price.—FAYEQ S. OWEIS

MW LAB

How Fast Is MiniCad 5.0?

Best result in test. Times are in seconds. Shorter bars are better.

	Open	Save	Screen Redraw	Render*
Quadra 650 (MiniCad+ 4.0)	19.5	16.8	4.3	109.2
Quadra 650 (MiniCad 5.0)	24.2	5.8	3.6	91.0
Power Mac 7100/66 (MiniCad 5.0**)	14.8	3.6	1.9	25.6

*Shaded with no lines. **Native Power Mac version.

BEHIND OUR TESTS 10,000K of RAM was allocated for each test. Image used was the row house from the sample files included with MiniCad+ 4.0.—**Macworld Lab testing supervised by Mark Hurlow**

Dabbler 1.0

Art-Education/Paint Software

PROS: Excellent features for the price; supports pressure-sensitive pen input; fast; low memory requirements; native Power Mac version available. **CONS:** Unsatisfying results with mouse input; recorded lessons are of questionable value; no transparency controls; idiosyncratic interface requires some learning. **COMPANY:** Fractal Design Corporation (408/688-5300). **LIST PRICE:** $99.

MW ★★★

FRACTAL DESIGN'S NEW PAINT program is notable right off the bat for a number of reasons. First, version 1.0 is available for both Macintosh and Windows platforms as well as for Power Macs. Second, you get 16-bit color and a remarkably powerful paintbox for the price; and unlike Fractal Design's professional-class Painter, Dabbler is fast and responsive on LC- and Performa-class Macs. Third, Dabbler provides lessons from the well-known Walter Foster learn-to-draw series, both in the 50-page printed manual and in an on-screen tutorial.

Dabbler adopts the metaphor of a sketchbook on top of a drawing table that's fitted at the top with four drawers. Using a ⌘-*key* or clicking on a drawer front toggles each drawer open or closed with a satisfying snap. The tool drawer contains a simplified selection of the "natural materials" found in Fractal Design's other paint programs; the most recently selected tools display on the front of the drawer (whether open or closed), keeping them conveniently close at hand. Most tools give you the option of small, medium, and large points (as opposed to the professional tools' infinite variability); switching sizes produces an audible *ping*—a different pitch for each size. An "extras" drawer opens automatically whenever a selected tool has options or special effects to offer. The color drawer contains 16 customizable palettes, including 8 gradients. You can reverse each texture in the papers drawer with a click of the button, yielding 40 drawing surfaces.

Dabbler's operation is generally intuitive and easy to learn, but Fractal Design took some bold liberties with the interface that may confound seasoned Macintosh users. For example, ⌘-O does not open a painting but instead imports a graphic from another program (it works with PICT, TIFF, Adobe Photoshop, and various Windows formats). To work on an existing Dabbler painting, you open the tool drawer, click on the sketchbook icon, and page through until you reach the picture you want. Then when you close the tool drawer, the painting appears on the drawing table. Pictures save automatically to the sketchbook in Dabbler format; you can also save files in the common Mac and Windows graphics formats. To delete a work, just drag it off the open sketchbook and into the adjacent trash can; a pushpin inside the tool drawer lets you temporarily remove a page so you can reorder it in the sketchbook.

Other deviations from standard Macintosh conventions take even more getting used to. For example, in place of the Mac's familiar selection tools, Dabbler uses a series of stencil tools—rectangle, oval, star, heart, free-form, and polygon—and requires you to select a separate float tool to move a selection. Additional stencil tools let you apply surface textures that you choose from the textures drawer, and you can also apply Photoshop filters. Dabbler has no line tool, but you can select Draw Freehand or Draw Straight Lines from the Options menu. Another oddity is that to apply gradients or text at an angle, you must use the page-rotate tool to turn your sketch. Finally, Dabbler makes good use of keyboard shortcuts, but there's still too much opening and closing of drawers for my taste.

Now, can Dabbler really teach you to draw? Just possibly.

First, don't be fooled by the old-fashioned Walter Foster sketches. If you faithfully practice the follow-along drawings in the manual's instructional pages, you might just achieve some commercial-art skills. True, the woman's profile looks suspiciously like that of a young Greta Garbo, and the perky bunny looks like Disney's Thumper, but this lends the lessons a measure of charm and whimsy. No matter what drawing style you ultimately develop, the content of Foster's lessons is genuinely useful and applicable: rules of proportion and perspective, advice on sketching with pencil or charcoal before proceeding to ink—and some words of encouragement as well.

On the other hand, while it's entertaining to watch sample drawings take shape before your eyes, I question the value of the recorded sessions that you can play back (frame by frame or at full speed) via VCR-type controls. If you're quick, you'll see the icons change when a new tool is selected, and some drawings have captions explaining the operations currently under way. But I didn't find it useful to watch the disembodied lines accrue on the page.

More significantly, perhaps, the Walter Foster drawing system was designed for natural materials—chalk, pencil, and so on—not electronic paint programs that emulate natural materials, and not all the techniques are transferable to the digital sketchpad. Whether you draw with the mouse (which I don't recommend) or with a pressure-sensitive stylus and tablet, the physical act of sketching on screen requires a different kind of hand-eye coordination from that needed for sketching on paper. Dabbler does a good job of re-creating the appearance of, say, charcoal on a toothy paper, but once on screen, pixels are pixels: it's hard to erase your pencil guidelines and leave only the ink-brush lines.

The manual is divided into two sections, one on the Dabbler application and one on the Foster lessons. The Dabbler portion does a fine job of introducing the program's tools and interface, but lessons on digital painting techniques would be helpful, especially when it comes to Dabbler's admirably advanced features, including its ability to acquire images directly from scanners, its autocloning capability, and a tracing-paper mode.

The Invisible Hand Dabbler allows you to play back prerecorded sessions showing how an expert might draw a still life or a trio of singing cowboys, for example. You can then use the tracing-paper option to practice drawing the scene yourself. You can even record and annotate your own drawing process to produce lessons for others to follow.

The Last Word

Whether you opt to study the Walter Foster drawing method or go it alone, the key to artistic skill is practice, practice, practice. By providing an excellent paint set with an appealing if slightly quirky interface at a great price, Dabbler makes it easy to stick with the program.—MARJORIE BAER

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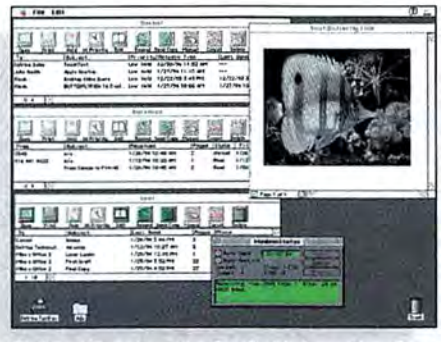

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Apple Personal Diagnostics

Hardware-Diagnostics Utility

PROS: Tests and repairs disk directories; provides system information and benchmark tests; extension performs diagnostics during idle time; manual includes some useful tips and charts. **CONS:** Some features weak or missing; poor interface; inadequate manual; of limited use to most users; lacks emergency disks for many Mac models; incompatible with Power Macs; overpriced. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S ESTIMATED PRICE:** $129.

MW ★★

APPLE PERSONAL DIAGNOSTICS (APD) focuses on diagnostics for Mac hardware components. Given Apple's obvious advantages in this field, APD should be a winner. However, in trying to make a hardware-diagnostic tool for the rest of us, Apple has come up short.

Apple starts off on the wrong foot by omitting two emergency start-up disks. If you need an 800K disk, or if you own a Centris or Quadra 610, 650, 660AV; Quadra 800 or 840AV; a Macintosh TV; or a Workgroup Server 60 or 80, you need to order a $10 disk—which is not mentioned on the box. And APD 1.0 isn't compatible with the Power Macs, though version 1.1, shipping soon, will be. APD consists of an application and an Automated Diagnostics extension.

The Diagnostic Tests window presents check boxes for five sets of tests: Logic Board, Hard Drive, Floppy Drive, System Software, and Display Patterns, each of which you can optionally loop. Alas, APD has no preferences feature; relaunching resets all options to their defaults. And those options are limited. You cannot isolate logic-board components or individual System Software tests, for example. (It's worth noting, too, that Disk First Aid, included with the Mac system, provides the same functionality as APD's System Software tests.)

If your Mac passes all APD's tests successfully, a "Test Passed" message flashes on screen. But some tests are not thorough. For example, the floppy drive test accepts either an 800K or 1.44MB disk, rather than asking for both. Testing both encoding methods is essential to checking a SuperDrive. On one disk I used, APD locked out bad sectors during the verification test yet passed the drive without comment. Reinitializing the disk in the Finder yielded no media errors, but APD repeatedly locked out sectors—without ever notifying me. APD should have suggested that I retest with another floppy disk to see if the error was due to a bad disk or a problem with the drive or my software. In this case, the problem was not a bad disk, so it could have been a dirty or malfunctioning drive—exactly what APD is supposed to find.

The System Info and Benchmark Checks features aren't the primary focus of APD, but even so, superior software alternatives are available as freeware and shareware. System Info—which tells you what Mac you have, how much RAM is installed, the version numbers of parts of the installed System software, information on installed extensions and applications, and a few details about SCSI devices—is useful but limited and inflexible. For example, Control Panels and Extensions Info gives the names and versions of installed extensions but not info on RAM usage, size of disk, traps patched, load order, disabled extensions, and so on. APD's SCSI and slot information is similarly skimpy; for example, the slot info covers NuBus but not the PDS.

Apple Interface Diagnostics The main application window offers four diagnostic selections.

There are three math tests (integer, complex, and FPU); two speed tests (memory and CPU); one video test (which does not cycle through all bit depths); and a quick, generic read/write hard drive test that's too short to provide any reliable data and cannot be set to run multiple iterations and obtain an average. Without more control and detail, plus the ability to save, annotate, import, and export records, APD's benchmark checks aren't useful or meaningful.

The Automated Diagnostics extension (which requires System 7) performs a subset of the diagnostic tests during idle time. You configure Automatic Diagnostics from within the application; a control panel would have been a more convenient way to enable or disable the extension (you can't choose individual tests), set the idle-time threshold, and choose the way it notifies you that testing is active. Last, a status field reports when tests were last run and whether the system passed or failed. Vexingly, APD clears that field any time you restart your Mac or run tests within the application.

To get specifics on problems that APD detects, you must create a report. Reports are highly configurable, but they're in a proprietary file format and can't be exported to text or pasted into another program. The Help window presents cursory, context-sensitive descriptions of control items. All the documentation is in the slim manual.

More significantly, the manual is uneven. The troubleshooting chapter gives explanations and responses for all APD error messages, but inexplicably recommends rebuilding the Desktop if the logic-board or RAM tests fail. An excellent section on SCSI termination and troubleshooting is preceded by references to drives being removed after launching the program, as if detaching SCSI devices with the Mac turned on were acceptable. While the manual suggests using third-party utilities for repairing directory damage, when it addresses lost folders and files it makes no mention of data-recovery utilities or services; instead, it suggests that you back up what you can and reformat. It has tables on RAM, VRAM, and card slot upgrades, but no tables of sad-Mac or system error codes.

The Last Word

The real question is, Do you need this type of program at all? For most users the answer is no. Most computer problems aren't due to hardware component failure, and those that are generally (1) are obvious enough to diagnose without software, (2) are severe enough to prevent you from running diagnostic software, or (3) involve hardware not checked adequately or at all by APD. The Mac already runs a thorough self-diagnostic test at every start-up and checks most of the things that APD checks—that's what the happy-Mac symbol means.

If Apple had provided a solid, versatile utility with an elegant interface and extensive documentation, I'd have recommended it. Such a program could be useful for everyone from advanced users to consultants and system administrators. Sadly, APD is not such a program, and it's just too pricey for the novelty of having your FPU checked in the background.

—PETER STOLLER

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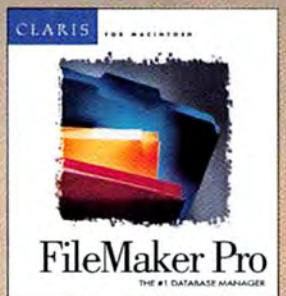

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ScanPrepPro 1.2

Photoshop Add-on

PROS: Automates scanning and image correction; incorporates understanding of image reproduction and Photoshop tools; excellent reproduction of previously screened images. **CONS:** Somewhat unstable; line-art mode doesn't use sharpening; doesn't correct for color shifts and casts. **COMPANY:** ImageXpress (404/564-9924). **LIST PRICE:** $695.

MW ★★★

DOES THIS DESCRIBE YOU? YOU'VE got a scanner. You've got Adobe Photoshop. The tools are there for producing top-quality scanned images, but you're not getting them. Gray-scale and color scans are muddy, dark, and blurry. Line art is jaggy. Scans of halftoned images are unusable. And you spend extraordinary amounts of time producing scans you're not happy with.

A solution might be to buy ScanPrepPro—a Photoshop add-on that automates the scanning and image-massaging process. ScanPrepPro actually takes over Photoshop, employing a wide variety of Photoshop's tools to work with a wide variety of scanned images. And it has a lot of built-in smarts that help it gauge what adjustments images need for superior reproduction and how to use Photoshop's tools to achieve that end.

ScanPrepPro can set resolution and image size (including any resampling required for the target screen frequency), tonal correction (adjusting the range of grays or colors via Photoshop's Levels control), sharpening (using an intelligent approach to the Unsharp Mask filter), pattern removal for previously screened images (as much as that is possible), and threshold adjustment for line-art scanning. ScanPrepPro works with scanners, Photo CD, laser printers, imagesetters, and continuous-tone printers—with optimized settings for each.

ScanPrepPro can control some scanners directly, via their Photoshop Acquire plug-ins. (If your scanner isn't supported directly, ScanPrepPro tells you what settings to plug in manually. Or you can open any image in Photoshop and then tell ScanPrepPro to work its magic on that image.) The ScanPrepPro Calculator sets up all the scanning parameters, prompting you to select the area to be scanned. When the scanning is finished, you select the ScanPrepPro Agent, which goes through the rest of the image-correction steps.

ScanPrepPro has modes for scanning line art, gray-scale images, and color images, with a lot of options for each. With gray-scale images, for instance, you can specify that the image has a full range of grays and that there are specular highlights (like reflections from chrome). When you work with images that are mainly, but not entirely, black and white, ScanPrepPro's dropout feature keeps the blacks and whites true while retaining subtle gray details—always a challenge.

ScanPrepPro doesn't do the best tonal correction on previously scanned images; a skilled Photoshop user can do better. But when ScanPrepPro controls the right scanner (an Agfa or a La Cie SilverScanner, for instance), it can do an excellent job of tonal correction.

ScanPrepPro does not address some of the real bugaboos of color-image correction such as tonal shifts, color casts, and the like, but it does nicely in most other areas—notably separation.

ScanPrepPro's line-art mode doesn't use sharpening, which greatly reduces the quality it can provide. This is surprising, since its Copy Dot mode (designed to reproduce previously screened images dot for dot—essentially capturing them as line art) does use sharpening and provides the best results I've seen. The solution is to use Copy Dot for all line-art scanning.

While ScanPrepPro's single dialog box is a model of simplicity and functionality, the program itself is something of an octopus. For example, disabled menu items can still affect what's happening. Sometimes the process of jumping in and out of dialog boxes, choosing options, and tweaking settings stops inexplicably, resulting in a crashed Mac (this happened more than once with all system extensions off). And you sometimes need to remind ScanPrepPro to accomplish simple things—like copying the dimensions of an already scanned image.

ImageXpress updates ScanPrepPro constantly, which can be an annoyance. The previous version worked fine with the Hewlett-Packard ScanJet, for instance, but version 1.2.3 doesn't, and it's not clear how long we'll have to wait for that particular fix. However, the company's unlimited free tech support (albeit on a toll line) does a great deal to obviate that problem.

The Last Word

ScanPrepPro is not perfect, but it goes a long way toward automating a process that can be confusing, difficult, and time-consuming. ScanPrepPro produces good results—sometimes better images than could be produced by any but the most skilled operator.—STEVE ROTH

LogoMotion 1.0

Animation Tool

PROS: Affordable price; approachable 3-D tools; provides animation plug-ins. **CONS:** Middle-of-the-road rendering tools. **COMPANY:** Specular International (413/253-3100). **LIST PRICE:** $149.

MW ★★★★

IF YOU DON'T NEED PROFESSIONAL-level 3-D tools, or you simply want to dabble in 3-D, take a look at LogoMotion, an easy-to-use 3-D package that's eminently affordable. As its name suggests, LogoMotion is designed to facilitate the production of 3-D flying logos, like those from TV-movie-of-the-week titles. LogoMotion enables you to extrude text objects from TrueType and PostScript Type 1 fonts, apply surface textures to the objects, construct animated sequences, and render finished images.

But LogoMotion is more than a type extruder. It offers enough modeling, rendering, and animation power to make it a decent all-around 3-D package for budget-conscious graphic designers, entry-level users, and budding animators.

Flying Made Easy LogoMotion is designed for creating flying logos but can also serve as a general-purpose, entry-level 3-D modeling and animation program.

LogoMotion derives from Specular's Infini-D but emphasizes simplicity. For example, LogoMotion offers front, side, and top views, plus one camera view. The resizable camera-view window is the main work area; the other fixed-size views are for orientation. And LogoMotion's palette holds only text, lathing, and extrusion tools, along with object-manipulation and -scaling functions.

LogoMotion keeps Infini-D's Workshop feature, which lets you edit the outlines of lathed and extruded objects, as well as edit EPS outlines imported from Aldus FreeHand and Adobe Illustrator.

continues

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LogoMotion supports publish and subscribe, so editing EPS outlines in the originating program automatically updates the 3-D model in the Workshop; it also imports objects in DXF and Swivel 3D formats. LogoMotion's modeling features are essentially equal to Infini-D's.

The same cannot be said for LogoMotion's animation and rendering tools, but its simplified animation Sequencer is more than adequate for the program's flying-logo mission. And LogoMotion includes important controls such as motion ease-in and ease-out, as well as some more-advanced animation features such as spline-based motion paths and the ability to morph both surfaces and objects. Overall, LogoMotion's animation capabilities strike a good balance between the sometimes contradictory demands of power and usability.

And LogoMotion makes it easy for novices to get started in moviemaking, by providing a useful assortment of StageHands—plug-in backdrops, cameras, environments, lights, and props—that automate the creation of animations.

LogoMotion comes with almost two dozen surfaces that you can edit for color, metallicity, reflectivity, and specularity, and from which you can create new surfaces and new surface libraries. The program offers two levels of rendering: a fast setting that generates flat shadings, and a better setting that produces images with reflections, fog, and environment effects.

LogoMotion can produce 32-bit renderings with alpha channels, even on Macs without 32-bit video. Generally speaking, images produced with LogoMotion aren't broadcast-quality, but they're perfectly adequate for graphic-design applications and corporate presentations. If you need better rendering, LogoMotion can export models to Infini-D for ray-tracing.

LogoMotion runs without a whimper. You know a developer is confident when the manual encourages you to learn the program by clicking about and seeing what happens. The manual itself is understandable and even fun to read. It could be a bit more thorough, but that might run counter to the theme of simplicity.

The Last Word

All in all, LogoMotion is a terrific program. It's great for creating quick flying logos for corporate presentations—its intended purpose. However, with its excellent balance of modeling, rendering, and animation features, LogoMotion may find just as much use as an entry-level 3-D package for nonprofessionals and maybe even the education market.

—CARLOS DOMINGO MARTINEZ

TeamFlow 3.1

TQM Flowchart Software

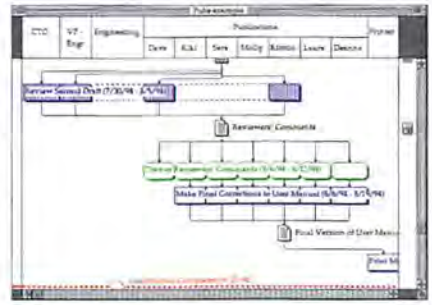
PROS: Clear diagrams; can attach documents to steps; includes departmental and team hierarchies; can diagram main processes and subprocesses.
CONS: Simple Gantt chart; limited printing of reports; limited customizability of flowcharts and reports. **COMPANY:** CFM (617/275-5258).
COMPANY'S ESTIMATED PRICE: $295.

MW ★★★

COMPUTER TOOLS TO AID MANAGERS in preparing TQM (Total Quality Management) projects are few and far between. TeamFlow lets you create special flowcharts, called process or deployment flowcharts, which show how tasks and reports pass from person to person and who has responsibilities at different stages of a project.

TeamFlow is easy to use. Since process flowcharts start with the team members, TeamFlow prompts you to first enter the names of the members of your team. The team database can consist of members' names and their positions in an organization chart or info such as address, E-mail address, phone number, and fax number. TeamFlow automatically draws the organization chart for the team.

Once you've created a team database, you use the work space to create flowcharts. Team members' names are displayed across the top of the work space. You add process steps to a flowchart by clicking on the work space beneath the person responsible for that step. When you click, a palette of possible process types—task, meeting, report, decision, or milestone—appears. You can add details such as start and finish dates, budgeted cost, and team leader. You can include other team members in the step by dragging the symbol for the step you've defined to the columns corresponding to the other team members.



Process Chart This section of a process chart shows steps in producing documentation for a new software product. Shaded items are already completed, while unshaded items remain to be done. The small icon to the right of the item labeled Reviewers' Comments indicates that an external document has been attached to that process step.

You can link process steps by dragging the cursor from one process step to the next. The program draws an arrow between the linked steps. If you have a decision point in your diagram and it leads back to a previous step, you can draw a feedback arrow, which is a dashed arrow rather than a solid arrow.

When you're dealing with any good-size project, your process chart is likely to get quite large and complicated. TeamFlow allows you to simplify the look of your chart by creating summary symbols, which when selected display new work spaces with additional details of a process.

If you include start and finish dates for each process step, TeamFlow also draws a Gantt chart to show you the sequence of events in the project. The Gantt chart doesn't include many of the features found in more complex project-management software; for example, you cannot customize the symbols on the chart or show allocated resources or slack times, as you can in Microsoft Project. But TeamFlow's Gantt chart gives you a reasonable idea of your project's schedule. You can also view a Gantt chart for just one phase of a project.

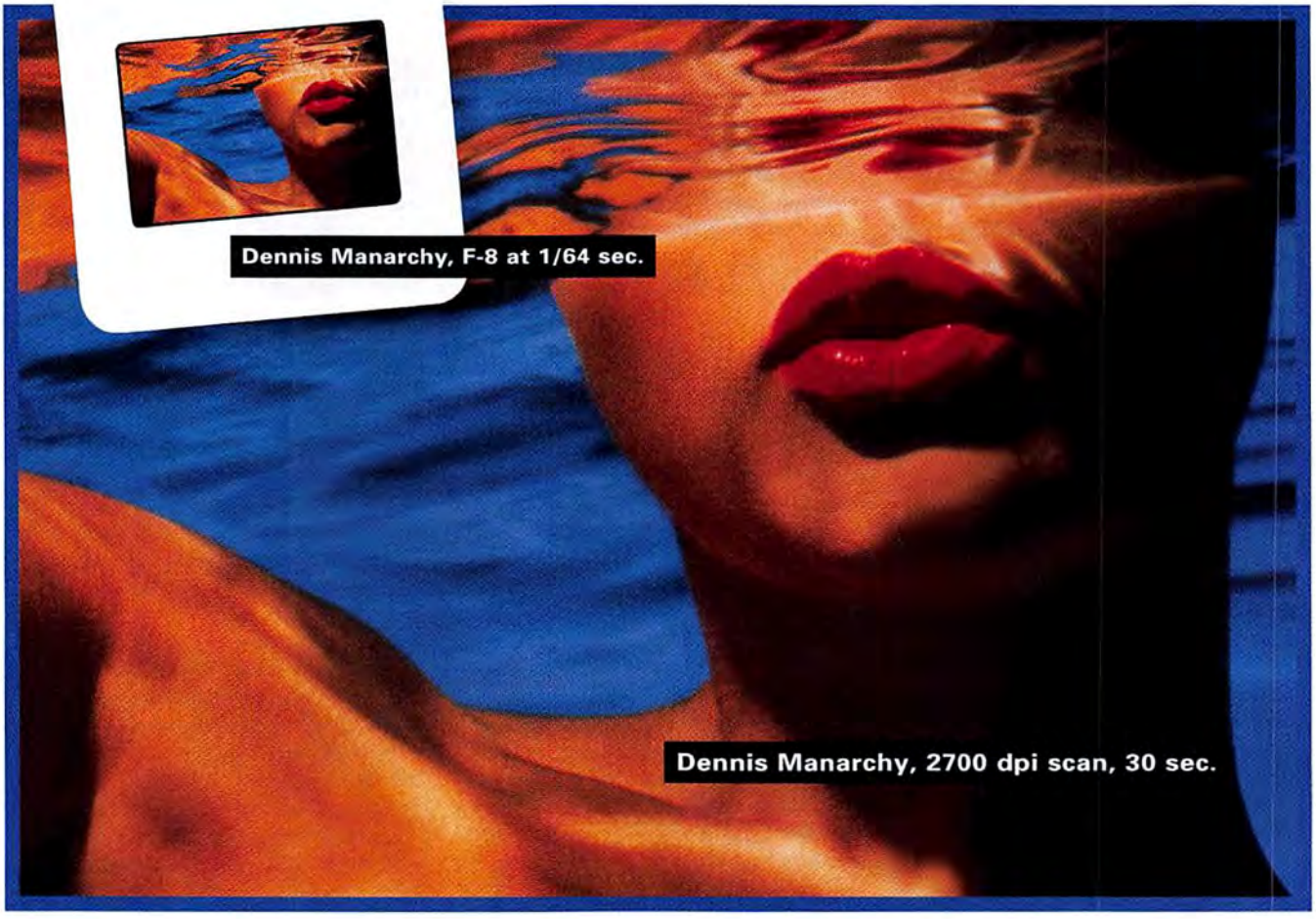
For tracking project costs, if you enter start and finish dates for a step, TeamFlow uses a linear earned-value algorithm to calculate the budgeted cost of the work performed, based on the current date. If you add the actual cost at some later time, the program also calculates the cost variance. However, the only way you can view the results is to open the description window for each process step individually. The total cost of your project and its variance appears in the program information window. There is no way to print a report of the project's budget.

You can attach documents to any process step. In keeping with the TQM approach, TeamFlow calls attached documents either quality standards or reference documents. Quality standards might be objective criteria that must be met for a decision point, while reference documents might be meeting reports. TeamFlow also provides for referencing hard-copy documents.

The Last Word

TeamFlow's strength lies in making it easy for you to plan, or dissect, your work processes, concentrating on the details of your work, not the details of the program. For that reason, it's a valuable business tool that I recommend—there is no other Mac program like it.—DAVE KOSIUR

The only thing missing is the wait.



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First Things First Proactive 1.1

Scheduling Program

PROS: Outline view; event-entry templates; items are easy to reschedule. **CONS:** Events in adjacent months are hidden; no text wrap in monthly calendar; no contact-manager links. **COMPANY:** Visionary Software (503/246-6200). **LIST PRICE:** $149.

MW ★★★

I'VE LOST COUNT OF THE NUMBER OF times the Mac has saved my life by alerting me to a crucial appointment. I've always liked First Things First (FTF) for basic reminders, but it lacked advanced scheduling features. With the release of FTF Proactive (FTFP), Visionary Software is trying to muscle in on its high-end competition by adding new features.

FTFP retains the standard version's handy clock that floats above the desktop. (If the clock gets in your way, you can dock it in the menu bar.) Double-clicking on the clock launches FTFP and automatically opens the default calendar file. The program provides a flexible suite of calendar views, with single-day, multiday, monthly, and yearly options (the weekly calendar is simply a multiday view with seven days showing). In the single-day and multiday windows, each day is divided into two sections, with untimed to-do items at the top and an appointment-book–style grid at the bottom.

FTFP's monthly calendar suffers from a few weaknesses. For example, events that fall in the visible portion of the preceding or following month don't appear on the current month's display. Although the software lets you jump to days in adjacent months by clicking on miniature calendars, I found the tiny dates almost impossible to read on my 13-inch monitor. A bigger problem is the lack of text-wrap capability in the monthly view. If you're not careful when entering an event's description, you could be left guessing about who you're supposed to meet, since some of the event's text may not show.

In addition to the standard views, FTFP lets you look at your schedule in outline form—a boon for people who find it easier to organize to-dos and appointments in a hierarchical format. The outliner accommodates up to 50 levels, which should be ample for even the busiest schedules. You can create events in the outline and drag them to the calendar to schedule them. Another handy option lets you assign project deadlines to FTF files, so you receive a warning when you try to book an item past the project's due date.

Unlike some other schedulers, FTFP doesn't distinguish between to-dos and appointments. When you post a new item, you have the option of entering a date and a start time or leaving the item unscheduled. You can also give an ending time to events that have a specific length. (Alas, there's no way to enter an item's duration directly.) You can assign items any one of four priority levels, and you can organize items into categories of your choosing; you can't, however, display categories in different colors the way you can with Now Up-to-Date.

Custom Event For frequently scheduled items, you can create Item Stationery templates with some fields already filled in.

FTFP sports a few other convenient features. For example, Quick Reschedule lets you move one or more events by a specified interval. I also like the way you can set reminders to appear both at and in advance of an item's scheduled time. Finally, if you find that you often book certain types of events such as lunch meetings, the program lets you create Item Stationery templates with many of the important details already filled in.

FTFP users can share schedules by hierarchically linking their calendars to master files on local or remote volumes. It's an unusual approach, but even new users should have little trouble getting up to speed in short order.

In an admirable effort to conserve resources, Visionary Software distributes the user's guide in the form of an Apple DocViewer file. However, the manual takes up almost 3MB on disk—a potential problem if space is tight.

The Last Word

All in all, First Things First Proactive is a capable performer that builds on the strengths of its predecessor. It's worth a look if you need a scheduling program and don't have to share information with a contact manager.—FRANKLIN N. TESSLER

Kekulé 1.1

Science Software

PROS: Near 100 percent accuracy, even on poor scans. **CONS:** Mac version missing features compared with PC version. **COMPANY:** PSI International (410/821-5980). **LIST PRICE:** $495.

MW ★★★

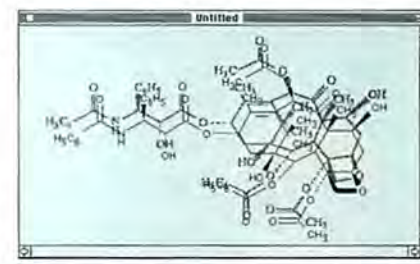
NOW, WHY DIDN'T SOMEONE think of this program ten years ago? Kekulé reads scanned chemical-structure drawings and interprets them, giving both a diagram for checking interpretation accuracy and a formal string representation of the structure. The need for an automated interpreter of structures has been desperate since the first appearance of computer chemical modeling. Let me explain.

In the mid-1980s, a number of firms developed the first practical chemical databases. These databases let users retrieve the chemical properties of a given molecule from a structure drawing or formula name; the databases could also be used as an inventory system. Inventory systems might sound trivial, but when the databases were actually implemented and lab notebooks converted to electronic files, some companies found to their dismay that in-house duplication of syntheses (that is, a chemist trying to create a compound that someone in the company had already made) ran a terrifying 30 percent.

The problem with these databases was that structural data had to be entered by hand. Companies hired platoons of data entry staff, who would sit at terminals drawing chemical structures, a tedious, time-consuming chore.

PSI, however, not only thought of automating structure-data entry but did a near-perfect job of implementing it. Kekulé is the chemistry equivalent of an OCR (optical character recognition) program—it's a utility that scans and interprets printed chemical structures. Since

continues



A Taxing Structure Kekulé interprets this slightly fuzzy scan of the structure of taxol correctly.

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these structures are usually of modest size on a page, Kekulé is oriented toward the use of inexpensive hand scanners. The structures are also black and white, so it's actually hard to find a scanner that's not good enough for use with Kekulé.

You scan the structure into a TIFF file using either your scanner's own software or the KekScan utility included in the Kekulé package. You select Convert Scanned Image from the Scan menu, indicate the TIFF file you want interpreted, and Kekulé grinds away turning the file into an interpreted structure. The program presents the result against a grayed version of the scanned structure—this makes it easy to compare structural details and make sure Kekulé captured everything correctly.

What's amazing is how well Kekulé works. I assumed that by scanning tiny textbook figures and low-quality faxes of structures from *Science* I could provoke an interpretation-success rate like that of an OCR program, for which 98 percent accuracy on good material is typical. Kekulé processed 20 scans at 100 percent accuracy, including scans of molecules with unusual types of bonding. A likely explanation is that Kekulé takes advantage of a hierarchy of interpretation rules that take all possible chemical information into account. Even when a *C* looks like a closed blob in a scan, the program doesn't mistake it for an *O*—bonding information undoubtedly gives Kekulé an edge over OCR programs in this regard.

The interpreted structure can be sent directly to Cambridge Scientific's ChemDraw and hence to the whole ChemOffice suite. Unfortunately, in order to send structures to SoftShell International's ChemIntosh or to software from MDL Information Systems you have to buy a third-party format converter from Exographics (201/728-0188). Different connection-table formats for exchanging structures with standard minicomputer programs are also supported in the PC version of Kekulé, but not in the Macintosh version.

These file-exchange infelicities are a problem, but Kekulé's outstanding performance at its main function makes it a problem you'll want to tolerate. The educational and student versions are the same program as the commercial product, making it a bargain for most of the people who need it.

The Last Word

Every lab that uses ChemDraw or ChemIntosh needs a copy of Kekulé and a scanner. It's that simple. Kekulé will save you months of chemical-structure data entry work.—CHARLES SEITER

Drive7 3.0

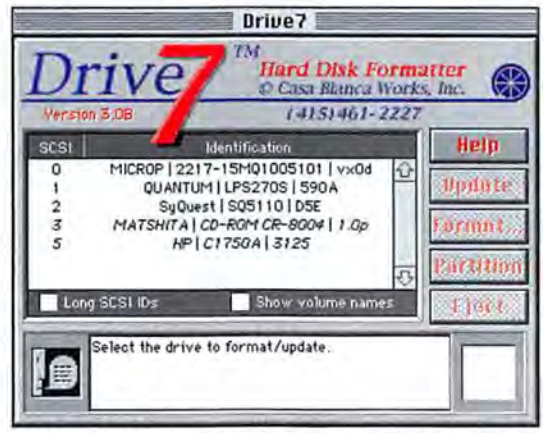
Hard Drive–Formatting Utility

PROS: Boosts drive performance; simple to install and use; on some Mac models, lets you format a drive while continuing to work. **CONS:** Disk-caching capability can use lots of system RAM. **COMPANY:** Casa Blanca Works (415/461-2227). **LIST PRICE:** $79.95.

MW ★★★★

DRIVE7 FROM CASA BLANCA WORKS is a program that easily performs just about any hard drive–formatting chore. You can format, test, and partition most SCSI drives—and you can boost performance too, using the Mount Cache control panel, which sets aside system RAM to cache data.

Drive7 does most of its disk updating, formatting, and partitioning chores from a single window. Five buttons activate its basic functions (and provide online help). For more-sophisticated formatting options, you select Functions or Options from the menu bar.



Making It Simple You perform fundamental hard disk-formatting chores by pressing the appropriate button in Drive7's application window.

In addition to the same basic operations as those in the application window, the Functions menu gives you the ability to set SCSI ID by software (for drives that support this function), test your drive after formatting, and even select a hard disk icon from about 48 choices.

The Options menu lets you configure your disk-formatting options, such as the default disk name and partition style, and driver options, such as blind or polled reads (useful for slower Macs, and required by some accelerator boards). The Options menu also allows you to remap a disk's bad blocks automatically. One additional feature, Drive7's automatic stop time, causes a hard drive to spin down after an interval of inactivity and, like a PowerBook, spin up again as soon as you read from or write to the drive.

Casa Blanca Works has added a unique feature that's reserved for Macs with SCSI Manager 4.3 (the AV and Power Macintosh lines) and those that support SCSI-2 (the rest of the Centris and Quadra lines). If you own one of these models, you can actually format a drive and continue working in another program at the very same time. (I did the first draft of this review as Drive7 was busy formatting another drive.) At the worst, you'll probably witness a slight performance slowdown. Since formatting a large hard drive is apt to take anywhere from half an hour to an hour, this is one neat way to stay productive (unless you'd rather take a lunch break).

The Mount Cache control panel handles several chores. The most important is its ability to set aside a portion of RAM to cache frequently used data from your drive. This feature is similar to System 7's disk cache but more sophisticated in its execution. You set aside a specific amount of RAM for each drive. You have the option to turn off your system's cache and let Mount Cache do all the caching, or let both the system cache and Drive7 cache work at the same time. If you have several drives installed on your Mac, RAM usage can add up. It also takes a little trial and error to get the best setting, but I observed a noticeable (although not vast) performance boost when I tried Mount Cache on an old and slow Maxtor 127MB drive (I gave it a 256K cache).

Drive7's Mount Cache can also mount removable devices such as SyQuest and Bernoulli cartridges. You can also set partition options—for example, whether a drive is write protected, mounts automatically at time of start-up, has password protection, or is used as a boot partition.

The Last Word

Drive7 doesn't quite have the powerful driver-customization tools offered by FWB's Hard Disk ToolKit—but it doesn't really need them. For the vast majority of users, those features simply aren't necessary. Drive7 easily formats and partitions most drives and provides all the options you need. And within its limitations, its Mount Cache utility provides a real performance boost. I recommend Drive7 highly.—GENE STEINBERG

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*Official 1993 Monitrak U.S. monitor sales research.

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OmniPage Professional 5.0

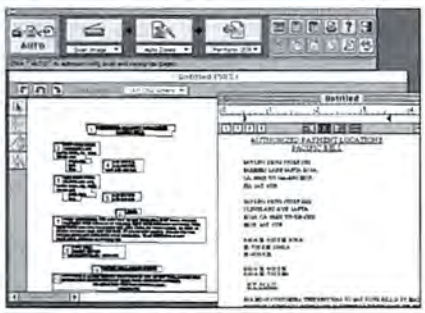
OCR Software

PROS: Accurate on clean documents; compact; efficient; includes math type-symbol display. **CONS:** Complex real-world documents still a challenge. **COMPANY:** Caere Corporation (408/395-7000). **LIST PRICE:** $695.

MW ★★★★

IN *MACWORLD'S* LAST roundup of OCR (optical character recognition) software ("OCR: The Recognition You Deserve," November 1993) we predicted that if a vendor produced a PowerPC-based OCR program and put every state-of-the-art method into the package, recognition accuracy could approach 100 percent on "good" documents. We were right.

OmniPage Professional 5.0 is just such a program. It reads documents typed on an IBM Selectric with a Courier type ball, it reads clean laser-printed documents with standard fonts, it reads plain black-on-white magazine text (*The New Yorker* is a better target than *Wired*, for example), and it reads all three categories at 100 percent accuracy. That's a historic first in OCR. Earlier programs could approach this accuracy with extensive training on particular fonts (OmniPage Pro supports training, too), but this program produces this accuracy level right out of the box. The Power Mac has enough throughput that OmniPage can call out trigram-frequency analysis (three-letter combinations), a spelling checker for error detection, its proprietary so-called 3-D OCR (it uses gray-scale information for improved accuracy on fuzzy letters), context analysis of word-pair frequencies, and a type of neural-net–based image sharpening—and still get a page interpreted in 8 seconds or so. You can use a Mac IIci, but the processing time goes beyond a minute per page.



Zoned Out Auto Zones works well on simple documents; the reading accuracy is excellent on clean text; and you direct the most common OmniPage operations using a handful of tool-bar icons.

The interface has been greatly improved. All you do is click on a single button to scan, zone, and interpret a document. You can also click on the Check Recognition button in the tool bar and review doubtful readings case by case. The Auto Zones function works well enough for plain text blocks (a good thing, too, since overriding it is awkward). But even using OmniPage's True Page option, which isolates and preserves graphics scanned along with text, zoning (and with it interpretation) is often foiled by graphics that have text prominently overlaid. That's not a problem for scanning legal documents, but OCR, even in OmniPage, still couldn't scan in a standard *Macworld* article with infographics and get the whole thing right. Nonetheless, OmniPage and its slick new interface can handle most business OCR tasks.

As you would expect, this program supports every scanner currently sold in the Mac market and can save files in the formats of every common word processor. OmniPage Pro 5.0 also includes a copy of Image Assistant, an application with most of the features of Adobe Photoshop but without native-mode speed. Image Assistant is handy for touching up scanned graphics.

OmniPage Pro still makes some baffling, small errors on real-world documents. It usually preserves formatting (bold, italic, font size) correctly, but sometimes it puts the bold format on the wrong words in a line where bold text occurs. Occasionally, it blows up the point size of text in part of a line for no apparent reason, and it will lowercase random letters in the middle of an uppercase line. Finally, and this is hard to understand in light of the trigram-probability checking, in some fonts OmniPage persistently reads *the* as *teie*. As long as I'm complaining, I should note that you can expect to wait a half hour or more to reach Caere's customer support, which fortunately has all the answers once you get through.

The Last Word

OmniPage Professional 5.0 is the first program to do what most users actually expect of OCR. On good text samples, its accuracy is 100 percent, which is realistically what's required for an OCR product in most businesses. At present OmniPage has no competition on the Power Mac.—CHARLES SEITER

PowerAgent 1.1

Task-Automation Software

PROS: Easy script development; great management of FileMaker Pro. **CONS:** Difficult to implement scripting in many mainstream applications. **COMPANY:** SouthBeach Software Corporation (305/858-8416). **LIST PRICE:** $159.

MW ★★★★

HOW MANY HOURS PER DAY DOES your Mac actually need you? Do you ever find yourself sitting in front of the screen waiting for a database update to download? Are you simply babysitting your Mac while it grinds through mail merges? With PowerAgent, a little glimpse of the future of Macintosh computing, all the boring, time-consuming stuff can be automated and performed at off-peak times.

PowerAgent is simple enough that even someone with no programming background can use it for basic tasks. The program opens with a blank job list (see "Just Another Job"). You click on the Job Card icon to get a choice of action flags to set: Date and Time, Start Up, Shut Down, Check Data, and Apple Event. Start Up, for example, is the flag to pick if you want an action to be carried out every time your Mac starts up. Date and Time can be set for one-shot or every-Tuesday-at-10-a.m. actions. Then you pick a task from another set of five possibilities: Alert Message (you can send alert messages to a whole network), Print Message, Send Mail, Run FileMaker Pro Script, and Run AppleScript. The E-mail function currently works with CE Software's QuickMail and Apple's PowerTalk. In practical terms, this means that QuickMail is easy to use with PowerAgent, but for other E-mail programs you'll want to be on a network where a kindly system administrator has installed PowerTalk for you, along with a PowerTalk-capable E-mail system.

The AppleScript and FileMaker Pro script functions are the real payoff in PowerAgent. It's nice to be able to send yourself alerts and to print message files at night, but it's not crucial. The FileMaker Pro script function, however, really makes a difference, mainly because FileMaker scripting is easy enough that people can actually use it. All the normal database tedium—printing 500 mail merge letters, checking mailing lists for duplications, updating inventory, generating standard weekly reports—becomes

continues

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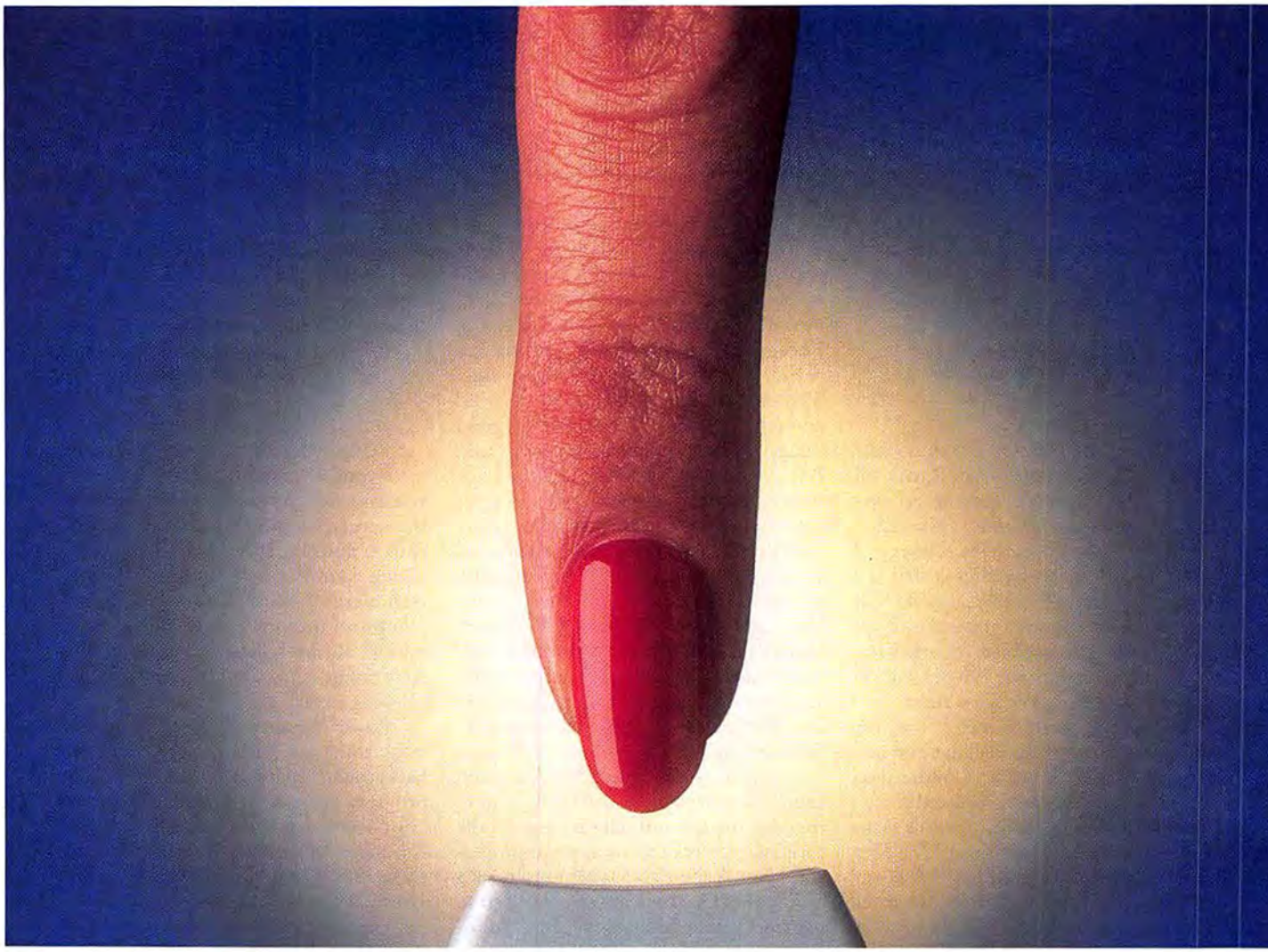

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a matter of recording the script in FileMaker and then telling PowerAgent when you want it done. There's no real programming involved, and PowerAgent becomes a sort of programmable timer for your FileMaker operations.

The AppleScript function (PowerAgent has a wonderful dialog-box–based scriptwriter) in principle lets you have the same kind of control over dozens of other applications. The snag in this arrangement is that not enough script development has been done at the applications level. FileMaker Pro figures prominently in the PowerAgent manual not just because it's the most popular Maintosh database but because scripting FileMaker Pro is relatively easy. You could also write AppleScripts that run tasks in Microsoft Excel, but you'll be on your own figuring out how to do it—even the Excel 5 manual has nothing to say about AppleScript. PowerAgent lists other script-capable applications, among them QuarkXPress and Aldus PageMaker, but you can expect to put in some long hours with Derrick Schneider's *The Tao of AppleScript* (Hayden, 1993) before you can make this happen. In PageMaker, for example, you have to use AppleScript to issue the commands of PageMaker's own internal scripting language. That's a job best left to a programmer who will be developing scripts for companywide use. It's not SouthBeach Software's fault that the rest of the world isn't as script-hip as it should be, but the situation at present limits PowerAgent's value. Still, the idea of an agent program that manages scripts is extremely powerful, and SouthBeach Software can expect PowerAgent to be a hot item as more applications put AppleScript to work.

The Last Word If you're not scared of scripting, you can revolutionize your Macintosh work with PowerAgent. Support for automating FileMaker Pro functions is already superb, and PowerAgent will be able to handle other applications equally well once scripting gains wider acceptance.—CHARLES SEITER

Just Another Job The Job List, just a list of tasks to automate, is the source of PowerAgent's power and relative simplicity.

White Knight 12.0

Telecommunications Software

PROS: Solid performance; rich feature set.
CONS: Steep learning curve; quirky interface; lacks online help (except for scripting).
COMPANY: The FreeSoft Company (412/846-2700). **LIST PRICE:** $139.

MW ★★★★

SCOTT WATSON'S WHITE Knight 12.0 is the latest descendant of a telecommunications program that dates back to the earliest days of the Mac. What began as a shareware program called Red Ryder, over the years became commercial, got a name change, and was revised many times. But the numerous updates have not changed the program's focus as an all-in-one telecommunications application. While other programs have become fatter and slower, and have acquired Windows-style shaded menus, Watson's vision of the ideal telecommunications software remains sharp and true. White Knight offers just about every telecommunications feature you need and likely have ever imagined, including one or two that are unique to the program.

Still, in the finest Mac programs you can open the application and figure out the basics with a minimum of fuss. White Knight is not such a program. Watson tells you in the beginning of the manual that he expects you to sit down and read it, thoroughly, before using White Knight. And you should definitely take him at his word.

In these days of Windows-like tool bars and buttons, White Knight has maintained its plain but cluttered interface (and its minimalism—the 680X0 and Power Macintosh versions each ship on one 800K disk). You work in a single application window with a bewildering array of menus and submenus. The basics, such as logging on to a BBS or an online service, are relatively easy. But the program's more advanced features, including its flexible scripting capability and multitude of terminal-emulation choices (from TTY to Televideo), are another matter. The online help deals only with scripting, and without the manual you can get lost in cyberspace real fast. Fortunately, the manual is written in an easy-to-read, friendly style.

Despite the sometimes awkward interface and strange, multicharacter keyboard shortcuts (such as ⌘-M-H to hang up your modem), White Knight works impressively well. The native Power Macintosh version, for example, seems to execute steps in the blink of an eye.

Making connections through White Knight is fast and reliable. The program supports all the popular file-transfer protocols, including Xmodem, Ymodem, and Zmodem, as well as more-arcane protocols like Classic Kermit, Long Packet Kermit, Sliding Windows Kermit, and CompuServe Quick B. White Knight also offers a proprietary transfer scheme called Flash. You can use Flash only to connect to other systems using White Knight, but in my tests, Flash provided more consistent performance and better transfer speeds than other telecom products.

White Knight's powerful scripting language allows you to automate every part of your connection routine, from simple log-ons to file and message transfers. Writing a script (which White Knight calls a "procedure") takes practice, and a big chunk of the manual is devoted to describing how it's done. But you don't have to write a procedure from scratch; the program can do it for you by recording your actions (somewhat the way a macro program does).

Telecommunications Center Most of your work in White Knight is done in the main application window. Here, we've logged on to the support BBS for White Knight.

You can store all of your connection scripts in a handy phone book. White Knight's phone-book window mimics a printed address book, even providing a virtual slider for selecting entries stored under a specific letter of the alphabet.

The Last Word
White Knight is an acquired taste, to be sure. If you want the ultimate in ease of use, you may be better off with Aladdin Systems' SITComm or Software Ventures' MicroPhone. But if you are willing to read the manual from cover to cover—and learn how to use the extraordinarily wide range of features White Knight has to offer, as well as its sophisticated scripting—it may well become your favorite telecommunications tool.
—GENE STEINBERG

ClickBook 1.1

Print Utility

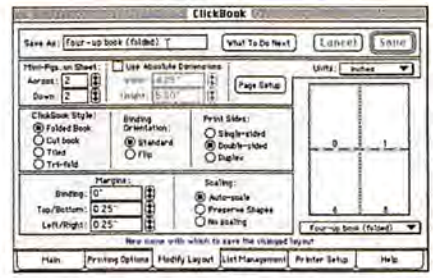
PROS: Nearly foolproof pagination; easy to configure; good online help. **CONS:** Scaled graphics and fonts can be distorted. **COMPANY:** BookMaker Corporation (415/354-8161).
LIST PRICE: $69.95.

MW ★★★

SO YOU WANT TO BE A PUBLISHER? BookMaker's ClickBook might take you one step closer to your Rupert Murdoch fantasies. ClickBook is a print utility that helps you format documents into double-sided booklet form, and automates the rather arcane process of pagination. The program comes with 20 preconfigured booklet types and allows you to create more layouts as you need them. The layout tools aren't fancy, but then again, ClickBook isn't aiming to be QuarkXPress.

Creating a booklet in ClickBook is easy. First you open a document (in almost any text or graphics application) and choose Page Setup from the File menu; then you check a box to make ClickBook active. Finally, you print the document using the standard Macintosh print command. Instead of sending the pages to the printer, ClickBook captures them in a buffer and then allows you to select a booklet type. The program arranges the document pages so that they are printed in a smaller format, and they come out of your printer as page signatures: single sheets with multiple minipages printed on them.

While ClickBook makes it easy to print your documents as minipages, you'll need to practice a little to get those pages to look right. Some of the layouts reduce the page size and the margins quite a bit—enough so that you will need to use a fairly large type size for it to still be legible after being reduced. You'll also need to experiment with the margins to get the pages to print correctly.



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ClickBook booklets are no substitute for professionally printed books, manuals, or brochures. ClickBook doesn't use a page-description language such as PostScript to preserve letters and graphics. When it scales pages down, there can be a slight loss in image quality; gradients and gray-scale drawings suffer the greatest degradation.

To reduce the distortion that scaling causes, ClickBook has options that let you preserve graphic and text shapes. You can also choose a no-scaling option and do the necessary scaling manually in the document's original application.

The Last Word Overall, most people will be satisfied with the quality of ClickBook's booklets. With just a little practice, I created address books, shareware manuals, and minibooks of poetry of variable length using such applications as Microsoft Word, No Hands Software's Common Ground, and QuarkXPress. For small businesses or individuals who need to create inexpensive booklets quickly and without hassle, ClickBook is an excellent choice.—MATTHEW HAWN

PowerPort Mercury/PB 500 Series

Fax Modem

PROS: Solid performance; excellent fax software; capable telecommunicatcns program. **CONS:** Difficult installation; fax software doesn't support gray-scale images. **COMPANY:** Global Village Communication (415/390-8200).
LIST PRICE: $399.

MW ★★★★

AT THE MOMENT, IF YOU WANT to install an internal fax modem on your 500-series PowerBook, you have one choice—Global Village Communication's PowerPort Mercury. Fortunately, the PowerPort Mercury is a top-notch product capable of exemplary fax and data-communications performance.

If you decide to purchase this fax modem, you may want to get a PowerBook bundled with it. The design of the PowerBook 500 series makes modem installation a job you should not take lightly. The installation guide for the modem is 32 pages long and lists 68 steps that involve complete disassembly and reassembly of the computer.

Global Village's GlobalFax software is a work of elegance. You can configure, view, and print faxes from within the Fax Center desk accessory (which uses just 20K of RAM). You can have faxes print automatically by setting the Print Fax option and leaving Fax Center open. As soon as your fax is received, the printing process begins. You can send faxes from within most applications by holding down the option key and selecting Fax from the File menu. The Fax window also lets you select an address book, search for individual names, or add new names. You can choose from a list of options for your faxes, such as whether to send a fax in standard or best quality, whether to include a cover page, and whether to fax the document now or at a scheduled time. You can also assemble separate fax documents and send them in a single operation.

Making It Easy Global Village's Fax Center desk accessory is your command center for fax chores.

For general-purpose telecommunications, Global Village provides a licensed version of the shareware favorite ZTerm (you don't have to pay a shareware fee). For logging on to a bulletin board or online service, ZTerm is fast and easy to use. The program has a limited script-creation capability, and it transfers files at top speed using the Zmodem protocol. You can also use ZTerm to set up address books for your most frequent BBS visits.

The PowerPort Mercury's performance is virtually flawless. It sends and receives faxes quickly, and the quality is superb. However, the PowerPort software (version 2.08b) doesn't support gray-scale faxes. When I used the PowerPort Mercury as a data modem, I was able to connect to all of my favorite online haunts without any problems. The PowerPort Mercury supports V.terbo (a subset of the V.32bis standard), providing a data-transfer rate of up to 19.2 Kbps. I was able to locate only one source—Global Village's own BBS—that supports that speed, but I had no difficulty achieving reliable 19.2-Kbps connections there.

The Last Word All told, the PowerPort Mercury fax modem is a first-rate product. I recommend it without hesitation.
—GENE STEINBERG

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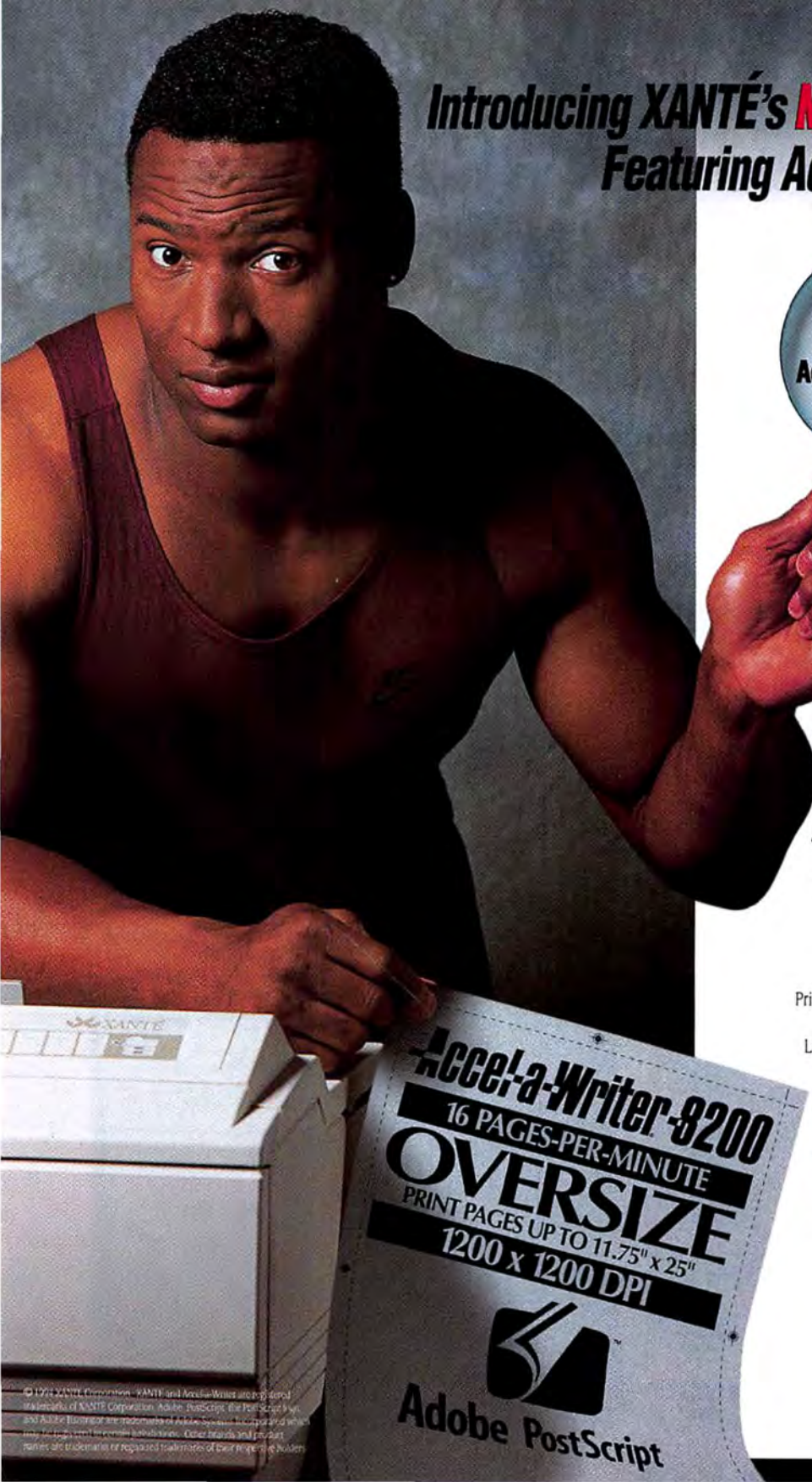

By now, you realize there are other high-resolution laser printer manufacturers in the main stream, but chances are, you don't know if they offer *genuine* ***Adobe™ PostScript™***. Well, just for the record, *Bo knows!*

Only XANTÉ® offers Adobe PostScript on a large format, high-resolution laser printer. And, since true PostScript guarantees high performance, incredible print quality, and software compatibility - you know it's the only choice!

You can purchase the Accel-a-Writer 8200 with 600 x 600, 800 x 800, or even 1200 x 1200 dpi – it's your call. Halftones, fine-line text, and graphics are phenomenal. And now, with oversized capabilities (up to 25"), you can print high-quality full-bleed newsletters, CAD drawings, spreadsheets, and more! XANTÉ's Accel-a-Writer 8200 is the new leader in affordable high-resolution printing. Accept no substitutes.

- ***Adobe PostScript Level 2***
  Guarantees superior quality, performance, and compatibility.
- ***High Resolution***
  600 x 600, 800 x 800, or 1200 x 1200 dpi.
  HP-GL® emulation offers up to 1200 x 1200 dpi.
- ***NEW Oversized Format***
  Print full-bleed 11" x 17" pages and custom size output up to 11.75" x 25".
- ***Simultaneous Macintosh®/PC Printing***
  LocalTalk®, serial and parallel interfacing. Ethernet is available.
- ***Faster Printing***
  Incredibly fast printing, up to 16 pages-per-minute.
  Faster processing with a 33 MHz AMD 29030 RISC Processor.
- ***Automatic Emulation Switching***
  Selects printer language between Adobe PostScript and HP PCL® 5.

So, before you buy a high-resolution laser printer, *look for the Adobe PostScript logo*, then call XANTÉ.

1-800-926-8839 ext. 2110
Fax 205-476-9421
MasterCard/Visa/American Express/Discover Card accepted.

XANTÉ
Innovations In Output

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Circle 111 on reader service card

Terrazzo 1.0

Plug-in Graphic-Effects Module

PROS: Fast; easy to use; easy to adjust; can export and import tiles. **CONS:** No integrated 3-D bump or lighting effects. **COMPANY:** Xaos Tools (415/487-7000). **LIST PRICE:** $199.

MW ★★★

IN A CHAOTIC DIGITAL WORLD, XAOS Tools' Terrazzo is an oasis of order and symmetry. A yin-yang complement to Xaos's first Macintosh product, Paint Alchemy, Terazzo is a cool plug-in module that transparently places powerful mathematical algorithms into the hands of the digital artist. Using one of 17 planar-symmetry groups, Terrazzo creates intricate repeating tiles from any bitmapped image. It's rather like having an adjustable kaleidoscope on your desktop.

Terrazzo works within Adobe Photoshop, Fractal Design Painter, and other graphics programs that accept plug-in modules; it adds 1MB to the host application's RAM requirements. The filter's uncomplicated interface displays a thumbnail of the source image (either the one you are currently working with or a user-specified alternate) along with a motif—a variable marquee that bounds the area used in the pattern calculations. The symmetry groups, carrying fanciful descriptions such as Honey Bees and Prickly Pear (named after American quilting patterns), dictate how much rotation, offset, and mirroring Terrazzo will apply to the sample. Once you've chosen a symmetry group and set the motif, Terrazzo displays a sample tile. You can adjust feathering, opacity, and color channels before rendering the tile into a repeating pattern across the image. You can also save individual tiles as discrete images, for later use as a tiled fill, in Photoshop, or as a repeating texture map for 3-D models.

Terrazzo is fun to use, but it's not easy to control precisely, nor can you always predict your results. You can't always tell whether interesting Terrazzo tiles will make attractive repeating patterns. While it is possible to gain a basic sense of how Terrazzo's symmetry groups affect an image, experimentation and serendipity are still intrinsic parts of the tile-making process.

Beguiling as its geometric magic can be, Terrazzo lacks a few features that 3-D artists in particular might desire. Unlike Specular International's TextureScape, Terrazzo does not allow the user to apply three-dimensional effects, such as lights, bumps, or bevels, to the surface of the pattern. One workaround is to create gray-scale patterns and use them as separate bump maps. Artists using Terrazzo with Fractal Design Painter can define tiles as paper textures to produce interesting relief and lighting effects.

Tools for Tiling Terrazzo's simple interface provides interactive feedback as you adjust parameters to create a pleasing pattern.

The Last Word Turning a random group of pixels into a geometric pattern may not be everyone's consuming passion, but Terrazzo has definite appeal for a select niche of fabric, graphic, and video designers, as well as folks who just yearn for a little more balance and harmony in life.
—AVI HOFFER

PostScript Utilities

Imagesetter-Simulation Software

CheckPost 1.3

PROS: Good interface; background and batch downloading; can strip fonts from PostScript files. **CONS:** Can't automatically scale pages; prints on a single sheet; limited error reporting; can't print from applications; incompatible with non-Adobe PostScript interpreters. **COMPANY:** Working Software (408/423-5696). **LIST PRICE:** $249.95.

MW ★★

LaserCheck 1.0

PROS: Automatically scales pages; gives lots of job information; prints pages up to point of error. **CONS:** No on-screen interface; unreliable on/off toggle; incompatible with non-Adobe PostScript interpreters. **COMPANY:** Systems of Merritt (205/660-1240). **LIST PRICE:** $199.

MW ★★★★

IF YOU OUTPUT PAGES TO A PostScript imagesetter, you've no doubt experienced the frustration of getting back your paper or film with errors—wrong orientation, substituted fonts, cropped-off crop marks, and so on. The problem is, you generally can't use a laser printer to proof your imagesetter-destined PostScript output. The pages are too big, or they're rotated so you only see parts of them, or they don't print at all. CheckPost and LaserCheck address the problem, but neither works with non-Adobe PostScript interpreters; so clones need not apply.

LaserCheck LaserCheck is a file of PostScript code that you download to a printer (Adobe's SendPS downloader is included) to make it behave like an imagesetter. You can then print or download files destined for the imagesetter and get a representation of the pages as they will print on the film or paper roll, with each page automatically scaled to fit perfectly.

Around the edges of each page, LaserCheck provides a wealth of information on fonts, page orientation, PostScript operators used, screen and flatness settings, and processing time. If LaserCheck encounters a PostScript error, it prints what has already been imaged, along with a report of the error.

Once LaserCheck is resident in your printer, you can toggle its operation on and off, but this toggle program is not very reliable, so you often have to reset the printer to clear LaserCheck out.

CheckPost CheckPost provides the user interface that LaserCheck lacks. You can download a file using CheckPost (even in the background, via menus or drag and drop) and access its controls through menus and dialog boxes. You can see an on-screen report of fonts required by and included in a PostScript file, and you can remove any fonts, which speeds printing somewhat if the fonts are already on the imagesetter. But interface aside, CheckPost is a disappointment compared with LaserCheck.

CheckPost's Draft mode emulates various imagesetters, much as LaserCheck does, but doesn't automatically scale pages to paper size; you must manually specify scaling and orientation. And unless you download each page separately, CheckPost crams all the pages on one sheet—sometimes useful, but usually not.

CheckPost doesn't provide nearly as much information as LaserCheck, nor does it print the part of a page that's already been imaged when an error occurs. Finally, CheckPost requires you to create a PostScript dump and then download it; LaserCheck lets you print directly to a printer that has LaserCheck loaded.

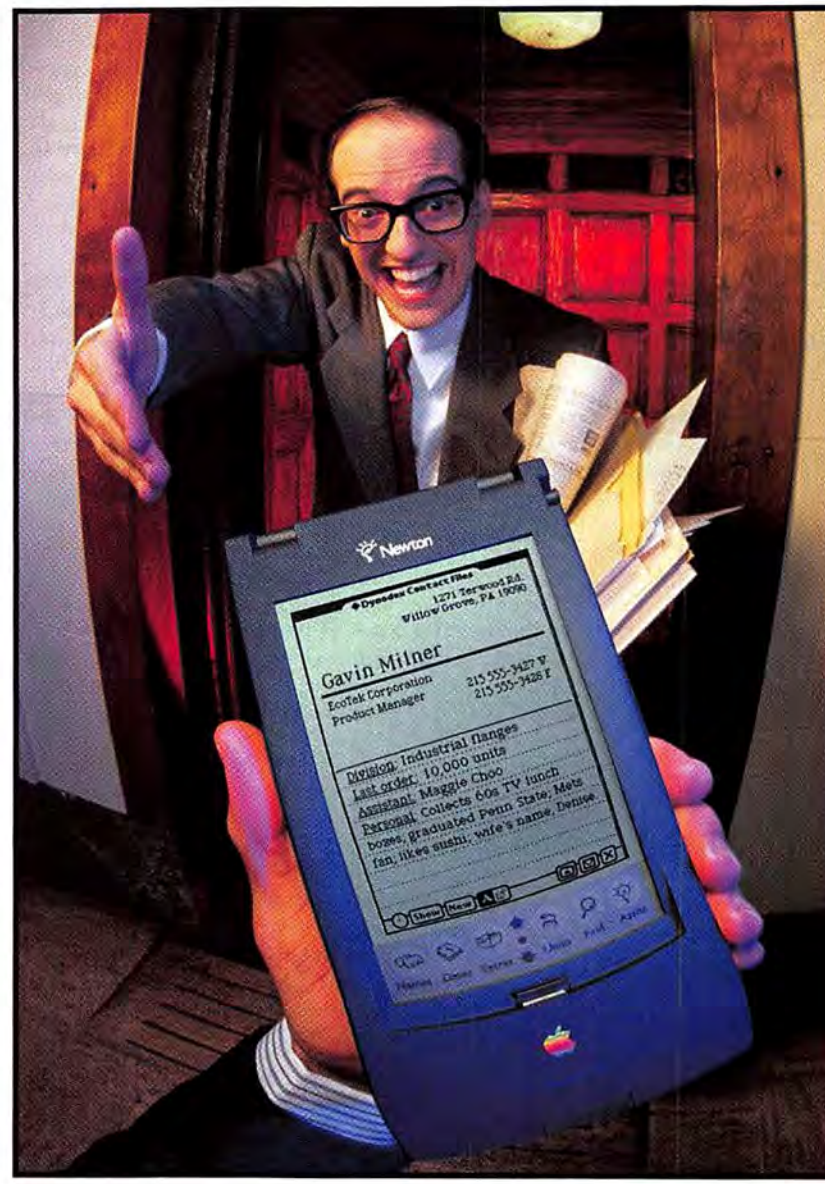
The Last Word Between CheckPost and LaserCheck, I'd choose LaserCheck hands down; in fact, I find it essential. The program can save you hundreds of dollars, and many hours, on a single, large imagesetting job.—STEVE ROTH

Newton connects. When you carry a MessagePad™ 110, the new Newton® communications assistant from Apple, you carry the power that comes from having information at your fingertips. Which means no matter where you go, you always have access to the facts you need, at the moment you need them.

With the Newton Connection Kit 2.0 for Macintosh,® you can exchange information with your Macintosh, as well as with a range of popular Mac® software, such as ACT! contact manager, Lotus 1-2-3, Excel and Microsoft Works.*

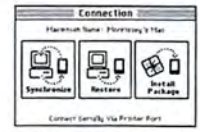
So now you can do things like reference sales leads from Dynodex and work with data created in Microsoft Word, all from the palm of your hand. And if you're working on a PC running Windows, the Newton Connection Kit 2.0 for Windows will allow you to easily do the same with all your current Windows applications.**

To find out more, call 800-365-3690, ext. 100, for the Newton dealer near you. Or check out an on-line service for the interactive demo found on the Newton forum.† Either way, you'll find that instead of giving you more technology, Newton gives you something you can really use: help.



Newton. It's there when you need it.

Newton connects to Windows. *With the Newton Connection Kit for Windows, you can easily exchange information with your Windows-equipped PC.*



Downloading, updating and backing up information between your Newton and your computer is as easy as plugging in.

Newton connects to Macintosh. *The Newton Connection Kit lets you work with your Macintosh via serial connection or your AppleTalk® network.*

*MacLinkPlus Library, a product of DataViz, Inc. **Available summer 1994. ConversionsPlus Library, a product of DataViz, Inc. †Look for the on-line Newton demonstration on the following services: AppleLink®, America Online, CompuServe and the Internet. In Canada, call 800-665-2775, ext. 900, for information. ©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleLink, AppleTalk, Mac, Macintosh and Newton are registered trademarks of Apple Computer, Inc. The lightbulb logo and MessagePad are trademarks of Apple Computer, Inc. ACT! is a registered trademark of Symantec Corporation. Dynodex is a registered trademark of Portfolio Software, Inc. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Microsoft is a registered trademark of Microsoft Corporation.*

The Multimedia Workshop 1.0

Multimedia Presentation Tool

PROS: Inexpensive; fun and easy to use; CD-ROM is packed with clip media. **CONS:** Lacks flexibility; does not create interactive presentations. **COMPANY:** Davidson & Associates (310/793-0600). **LIST PRICE:** $79.95.

MW ★★★

MOST MULTIMEDIA PROGRAMS cost hundreds of dollars and come with a long learning curve. The Multimedia Workshop is a different kind of media-integration tool—one that can be used by children or adults without a big investment of time or money. The Multimedia Workshop includes three authoring environments: the Paint Workshop, the Writing Workshop, and the Video Workshop.

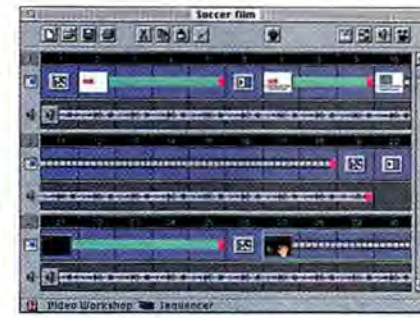
The Paint Workshop is a color paint program with all the basic painting tools, plus extras such as snowflake and tree tools. The Writing Workshop doesn't offer footnoting or an outliner, but it includes a spelling checker, a thesaurus, a read-aloud feature, and desktop publishing capabilities.

The heart of The Multimedia Workshop is the Video Workshop, which has a scene-generation module and a video-layout module. The scene-generation module allows you to place graphics, background templates, and QuickTime movies on the screen. Using the tool bar and menu commands, you might start with a background template of a picture frame, change the background color, type a title, and place a drawing in one corner and a movie in another. The screen shows what the scene will look like, except that the movie doesn't move.

You combine scenes in the video-layout module. The interface is similar to, but simpler than, the multitrack interface of Macromedia Director. By dragging icons and stretching bars on a time line, you arrange the order of scenes and change their durations. It's just as easy to add visual transitions between scenes and to place sounds in the audio track. When you play your production, the visual effects, video clips, and sound are synchronized according to your time line. If problems occur, you can easily go back to the Video Workshop and tweak the scenes and the time line.

The Multimedia Workshop is full of compromises: Each scene can contain only one movie. The time line lets you place cues only at one-second intervals. There's no sound editor. You can't layer narration over music (unless one is embedded in a movie). You can't create interactive presentations that respond to mouse-clicks.

The Last Word Still, it's hard to argue with satisfied customers. The adults and middle-school kids who tested The Multimedia Workshop for us produced eye-catching, snappy presentations in a few hours (including the time it took them to learn the program). They had a great time mining the CD-ROM full of clip art, music, and video for ideas and images, and they loved showing their masterpieces to anyone who passed by. For beginners, The Multimedia Workshop passes the screen test.
—GEORGE AND BEN BEEKMAN



Tracking the Action The blue track of the storyboard includes visual elements like pictures and movies; the gray track contains sounds.

Decision Analysis 2.5

Decision-Assistance Software

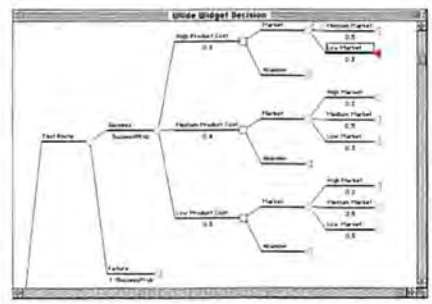
PROS: Straightforward visual approach; new options encourage realistic models. **CONS:** Needs spreadsheet-style summary. **COMPANY:** TreeAge (800/254-1911). **LIST PRICE:** $379.

MW ★★★★

TO UNDERSTAND WHAT DECISION Analysis from TreeAge (DATA) does, you have to understand the probability concept of *expectation value*. In California, for example, the state lottery pays out about $0.25 in prizes for every dollar in tickets. In a Nevada blackjack game, your expectation value is about $0.98 for every dollar you bet. The definition is as follows: expectation value equals payoff times the probability of the payoff. This is easy to follow in simple gambling cases, but it's not clear how to apply this concept correctly to complex, multistep business decisions.

DATA handles complex business cases by constructing tree diagrams of probabilities and payoffs, with a separate subtree representing each step of a process. Although probabilities in a process must sometimes be assigned subjectively, this procedure is the most realistic model available for the chances of success in a new project. If you need to know whether a million dollars invested in developing a new project will give you $2.3 million or $0.4 million as the likeliest payoff, DATA gives you a structure for employing whatever information you may have for sharpening your estimate of the expectation value. Pick New Tree from the File menu, choose Adding Branches from Display, fill in a few payoffs and probabilities, and you have a model. You can now ask for an Outline view of the information in your tree diagram.

Version 2.5 offers a generous list of improvements (TreeAge provides a manual supplement that's almost the size of the 2.0 manual). Sensitivity analysis now includes two-way sensitivity treatment and threshold analysis (essentially just a better way of handling ranges of payoff and expectation values). Different scenarios can now be studied with comparative graphs. A new node type (Markov) makes it possible to construct models of simplified time-dependent processes. Version 2.5 explicitly incorporates, under the Bayes's revision choice in the Options menu, the fact that you will often be modeling processes with incomplete data or with probabilities that will frequently be modified as the result of implementing your model and collecting results. Tree manipulation (copying subtrees, identifying lines, details of path analysis) has been improved, although trees in DATA still don't behave like true Macintosh graphical objects.



Up a Tree This DATA tree (and its subtrees) allows detailed analysis of the steps in a product marketing plan.

The Last Word If you have the responsibility for business decisions involving thousands of dollars and are willing to learn a new approach, DATA is the product for you. DATA offers a type of modeling that is more realistic and easier to modify than an Excel "what-if" study or a Crystal Ball analysis (see *Reviews*, *Macworld*, October 1994). DATA should be considered an essential part of a business analyst's tool kit.—CHARLES SEITER

SEE RED.

Design: Wheeler Design
Photography: Kory Addis

AGFA. FOTOTUNE. RED.

There's RED and there's RED. We see redheads and red fire engines and we paint the town red. And while a rose may be a rose, a red is not always a red. In the world of electronic publishing, this is doubly true. Scanners, monitors, and output devices define color in their own particular "languages" (called color spaces).

FotoTune is the solution. FotoTune, the Color Management System (CMS) from Agfa, takes those different color spaces and creates a "common language" called *ColorTag*. FotoTune insures color consistency throughout the workflow, from scanner to monitor to output device.

FotoTune. For all the ways of seeing red.

Find out how FotoTune can help you. Call 1.800.685.4271, extension Tune.

AGFA

SEE US AT SEYBOLD BOOTH #1201

Circle 90 on reader service card

SCSI-to-Ethernet Connectors

Network Hardware

DaynaPort Pocket SCSI/Link

PROS: Lightweight; can use ADB as power source; works with desktop Macs or PowerBooks. **CONS:** None. **COMPANY:** Dayna Communications (801/269-7200). **LIST PRICE:** 10BaseT $299; 10BaseT and thin Ethernet $369.

MW ★★★

Pocket EtherTalk Adapter

PROS: Lightweight; uses ADB as power source; works with desktop Macs or PowerBooks. **CONS:** Costs more than Dayna unit; long hold time for tech support. **COMPANY:** Xircom (818/878-7600). **LIST PRICE:** 10BaseT $349; 10BaseT and thin Ethernet $399.

MW ★★★

THE DAYNAPORT POCKET SCSI/LINK and the Xircom Pocket EtherTalk Adapter are lightweight, all-in-one SCSI-to-Ethernet connectors that work with both PowerBooks and desktop Macs that lack built-in Ethernet or NuBus expansion slots.

The garage-door-opener–size adapters have two SCSI ports that accommodate both DB-25 (found on desktop Macs) and HDI-30 (found on PowerBooks) SCSI connections; you can use only one port at a time. An HDI-30–to–DB-25 cable is provided to alleviate SCSI connection headaches. And setup is easy. A dial-style SCSI-termination selection switch facilitates placing the device anywhere on the SCSI chain. The adapters come preconfigured for a single device on your SCSI bus.

Except for price and tech support, both products are identical in form and function. They both transferred network information to my PowerBook with little effort. I attached one of the adapters to my PowerBook and moved the 10BaseT network connection from my desktop Mac over to the adapter. To use an adapter, you simply attach it to the PowerBook and attach the network connection from the desktop Mac to the PowerBook.

The device can be powered from either an external power supply or the Mac's ADB port. Use the ADB option sparingly, as it drains the PowerBook's battery and precludes the use of additional ADB-powered devices. This isn't such a big deal considering that most of the time, where there's Ethernet there's electricity as well.

PAUL BERG

Both products provide an Ethernet alternative driver that must be installed in the host Mac's System Folder. The driver reroutes the network traffic through the SCSI port. I experienced no compatibility problems and could log on to servers and print just as I had previously.

Dayna's tech support was quick, responsive, and accurate. After waiting on hold for Xircom nearly 30 minutes, I gave up. (Xircom and Dayna also provide support via fax and online services and on the Internet.)

The Last Word With its cheaper price and more-responsive tech support, Dayna wins in my book.—MATT CLARK

MicMac 2.0v1

Recording Software

PROS: Easy setup; relatively clean, crisp recordings. **CONS:** Uses lots of hard disk space; poor reproduction with highest compression settings; only partly compatible with AV Macs. **COMPANY:** Nirvana Research (408/459-9663). **LIST PRICE:** $89.

MW ★★★

MICMAC TURNS YOUR MACINTOSH into a portable tape recorder or transcription device. Instead of recording sounds onto a cassette tape, MicMac records sounds onto a disk file. The size of the file depends on the level of compression you select—6:1, 3:1, or none—and, if you have a newer Mac that supports CD-quality sound, which sampling rate you select.

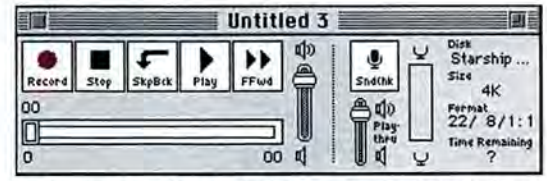
There is no manual, but the program includes a complete online tutorial, and you should be up to speed on this program in a few minutes. The main interface consists of a single window that mimics a tape recorder's control panel. You can use your Mac's microphone to record, or use a tape recorder or another Mac as your input source. If you make a mistake, the program's trim function allows you to replace all or part of your recording.

MicMac can run in the background, while you are working on another project (for example, typing the transcript of a recording into a word processing program). You can start and stop playback using keyboard commands, skip back to hear a segment over and over again, and mark spots for quick retrieval.

For most purposes, MicMac works comfortably within its less than 400K memory allotment. But when I attempted to record at a 44kHz, 16-bit sampling rate (CD quality) on my PowerBook 540c, the program put up a warning message requesting that I allot a larger RAM partition to the program. I gave it 800K and had no further problem.

At the highest-quality audio setting, sound reproduction was crisp and clean, but my hard drive filled up rapidly. Nirvana Research estimates that an hour of recording at MicMac's standard setting (22kHz, 8 bits, 6:1 compression) uses 13MB of hard disk space. I found audio quality at this setting barely acceptable (lots of hiss and some distortion), and I settled on the 3:1 compression rate (which uses twice as much disk space) as a listenable alternative (although it was not as crisp and clean as the higher-resolution settings).

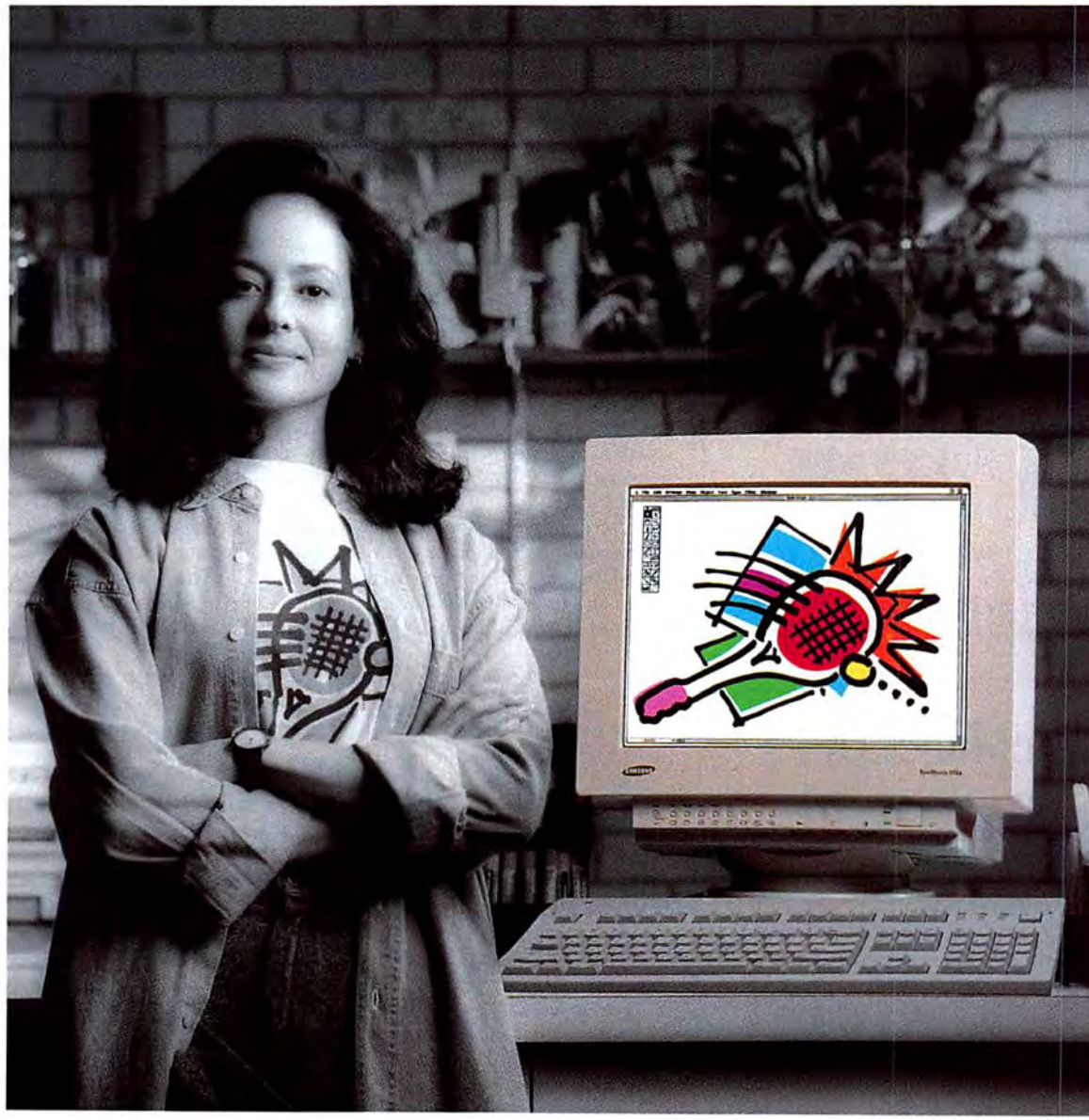
A high-density floppy disk can contain only a 3-minute MicMac recording made at an acceptable quality level. A full hour's recording requires a removable disk of some sort—if you intend to archive your recordings, the cost quickly adds up. According to Nirvana, version 2.1 of MicMac will allow you to record at one resolution and play back at a lower resolution, which, the company claims, will allow you to get a superior-quality recording and reduce file size.



Just Press Record MicMac lets you record and play back your recordings with a single button or via a keyboard command.

The Last Word The concept of Mac-as–dictation machine is undeniably attractive, and Nirvana Research has pulled it off well. But when all is said and done, a minicassette tape recorder provides equal or superior sound reproduction and is easier and more flexible to use for recording than a PowerBook. The choice is yours.
—GENE STEINBERG

Samsung.
Mac's new point of view.



SyncMaster 17GLs

It's about how you work on your Mac. Attitude. Satisfaction. Pride. Samsung designed the SyncMaster™ GL Series to be an extension of your creativity.

Whether you design on a Quadra workstation, create multimedia presentations on a Power Macintosh or need external video for your PowerBook, the SyncMaster GL Series will improve the way you view your work.

SyncMaster	14GL	15GL	17GL	17GLs
CRT Size	14"	15"	17"	17"
Dot Pitch	.28	.26	.28	.26
Maximum Resolution	1024 x 768	1024 x 768	1024 x 768	1152 x 870
Maximum Refresh Rate at Maximum Res. (Hz)	75	75	75	75
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

†1994 Samsung Electronics America Inc. Image on SyncMaster 17GLs courtesy of Mike Quon Design Office. Adaptor required for Macintosh Compatibility. Macintosh is a registered trademark and PowerBook, Power Macintosh, and Quadra are trademarks of Apple Computer, Inc.

With true 24-bit color, multiple on-the-fly resolutions and on-board color control, you can easily concentrate on what you're doing – not on what's running it.

Think about how you work on your Mac. Samsung did. And came up with a whole new point of view. For more information, give us a call at 1-800-933-4110.

TECHNOLOGY THAT WORKS FOR LIFE

SAMSUNG ELECTRONICS

Circle 198 on reader service card

MATLAB 4.1

Numerical Math Software

PROS: Complete and consistent program for numerics, with optimized matrix operations; extensive set of toolboxes. **CONS:** Adding toolboxes gets costly. **COMPANY:** The Math Works (508/653-1415). **LIST PRICE:** $1695.

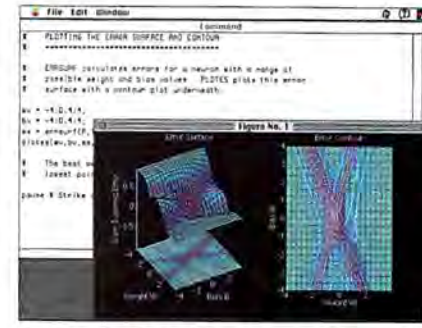
MW ★★★★

MATLAB IS THE PRINCIPAL NUMERical math system for matrix computation on platforms ranging from DOS PCs up to scientific superminicomputers. The big news in version 4.0 and higher of MATLAB is the addition, at last, of two features that have been needed for years. First, MATLAB has done an excellent job of implementing 3-D color graphics, making it the last major piece of scientific software to offer this capability. Second, The Math Works has finally introduced a proper debugging facility for M-files, the command scripts that are the basis of most MATLAB operations.

MATLAB's language is like an interpreted version of C, so it's relatively simple to implement a toolbox—a toolbox is just a set of M-file scripts and some new function definitions. Image processing, statistics, and electrical engineering toolboxes (control, signal processing, system identification) all appeared shortly after the first release of MATLAB. I looked at two new ones: the Symbolic Math Toolbox ($595) and the Neural Network Toolbox 2.0 ($895).

A Neural Network Toolbox is a natural for MATLAB, since every neural-net model is implemented as a matrix computation. Version 2.0 includes a whole megabyte of M-files (in highly compact format at that). The set covers backpropagation; perceptron learning; delta rule nets; Kohonen and Hebbian association; Hopfield recurrent networks; and nine detailed applications, including character recognition. The 400-page manual is one of the best textbooks on the subject I've seen yet.

The Symbolic Math Toolbox, instead of being yet another element in the endless repertoire of matrix computations, is a significant departure for MATLAB. Actually, it's Maple, appearing as a new set of MATLAB commands. The Math Works licensed Maple code from Waterloo Maple Software and packaged it as a standard symbolic-math toolbox and an $895 Extended Toolbox. The standard toolbox has about 60 Maple functions, including the linear algebra and ordinary differential equations sets, while the extended toolbox is essentially the full Maple package, including programming capabilities. The speed of Maple functions inside MATLAB is impressive, since MATLAB just calls Maple through its MEX gateway, and MATLAB doesn't impose much overhead of its own, being a simple command-oriented system.



Surfing the Net MATLAB's new 3-D graphics are used here to display neural-net-training progress.

The Last Word Besides offering nearly 100 new graphics commands—which give precise control over lighting, shading, and other display features—MATLAB 4.1 has improved its treatment of sparse matrices and has added commands for sound processing. MATLAB is relatively expensive, and it's not very Mac-like even in this incarnation, but MATLAB's toolboxes make it a first choice over a large range of engineering and applied-science specialties.
—CHARLES SEITER

PhotoMatic 1.01

Photoshop Utility

PROS: Automates repetitive Photoshop functions; allows batch processing of images. **CONS:** Inconsistent performance; accessing scripts in Photoshop is awkward; no way to pause a script. **COMPANY:** DayStar Digital (404/967-2077). **COMPANY'S ESTIMATED PRICE:** $199.

MW ★★★

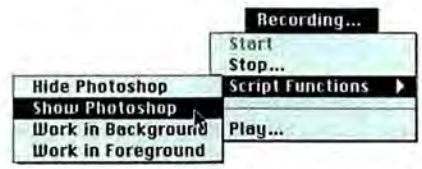
PHOTOMATIC IS AN APPLESCRIPT-based utility that lets you automate tasks in Adobe Photoshop (version 2.5.1 or later) without messing with AppleScript programming or a complex macro program. With PhotoMatic, you record a series of Photoshop commands and then use the resulting script to automatically process images.

Many Photoshop tasks *can't* be automated; tweaking an image generally requires an artist's eye. But for certain repetitive tasks, a scripting utility makes sense. For example, suppose you frequently change scanned images from RGB to CMYK and set their resolution to 166 dpi. You can easily set up a PhotoMatic script that steps through these processes automatically, saving you from the drudgery of repeatedly choosing the same commands. And because PhotoMatic can trigger these steps in the background, without opening Photoshop windows, jobs like this go a lot faster.

PhotoMatic places a Record menu in Photoshop's menu bar. To create a script, you choose Start, and PhotoMatic records your actions. When you're done, you choose Stop, and PhotoMatic then asks you to name and save the script.

You can play scripts from within Photoshop by choosing Play and opening the desired script. Unfortunately, there's no way to add frequently used scripts directly to the Record menu. (DayStar plans to add this feature in version 2.0, which should be available by the time you read this.)

PhotoMatic's real strength, though, is its ability to play scripts with Photoshop in the background and to batch-process files—performing scripts on an unlimited number of images. For batch processing, you drag the image-file icons onto the PhotoMatic icon. A dialog box appears asking which script to use. Pick the script and PhotoMatic launches Photoshop, makes duplicate copies of the images, processes them, and places them in a Done folder. You can also create folders, each containing multiple files and a script, and have PhotoMatic process each folder using the script within it.



Script Making You can set scripts to run in the foreground or background and with Photoshop windows hidden or displayed.

PhotoMatic also lets you use a remote copy of Photoshop over a network. PhotoMatic does the processing, then returns the final, processed images to your Mac.

Version 1.0 has deficiencies that limit PhotoMatic's practicality. The most significant limitation is that you can't create a script that pauses. This means PhotoMatic can automate only tasks that require no user input during processing. DayStar is adding a pause/continue feature in version 2.0.

Also, like any macro program or scripting utility, PhotoMatic requires a lot of debugging. Recorded scripts don't always perform as expected, and working out a script's kinks can eat up much of the time you're supposed to be saving.

The Last Word PhotoMatic can save you time and relieve you of some mundane Photoshop tasks, but it's a little too awkward and limited. The good news is that DayStar has promised to add features in version 2.0 that will make it much more powerful and easy to use.—JOSEPH SCHORR

Mac Keyboard Deluxe

Keyboard

PROS: Smaller and lighter than Apple's Extended Keyboard; four ADB ports. **CONS:** No tactile feedback on caps lock key; fold-down feet grate on desktop. **COMPANY:** MicroSpeed (510/490-1403). **LIST PRICE:** $125.

MW ★★★★

IT'S A SAFE BET THAT MOST PEOPLE—even enlightened Macintosh buyers—don't give a second thought to the one piece of hardware they handle most often: the keyboard. That's a shame, considering that your choice of keyboard can largely determine whether your computing experience is safe, comfortable, and efficient. And while you shop, remember that Apple isn't the only choice when it comes to keyboards.

The Mac Keyboard Deluxe's key layout is identical to the Apple Extended Keyboard's, but the Deluxe's footprint is slightly more compact. While the Apple keyboard is only an inch deeper, the difference is noticeable on a small desk like mine. The MicroSpeed keyboard is also lighter than Apple's, but it feels every bit as solid. Although I didn't assess the keyboard's long-term durability, it should stand up to routine use. (MicroSpeed says the keyboard is resistant to spills, a claim I wasn't brave enough to test.) The Mac Keyboard Deluxe comes with a one-year limited warranty and includes an ADB cable.

Although the MicroSpeed's key placement is the same as Apple's, its key switches provide slightly more resistance to finger pressure. I grew accustomed to the new keys in just a few hours; after that, the difference no longer mattered to me. My wife, Debbie, who rarely uses the Mac, said she was less likely to make typing errors with the MicroSpeed keys. (In general, I've found there's no right or wrong when it comes to key feel—the only way to tell if you like a particular design is to try it.)

The Mac Keyboard Deluxe includes four ADB ports (two more than Apple's keyboard), two of which are located at the back—useful if you like to have several ADB devices plugged in at the same time.

Unlike Apple's caps lock key, which clicks and recesses slightly when pressed, the caps lock key on the MicroSpeed keyboard provides no tactile feedback to tell you it's active. (An LED indicator next to the power key glows to show that caps lock is on, however.)

MicroSpeed's keyboard incorporates fold-down feet at the rear that provide three different tilt positions. My only complaint about the feet: the plastic tabs covering them make an annoying grating sound when they rub against the desktop—rubberized feet would be better.

The Last Word Minor gripes aside, MicroSpeed's Mac Keyboard Deluxe is well worth considering if you're in the market for a new or replacement keyboard for your Mac.—FRANKLIN N. TESSLER

RICHARD RETHEMEYER

Maxima 3.0

RAM Disk

PROS: Provides a higher-performance RAM disk and allows more Mac models to use a RAM disk than does Apple's software. **CONS:** Doesn't work with accelerated 68000-based Macs. **COMPANY:** Connectix (415/571-5100). **LIST PRICE:** $99.

MW ★★★★

RAM DISKS ARE CREATED BY A PROgram that tricks your Mac into thinking that part of its RAM is a disk volume, which shows up on your desktop just like any other disk. A RAM disk, however, operates at silicon speeds, much faster than any hard drive or floppy disk. For PowerBook owners, having the system software in a RAM disk can greatly reduce the amount of time the PowerBook hard disk is spinning, significantly boosting battery life. With the introduction of System 7, Apple built its own RAM disk software into the Memory control panel. A Maxima RAM disk has several improvements over the Apple version. First, the RAM disk created by Maxima is nonvolatile, meaning the contents of the RAM disk are automatically backed up onto your hard drive and will survive a reboot. You can also set Maxima to write-through mode, which saves to both the RAM disk and the hard disk on every Save operation. With the Apple RAM disk software, rebooting the Mac gives you a fresh, blank RAM disk. Second, Maxima uses memory-compression technology borrowed from Connectix's RAM Doubler program to double the size of the RAM disk created by Maxima. Maxima's installer copies the user-selected System Folder or applications to the RAM disk automatically. Finally, Maxima works with several older Macs that do not support Apple's RAM disk, such as the IIx and IIcx. Maxima runs under native mode on the Power Macintoshes.

Maxima's limitations are few but significant (and listed in the manual). Maxima won't work with a Mac Plus, SE, or Classic, even with an accelerator card. Only files that are limited by disk speed and not processor speed will have significant speed gains. For example, finding and sorting data in a FileMaker Pro database will be faster; but it won't speed up 3-D rendering, which depends on processor speed.

Maxima has an Easy Install option that scans your hard drive to check the size of your System Folder and your applications. It then lists all the found applications in a dialog box and asks which applications you use the most. If your System Folder is small enough to fit in the RAM disk, Maxima copies the folder to the RAM disk and makes the RAM disk the start-up disk. The next time you boot, start-up is quicker because the system software is held in RAM. If the System Folder won't fit on the RAM disk, Maxima allows you to place the most important components (System, Finder, and a few other files) in a System Folder on the RAM disk, then use aliases for things, like the Fonts folder. Maxima takes care of creating the stripped-down System Folder, but you must create the aliases to items within the System Folder and copy the aliases to the RAM disk. If there isn't space on the RAM disk for even a stripped-down System Folder, Easy Install uses the application choices you made and places as many of your frequently used applications on the RAM disk as will fit.

Connectix recommends 8MB of RAM to use Maxima, and I agree (the minimum required is 4MB). With less than 8MB of RAM, you don't have enough RAM for the RAM disk. With more than 8MB, you can allocate 4MB of RAM to the RAM disk (Maxima increases that to an 8MB RAM disk) and still have sufficient RAM to avoid out-of-memory messages.

The Last Word If you have lots of RAM (more than 8MB) and want to use some of it to speed up disk-based operations, Maxima offers an inexpensive, painless way to accomplish that goal.—TOM NEGRINO

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DESKTOP VIDEOCONFERENCING

by Matthew Leeds

WHAT IS THE INFORMATION SUPERHIGHWAY BUT A STATIONARY FORM OF TRANSPORTATION? INSTEAD OF MOVING BAGS OF CASH AROUND IN ARMORED TRUCKS, BANKS CAN CONDUCT THEIR BUSINESS BY TRANSMITTING ELECTRONIC MESSAGES DESCRIBING HOW MUCH money they've agreed to exchange. Instead of hauling newspapers out to coin boxes and corner drops in far-flung suburbs, publishers can post the news on a dial-in bulletin board. And instead of sending you to that urgent meeting across the country—where you arrive hoarse and bleary from the Thursday-night red-eye, wearing a rumpled suit and suffering from an airplane-seat crick in your neck—your employer can spend the airfare on a videoconferencing system that projects your smiling face and confident voice into the meeting from the comfort of your own office.

WITH THE RIGHT SYSTEM, YOU CAN BE IN TWO PLACES AT ONE TIME

Only a few years ago the technology for videoconferencing cost $100,000 or more, filled a room, and required satellite hookups or expensive leased data lines. Now better compression, miniaturization, faster processors, and a market expanding as fast as business travel costs climb—plus the falling price and wider availability of digital telephone lines—are bringing desktop videoconferencing, or DVC, within reach of large and small businesses alike.

However, testing here at Macworld Lab reveals that while DVC in its current state can serve a purpose, it is not going to put the airlines out of business any time soon. DVC systems are difficult to configure and get running, they provide marginally useful video quality, and they often have audio quality worse than that of a cheap speakerphone. Not only that, but despite diligent work by the international standards committees, each vendor's system can communicate only with others of the same brand, which means that you can count on videoconferencing only with members of your own organization or others who agree to install the same product your office uses.

We looked at the four videoconferencing systems currently available for the Mac: Cameo Personal Video System from Compression Labs, Connect 918 from NUTS Technologies, ShareView 3000 from Creative Labs (formerly ShareVision), and Visit Video from Northern Telecom.

We tested them between Macworld Lab and remote sites over standard analog phone lines (which most people in the telecom industry call POTS, for plain old telephone service) and over Integrated Services Digital Network, or ISDN; within the Lab we tested over Ethernet. Some videoconferencing systems support only

ABRAMS / LACAGNINA

one of those transport methods; others support more than one. While POTS is ubiquitous and Ethernet is easily obtained if your office doesn't have it already, we discovered that, even here at the headwaters of Silicon Valley, getting ISDN lines installed, configured, and functioning was anything but easy. (For the lowdown on high-tech ISDN, see "Living with ISDN.")

Desktop Pros and Cons

There are significant differences between traditional videoconferencing and DVC. Traditional systems are usually installed in rooms designed specifically for videoconferencing, with good acoustics and lighting, no distracting backgrounds, and equipment to suspend cameras and microphones where they can cover all participants. A large monitor and full-screen images make seeing all participants on the other end no problem. And these fancy systems often support multipoint conferences—the video equivalent of a conference call.

A DVC system is usually installed in the computer that sits on your desk. Your office was probably not designed as a conference room, probably has lousy acoustics, and probably doesn't have space for a group to gather around the camera—DVC systems are ill-suited for group use anyway. In addition, currently available DVC systems don't support multipoint conferencing. On the plus side, they are considerably cheaper than traditional systems, can transfer files, and have shared applications such as a multiuser whiteboard. And the information you need for your meeting is right at hand since your own computer doubles as the videoconferencing system.

What Makes DVC Tick

One of the basic components of a DVC system is its codec, the hardware that compresses and decompresses the video and audio data—similar to the way a modem converts digital data from your computer into sounds for transfer over phone lines. The codec can be a card that installs inside your Macintosh or it can be an external box. With some systems the codec also digitizes the audio and video before compressing it, while for other systems you need a separate digitizer.

In addition to a codec you get a camera and a microphone. Like a speakerphone, the microphone tends to pick up every sound in the room, including the telephone calls and conversations of colleagues in adjoining cubes. A lapel microphone, which you can buy separately, works much better than most of the supplied microphones; the ShareView system provides a headset with earphone and microphone to isolate ambient sound.

The camera you use may depend on your application. The supplied cameras all have a limited angle of view, and spotty support for close focusing and other important capabilities; but the Compression Labs and Creative Labs systems have auxiliary video inputs that make it easy to attach another camera or video source—handy if you're trying to show videotaped material or a small object.

Depending on which transport you are going to use, you may need an interface card. For example, to use ISDN as your transport, the Northern Telecom

TALKING HEADS

Videoconferencing image quality, as well as sound quality, varies widely between products due to the efficiency and integration of the compression algorithms they use, the efficiency of network use, and the raw processor speed.

These four mug shots were captured under ideal circumstances, with minimal motion and using dedicated communication lines. Note that each product divides access to its features between menu commands and a control panel that surrounds the video window (except ShareView, which uses a separate VCR-remote window; see "Couch Potato's Videoconference").

Compression Labs' Cameo This system uses a third-party video board with accelerated 24-bit color. It's not surprising that it produces the best color of the lot. Sound quality was also ranked highly.

NUTS Technologies' Connect 918 Over Ethernet running at 384K, the Connect image shows more posterization and more pixelization than either of the products we tested over ISDN. The high frame-rate setting may be partly responsible for the degraded image quality.

Creative Labs' ShareView 3000 Considering that we tested the 3000 over normal telephone lines (the only transport method it supports), producing even this muddy, indistinct image is quite a feat of engineering on Creative Labs' part—but could you live with it?

Northern Telecom's Visit Video This was the product that Macworld Lab's panel preferred, not just for its good video quality, but also because it overcomes the unpleasant speakerphone limitation of allowing only one person to speak at a time.

and NUTS systems supply the third-party Planet ISDN card. In addition to this card, we learned, we needed an NT-1 interface between the card and the ISDN line; the NT-1 performs several functions, including providing termination and power for the ISDN line. A switched 56 line, a digital wide area network similar to ISDN, would also require special interface hardware (we did not test switched 56). If we had been working with a reseller or system integrator, he or she would have known about all of the hardware pieces and would have provided them as part of a package at installation.

DVC's Enabling Software

All the products we tested provide a phone directory that stores commonly called numbers; have the ability to transfer files to the system on the other end; can take a snapshot of incoming video; and give you control over initiating conferences and other access issues. This last is designed to save you the embarrassment of suddenly realizing that someone has been watching your every move.

All four DVC systems provide a whiteboard feature, that is, a drawing application that allows participants at both ends of a conference to draw or scribble remarks on a shared blank screen. The data resides on only one machine; the other just receives an image of the data. So if both parties want to keep a copy of the whiteboard session, the host must transfer the finished drawing.

Some products support screen sharing, which differs from the whiteboard in that it lets you show your guests an open document in any application; some, but not all, DVC packages let the guest modify the remote document using its application's features. For programs that don't support this kind of sharing you must paste a screen capture into the whiteboard. Some products can record the video and/or the audio of your meeting session to disk.

ShareView 3000

The Creative Labs ShareView 3000 package includes two NuBus cards—one a combined codec and digitizer, the other a transport card that is essentially a fax modem (it comes with fax-modem software as well)—a color video camera; and a telephone handset and headset. The ShareView runs only on POTS—standard phone service—and the line attaches to the transport NuBus card along with the handset and headset. The camera attaches to the codec/digitizer card. This second card is thicker than a standard NuBus card; and on the Mac II, IIx, and IIfx it blocks the slot next to it.

The camera supplied with the ShareView 3000 is very small and light, and it's designed to sit on top of your monitor. Creative Labs includes a bracket for mounting the camera there, but we found the device virtually useless. The bracket's camera-angle adjustment would not lock correctly, and the camera gradually slipped out of alignment every time we tried to adjust it. In addition, the camera has a manual focus and manual iris, requiring you to get within arm's length to adjust them even though you'll normally sit farther away than that. This makes accurate focusing impossible without a second person to assist.

MARK JOHANN

The Eyes Have It Cameras supplied with videoconferencing systems (clockwise, starting at noon): Creative Labs' ShareView 3000; Northern Telecom's Visit Video; Compression Labs' Cameo Personal Video System; NUTS Technologies' Connect 918.

The ShareView's software provides a whiteboard, screen sharing, and file transfer, and can record video and audio to disk, take screen snapshots, and convert recordings to QuickTime.

ShareView does not save shared documents at the remote site, so you must remember to transfer a shared file after you're done with it. The remote site cannot use the menus of a shared application; guests share only the document. Floating tool palettes from the ShareView application itself don't appear on the guest's screen, but they can obscure portions of the shared document.

Connect 918

The NUTS Technologies Connect 918 package comes with a NuBus card, a camera that contains a microphone, and a speaker. There are different versions for ISDN and Ethernet, and Connect 918 does not include the necessary interface for ISDN. This means that to connect to ISDN you'll need to use a second slot in your Mac (as you will for Ethernet if your Mac lacks on-board Ethernet). Except for when you initially position the camera, which is no problem, the camera and speaker are hands-off: their controls are incorporated into the software.

The Connect software provides a phone directory, a log that records the duration and cost of calls, screen sharing, screen snapshot, file transfers, and a whiteboard. The Connect can display an inset of what your camera sees inside the window showing the participant at the other end—a feature called picture in picture—and can record a session and convert it to QuickTime. The guest has complete access to a shared application's commands and the contents of its windows. Shared documents are not saved at the remote site and must be transferred, but whiteboard documents are saved at both sites.

Cameo Personal Video System

The Cameo system is the only system we tested that may not require any slots in your Mac. Its codec is an external box, and if you have an AV Mac, the Cameo can use the AV's special hardware to digitize the video—and the audio if you need it. The Cameo can run over Ethernet at a maximum throughput of 56K using the AV Macs' built-in Ethernet, but unfortunately, when doing so the Cameo does not support audio. Since the Cameo doesn't tie up your phone line, you could pick up the telephone and call your colleague down the hall as you look at each other's face on-screen.

With a non-AV Macintosh you will need to add a video-digitizer card; for switched 56 or ISDN, you need the appropriate communications interface as well. The Cameo's optional camera is fixed-focus with an electronic iris and has a mounting bracket with an adhesive patch that makes for a very secure attachment. The codec connects to the Mac's serial port and to the video port on your video digitizer. The codec has an auxiliary video-input port that could support a camcorder or VCR.

The Cameo's software includes a diagnostic utility to test that your hard-

ware and software are properly installed and that the external codec is functioning correctly. The Cameo also provides the usual phone directory, picture in picture, screen snapshot, screen grabber, whiteboard, and file transfer. The video portion of a call stops during a file transfer.

Visit Video

The Northern Telecom Visit Video comes in many different configurations. There are gray-scale and color versions, and versions that support most transports. We tested the color version over ISDN. It comes with a NuBus video card that includes the color codec as a daughterboard, an ISDN card, and a camera. The camera perches on top of your monitor and has zoom, pan, and tilt controls in software. (You can substitute any NTSC device such as a camcorder or VCR, but the software controls work only with the Visit camera.)

A major difference in the Visit package is its ability to interface with some PBXs—not surprising, considering that Northern Telecom is one of the world's largest suppliers of digital telephone systems. In this kind of installation, the Visit can control your phone and your voice mail. You can dial with the mouse, keypad, or keyboard, or from the telephone-directory software. Call-information can be stored in a call log. All voice-mail options, including call forwarding, call parking, and conference calling, can be controlled from your Mac. (We did not test these features, but they could add considerable value if your telephone system supports their use.)

The Visit has the best phone directory of the lot, with elaborate features for managing entries. You can maintain multiple directories, sort directory entries, add custom fields to a directory, attach memos to directory entries, and perform searches on directories. The file-exchange feature runs in the background, allowing other functions such as the videoconference and the whiteboard to continue. Documents created in the whiteboard exist on only one machine and must be sent to the other machine if they are to be saved there.

With the Visit you can't share your applications' screens, but you can grab a screen and place it on the whiteboard for the other party to view. You can also open a text chat window.

Comparisons and Test Results

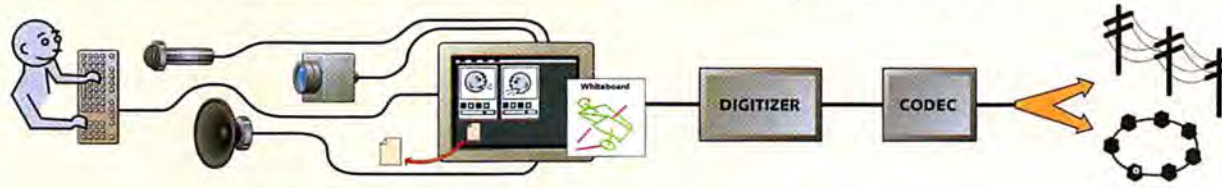
We assembled a panel of reviewers to look at each system running on Mac Centris 650s running System 7.1, with 14-inch monitors set to 16-bit color. The panel rated each system's video and audio quality from one to five, with five being the best and one the worst. The panelists rated the video based on distracting image-quality problems such as jerky motion, tearing (a broken or fragmented image indicating that the DVC system or the network is too slow to transmit a complete frame at the desired speed), pixelization (large, blocky groups of pixels that indicate where individual pixels have been combined), and posterization (a sharp reduction in the number of colors, which is a common technique for compressing an image). We planned to provide precise frame rates for each product under different circumstances, but we were not able to make accurate measurements of frame rates. In any case, it turned out that frame rate alone is not a major factor in the perceived quality of the video. We did note that none of the products was able to maintain an acceptable frame rate when there was a good deal of motion in the video image. This is not surprising: just as the system reduces the amount of data it must transmit by stripping out redundant color information to compress the image, it also strips out redundant location information by not resending parts of the image that haven't moved between frames; therefore, the more motion, the more information that must be sent for each frame.

We rated audio on sound quality and on synchronizaton between audio

Couch Potato's Videoconference ShareView's interface is designed to look like a VCR remote control; and unlike controls for the other three products, ShareView's are in a separate, movable window instead of in the same window as the videoconferencing image.

The Smart Shopper's Guide to Videoconferencing

Videoconferencing (VC) integrates hardware and software of several discrete computing systems. Until standards become widely accepted, make sure that all components in your system work together well. (Illustration shows only one side of a VC link.)



Input and Output
All Mac VC systems display talking heads on the Mac's monitor. For the microphone, camera, and speaker, they may use off-the-shelf, built-in, or custom components. Look for good components or the ability to substitute better ones.

Software
Good software is what makes a VC system worth using. Is it easy to look up a colleague's number and initiate a connection? Can the software transfer files and display spreadsheets or sketches? How sophisticated is its electronic whiteboard?

Digitizer
The digitizer (with codec) is VC's soft underbelly: digitizing multiple data streams in sync for real-time transmission is tricky. Some weak systems digitize with QuickTime, which was designed to digitize onto storage media and can't handle real-time synchronization.

Codec
A compressor/decompressor squeezes bulky data to fit narrow digital networks. As the digitizer sends it data, a well-designed codec strips away only the information—color depth, object edges, motion—that someone on the other end is least likely to notice.

Communication
Circumstances will determine your network type. Will you conference with others in your office? If so, Ethernet is your only choice. Will your conferencing go outside the office? If so, ISDN—if available at both sites—is superior to standard phone lines.

Desktop Videoconferencing Systems

System	Cameo Personal Video System	Connect 918	ShareView 3000	Visit Video
Price	Ethernet $1499[A]; ISDN $2500[A]	Ethernet $4299; ISDN $5899	POTS $3999	ISDN $5319[B]; POTS $4499[C]
Vendor	Compression Labs	NUTS Technologies	Creative Labs	Northern Telecom
Phone	408/435-3000	408/441-2166	408/428-0330	214/684-4206
Toll-free phone	○	○	800/998-5227	800/667-8437
Warranty	1 year	1 year	1 year	1 year parts, 90 days labor
Tech support	free (toll call)	free (toll call)	free (toll call)	free (toll-free call)
Transports PBX	POTS, switched 56, ISDN, Ethernet	ISDN, Ethernet	POTS	POTS, switched 56, ISDN, Meridian 1 PBX
Handset/headset	○/○	○/●[D]	●/●	○/○
Auxiliary video input	●	○	●	○
Camera controls	fixed focus, auto iris	manual focus, auto iris	manual focus and iris[E]	fixed focus, auto iris; zoom, pan, tilt in software
Software features				
Shared whiteboard	●	●	●	●
Transfer files	●	●	●[F]	●
Phone directory	●	●	●	●
Picture in picture[G]	●	●	○	○
Screen sharing[H]	○	●	●	○
Connection timer	○	●	○	●
Control frame rate	○	●	●	○
Control data rate	○	●	●	○
Record video to disk	○	●	●	○
Record audio to disk	○	●[I]	●	○
Screen snapshot	●	●	●	●
Security features				
Control session start	●	●	●	●
Control session recording	NA	●	●	NA
Pause (audio/video)	●/●	●/●	●/●	○/●
Control screen sharing	NA	●	○	NA
Control file transfers	●	●	○	●
Control snapshots	○	●	●	●

● = yes; ○ = no; ISDN = Integrated Services Digital Network; LAN = local area network; NA = not applicable; POTS = plain old telephone service. [A] Requires separate digitizer (except with AV Mac). [B] Includes NT-1 interface. [C] Modem not included. [D] Includes speaker and Jabra Earphone. [E] Includes mounting bracket. [F] Also transfer folders. [G] Local user appears as small inset in remote user's image. [H] View or control applications on remote Mac. [I] Not without video.

and video. Audio can get out of sync with video because it generally travels over a separate path. For example, the systems that use ISDN as a transport don't digitize and send audio and video together in a big lump: they send the two data types separately, using ISDN's multiple data channels. Videoconferencing systems generally require more time to digitize, compress, and decompress video than audio, and so the video may lag behind the audio.

We present the ratings as averaged totals of the video and audio scores; they represent a subjective evaluation of the audio and video quality of each system. We ran the Ethernet tests on a dedicated network with no other traffic. We ran the POTS tests on *Macworld*'s internal phone system, and they should be considered a best-case scenario. We ran the ISDN tests over newly installed ISDN lines provided by our local carrier.

CAMEO: tested over ISDN.
Rating: 4 The Compression Labs product got favorable marks from our reviewers. It requires a third-party video-digitizer, and the high-performance RasterOps 24STV is the recommended board. This board works in 24-bit mode, and we were able to test only in that mode. As a result, the Cameo's video looked a bit cleaner than that of the other products. The frame rate was only about 12 frames per second, but the audio sounded as good as a regular phone call. The user interface was also one of our favorites.

CONNECT 918: tested over Ethernet.
Rating: 1 The NUTS product lost points due to poor video and especially poor audio. Since the Connect 918 allows the user to set the frame rate, we experimented and found that the system gives the best results at around 15 fps. The video seemed to stutter at times when there was a lot of motion, yet appeared smooth at other times with the same amount of motion. One reviewer described the audio as "the worst phone connection ever heard," and we determined that clear audio is much more important than clear video for comfortable, efficient use of videoconferencing. We were also disappointed that the Connect system—even when set to transfer data at 384K, the maximum slice of an Ethernet's bandwidth it can use—performed worse than the ISDN products, which were limited to the two 64K channels we had installed. Finally, we found the phone directory difficult to understand and use.

SHAREVIEW 3000: tested over POTS.
Rating: 2 Like the NUTS product, Creative Labs' product lost points on video. Panelists complained about its low frame rate (about 7 fps), broken-up images, and lack of clarity. The standout comment

was that "the image quality couldn't be used in the real world." On the audio side, only one person could talk at a time, but the sound quality ranked about the same as a normal phone call. The low rating is mostly a function of the system's reliance on POTS as a transport, since it runs over 14.4-Kbps modems. In addition, the camera controls are difficult to use, the screen- and window-sharing features are confusing, file transfers stop the video image completely, and the whiteboard is difficult to use.

VISIT VIDEO: tested over ISDN.
Rating 4 The Northern Telecom product got very favorable marks from our panel. The overall image quality and audio quality were considered the best of the bunch. While there was some stutter or jerk in the image when there was a lot of motion, the Visit recovered faster than did any of the other products. The frame rate was about 12 fps. The audio uses full duplexing, which allows both parties to speak and hear at the same time. The software-controlled camera is a nice touch, though rarely used in practice. The software is missing some features, but this may be balanced by the voice-mail features that we did not evaluate.

LIVING WITH ISDN

Integrated Services Digital Network transmits digital data like an office network does, but is supposed to be as simple and ubiquitous as the telephone. ISDN, available in parts of this country, Europe, and Japan, is currently the only viable long-distance digital dial-up network, so to test videoconferencing products for this article we asked our local phone company to install ISDN at Macworld Lab in downtown San Francisco and at the home of a Lab technician. Our experiences suggest that ISDN can fit the bill—but don't expect it to be as easy to use as snapping a telephone into a modular jack.

ISDN's main disadvantage is spotty availability. We soon discovered that ISDN was not available in our technician's San Francisco neighborhood, forcing us to change plans and establish our remote site in Berkeley. Before investing in VC equipment, make sure ISDN is available at both ends.

ISDN provides two 64-Kbps B channels, which can be configured for both channels to carry data, or for one to carry data and the other voice; and a 16-Kbps D channel for control signals. (In some places ISDN can run 23 B channels in parallel for approximately 1.5-Mbps throughput.) An ISDN installation includes a network terminator, or NT1, which provides power for the ISDN line, terminates the line, and performs other low-level tasks; a terminal adapter, or TA, which sets up the digital connection to the exchange; and an ISDN board to interface to your Mac. Not all VC systems include these pieces, which can run about $800, so take their cost into account when comparison-shopping.

The phone company will charge about $400 to install your ISDN, about $50 a month to operate it, and, of course, extra for long-distance calls. Here's a hint if you plan to do long-distance videoconferencing: use the same long-distance carrier at both ends of your ISDN connection. This will simplify tech support a great deal.

Waiting for the Wire

Getting ISDN installed and operational can take time. The phone company may require two to three weeks just to run a line to your site. When the workers get there, make sure they install the proper jack: at our Berkeley site they installed an RJ-11—a regular telephone jack—instead of the required RJ-45. Once we got that straightened out, we discovered that they'd given us the wrong SPID number—the ISDN equivalent of a phone number—for the San Francisco line, and we lost another day or two waiting to learn the right number. Finally, we were ready to test the VC systems—or so we thought, until we found that none of the VC systems worked over our ISDN line. To avoid wading through normal service procedures, we called a friend at the phone company, who quickly determined that both B channels had been set for data and switched them to one voice line and one data line. Our advice on this: make friends with the engineers at your phone company.

ISDN Catch-22

Even if everything goes smoothly, the phone company will need to know how to configure the ISDN line for your VC system. But before the VC vendor can provide a system, it will need to know how the phone company configures the ISDN line. To circumvent this sand trap, tell both parties that (1) you need one B channel for data and one for voice, (2) the signaling D channel must be set to active, and (3) ringing must be set to on.—**Danny Lee**

Important Factors to Shop For

In picking a DVC system there are many things you should consider. Clearly, poor video is more tolerable than poor audio, up to a point. The microphone quality is important, as is the speaker or headset. If users will be sharing a system, ease of use becomes more important. Consider if you'll need shared applications or just a whiteboard. Will you need to attach an auxiliary video source?

Where you set up your DVC system is also important. If you're not using a headset, you need a quiet location; otherwise, background noise will interfere with your conversation and lower video quality by flooding the transport medium. The lighting at your site is also important for video quality.

Just as with E-mail, there is a definite feel to using DVC that sets it apart from the telephone. The addition of a moving image provides an element of presence, though the small image size and poor image quality tend to mute that feel. The video and audio are often out of sync, and if you focus too much on the video image you get a surreal feeling, as if your conversation were taking place at the end of a long tunnel.

The Last Word

Given the poor quality of the video and audio, you may consider the shared whiteboard and screens of more use than the videoconferencing aspect of these systems. There are several products that provide those features without the talking heads of desktop videoconferencing. Until the image size and quality improve we can't recommend any DVC system for general use, but in some instances they offer greater benefits than remote-control programs like Timbuktu (Farallon, 510/814-5100) or whiteboard programs like Face to Face (Crosswise, 408/459-9060) and Vis-a-Vis (World Linx, 416/350-1000). If you do decide on DVC, determine which product has the best software for your needs, and check out the audio and video quality carefully, under controlled circumstances, before making your decision. Remember that our ratings are based on the audio and video quality, and do not reflect the feature set or ease of use. **m**

MATTHEW LEEDS is the technical services manager for a major software developer. His responsibilities include network management, WAN technology, and digital-video production.

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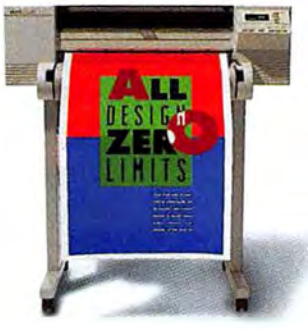

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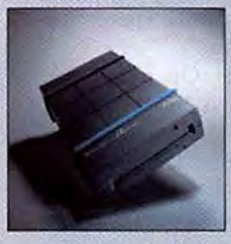

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OpenDoc & OLE 2.0

Two technologies vie

Monolithic programs will soon be a thing of the past; people will instead choose small, manageable tools to work on their documents. People will have a simple way of working with the computer, akin to selecting from screwdrivers and wrenches, not learning to operate a crane.

That's the vision Microsoft offers with its Object Linking and Embedding technology, or OLE. (The ability to call one program from another is called linking, and the ability to put a piece of data—an object—into a foreign program is called embedding, thus the name OLE [pronounced *oh-LAY*].) It's also the vision promised by OpenDoc, under construction by Apple and a consortium of other companies including WordPerfect (recently renamed the Novell Applications Group), IBM, and Lotus Development Corporation.

No longer need you worry about file importing and data exchange. You want a table in your page layout? Just drag a table from your spreadsheet or word processor. Have a picture in your presentation that you want to colorize? Just click on the picture, and the menus and palettes change to those you need for graphics. Even better, this approach has the potential to reduce the seemingly endless amounts of RAM and disk space that today's programs devour.

Two things make OpenDoc and OLE 2.0 possible. One is object technology, which lets a computer manage components (whether tools or data) independently, no matter how they are presented on screen. The other is a *document-centric* approach to objects. In today's application-centric systems, you think of your data in terms of the program that created it; in the document-centric scheme, you think of data in terms of its purpose—a layout, a presentation, a report.

The Object Evolution

The idea of multielement documents is hardly new. Apple introduced publish and subscribe with System 7 in 1991, and Microsoft introduced OLE 1.0 with Windows 3.1 in 1992 (and ported to the Mac shortly thereafter). Even before that, programs such as Aldus PageMaker and QuarkXPress maintained links to component elements: if you edited a graphic used in a layout, the publishing program would update the placed graphic the next time you opened the layout. Integrated software programs—the Works programs from Claris, Microsoft, and others—supported multielement documents, although only using Works-generated components.

And today, with System 7.5's Drag Manager and Clippings extension, you can drag pieces of documents to documents in other programs or even to the Finder—as

by Galen Gruman

long as the originating and receiving programs are compatible with these system extensions and the receiving program supports the type of data being dragged into it, whether it be a TIFF image or a WordPerfect table. (It's just import without using an import dialog box.)

What makes OpenDoc and OLE 2.0 different from these earlier approaches is the fact that almost everything you use would be—or at least could be—a multielement document. The scheme would work the same across all programs and tools—even across Windows and Mac platforms, enabling you to embed a database object from a Windows program in your Mac publishing program, for example. You still won't be able to run that Windows program from your Mac; instead, OLE or OpenDoc will look for a Mac program that can handle the database object. If no such program is present, the data remains intact but cannot be altered (though it can be deleted or moved within the document).

OpenDoc and OLE 2.0 have significant similarities, but don't mistake them for two versions of the same thing. Their differences are at least as significant as their similarities, and whichever technology dominates may well chart the future course of how both programs and the operating system itself work.

OpenDoc Unveiled

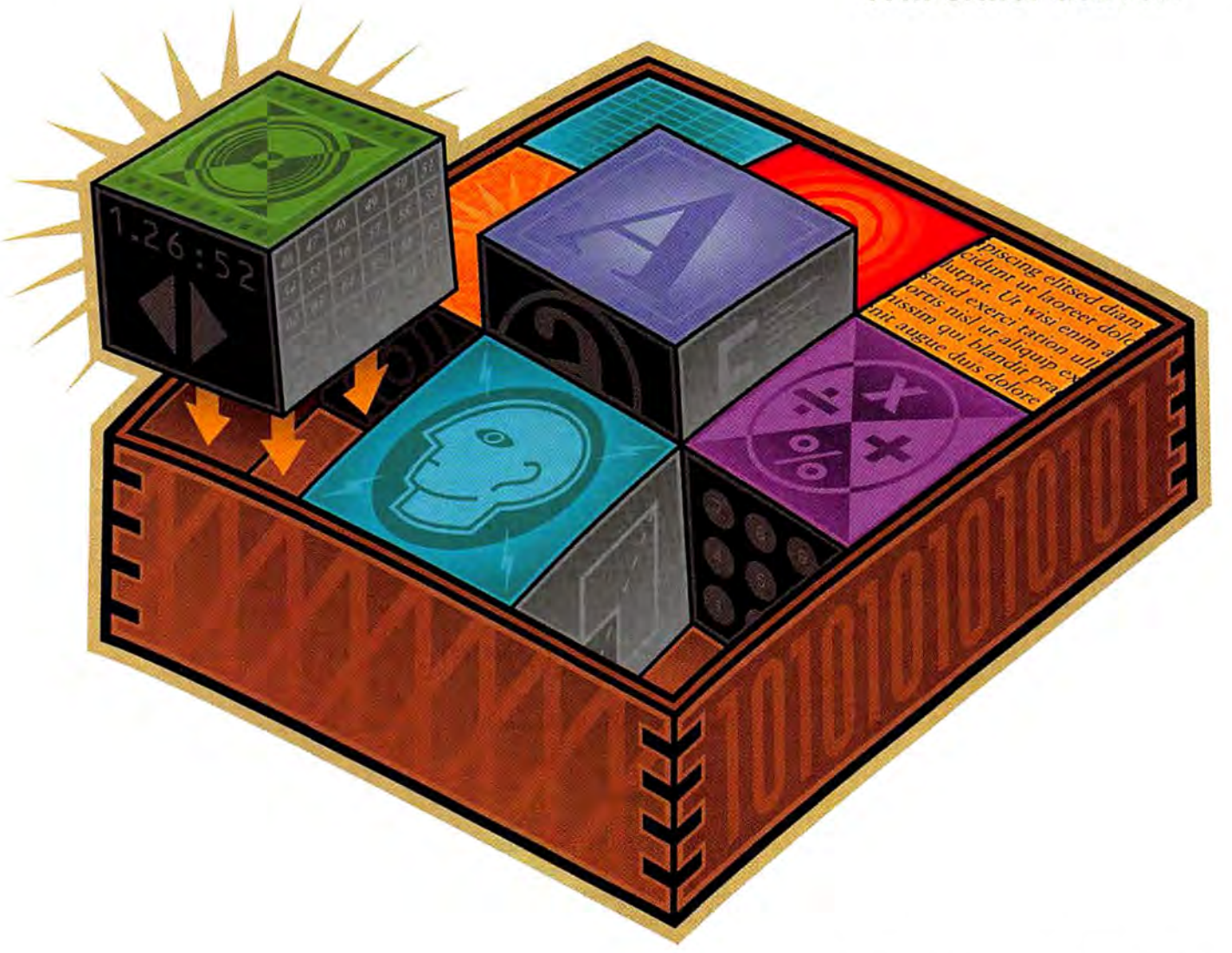
Apple is banking on OpenDoc to be the core interface of the next generation of software. Although the company is keeping mum on its next-generation operating system (code-named Copland and due in late 1995 or early 1996), Apple has made clear that OpenDoc will be part of that future. And in the meantime, Apple plans to release OpenDoc in winter 1995 for use with System 7.5.

How does OpenDoc work? Imagine that after you double-click on a document icon, the document appears along with a basic set of options like Print and Copy. There are no Save or Export or Import menu options—or, for that matter, Font or Style or Image or Record, either. But when you click on a block of text, Style, Format, Font, and Edit menus appear. Select a graphic, and the menus change to Image, Crop, Color, and Background. Select a QuickTime movie, and the options change again, this time to Play, Edit, and Sound. To move elements between documents, you just drag them over.

Life will be simple: you just work with the documents you have and let the system worry about providing the needed

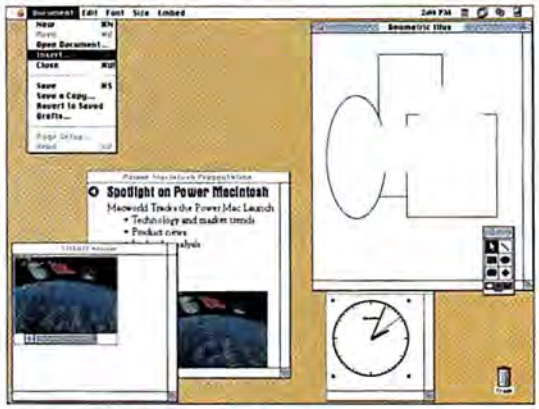
to replace today's bloated software with nimble components.

Will either deliver?



tools for each type of data. This is an ambitious goal. OpenDoc will need to know which tools are appropriate for which kinds of objects, and it will need to know what kind of object is selected (see the screen image "OpenDoc Collection").

If OpenDoc is organized around documents, how do you create a new one? OpenDoc provides two ways. A New command creates a container (an invisible structure that holds all of a document's objects). You then drag objects into the container or use the Embed command to select the tool needed to create the desired object. (The Embed command can also work like today's Import command to bring in data or load a tool that can create the needed type of data.) The other way to begin is to open a stationery document of the type you want (such as a report or presentation) and build on it.



OpenDoc Collection The OpenDoc approach gets rid of the program approach—gone is the File menu—and treats everything as a document containing collections of objects. When you select an object, OpenDoc figures out what tool to load to work with it.

Eventually, OpenDoc should support tool-to-tool communication; this would let, for example, a database tool sort records and pass the results on to a layout tool, which would then run a script to format the information. To do this, however, OpenDoc will need to use IBM's Distributed System Object Model technology, and OpenDoc's developers say it will not be implemented in OpenDoc's first release.

One goal for Apple is to make OpenDoc capable of handling OLE 2.0 objects and links—a tacit acknowledgment of the fact that Microsoft's OLE 2.0 is going to be successful enough to matter. (After all, practically all Mac owners use Word and Excel, whose latest versions support OLE 2.0.) Microsoft has expressed a distinct lack of interest in supporting OpenDoc. OpenDoc development was not far enough along at press time to see whether OpenDoc's promised OLE 2.0 compatibility is a reality.

OLE 2.0 Explained

Microsoft's OLE 2.0 is less ambitious than OpenDoc. Rather than getting rid of application-specific documents, OLE tries to make applications share data more easily. OLE 2.0 lets you embed pieces of data (tables, text, images, movies) created in other programs in the currently open document, no matter what program created that document. When you select an embedded piece, OLE 2.0 launches that piece's creating application and brings up the appropriate menus and tools. (This is called *in-place editing;* you have the context of the host document, even though you have essentially switched to a different program to work with it.)

Thus, if you have an Excel spreadsheet in your Word document, Excel's tools appear whenever you select the spreadsheet, and Word's tools reappear whenever you select the text (see the screen image "Two Programs in One"). But even with embedded objects from other programs, the document remains in essence a Word document, and double-clicking on its icon will launch Word.

Under OLE 2.0, both programs are active in memory. That means you need systems with at least 16MB or so to comfortably handle large programs like Word and Excel simultaneously.

Object Technologies Compared

OLE and OpenDoc have some welcome similarities, but also real differences.

Drag and Drop Both technologies support drag and drop across programs, which makes it easy to exchange data.

In OLE, the dragged data is embedded in the new location unless the new location directly supports the dragged data's format. For example, dragging a chart from Excel into Word embeds a chart object in the Word document, and you edit the chart via an OLE 2.0 link to Excel. But dragging text from Excel into Word just moves the text to Word, since both Excel and Word can directly manipulate text.

OpenDoc treats the dragged data, whether chart or text, simply as another object in the document.

Plug-in Support Both OLE and OpenDoc encourage the plug-in approach to software design, where capabilities can be added to an existing program (or tool collection).

In OLE 2.0, you're made more aware of the fact that you're plugging in a new capability, because you must explicitly link to or load the program that can handle the object or capability.

OpenDoc more transparently links objects to their respective tools, so you quickly forget about separate programs and begin to think of them as different tools within the Mac. It's as if the Mac itself becomes the biggest integrated software program ever invented. OpenDoc will also permit you to add tools that plug into existing tools, similar to the way filters plug into Adobe Photoshop and XTensions work with QuarkXPress.

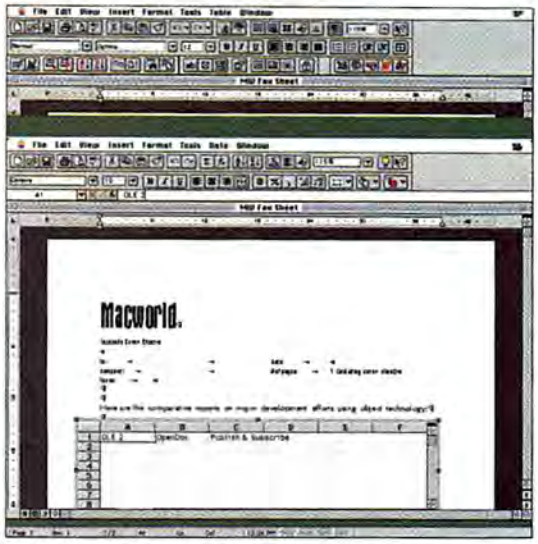
Preferred Tools If you don't own the tool that created an object, or if you simply prefer not to use it, both technologies let you manipulate the object with a different tool. OpenDoc goes a step further by letting you define preferred tools for types of objects, so the system offers you those tools automatically; but this feature was not implemented in the prerelease version I had. OLE 2.0 requires you to explicitly ask for a different tool.

Contextual Feedback In a document-centered environment, feedback about what menus and palettes are available will be highly important.

OpenDoc's pointer changes to the appropriate tool as you pass over an object, giving you instant feedback on the type of object and the type of tool that will manipulate it. This feedback helps you distinguish object types as you work on a series of them, though you don't need that information to edit the object. In fact OpenDoc simply switches to the appropriate tool when you click once on an object. This can lead to more switching than necessary, but fortunately, OpenDoc's fast switching means this is not a burden. Microsoft's OLE 2.0 programs display a message in their status windows when your mouse passes over an OLE object telling you that double-clicking on the object will open a particular program. OLE 2.0 switches tools only when you double-click on an object, so you're less likely to accidentally switch tools. Microsoft says developers can implement single-clicking as a way to select an object, although having two methods could be confusing.

Common Look-and-Feel A collection of tools that look and act differently can confuse users, and developers need to ensure that basic expectations are consistent from tool to tool. To encourage consistency, the OpenDoc consortium has developed a set of interface guidelines.

For OLE 2.0, Microsoft is encouraging consistency by using its Office programs—Word, Excel, and PowerPoint—as a model. These programs look and act very similarly, and by giving developers an Office-compatible rating for OLE 2.0



Two Programs in One The OLE 2.0 approach treats a program as the owner of a document but lets you embed objects created by other programs into the document. When you select an embedded object, OLE 2.0 launches the program that created the embedded object to let you edit it in place.

components, Microsoft hopes to encourage more widespread consistency. However, Microsoft's Office interface is not quite the same as that of either Windows 3.1 or the Mac, so consistency with Office may not mean consistency with, say, other Mac programs or Windows programs from companies other than Microsoft.

Text Wrap OLE 2.0 requires objects to be in rectangular frames, which poses limits on the placement of objects. For example, PageMaker or QuarkXPress would not be able to use OLE 2.0 to replace standard graphics and text import, since that would remove the two publishing programs' ability to do circular or polygonal text wrap or to have overlapping objects. OpenDoc has no such limitation.

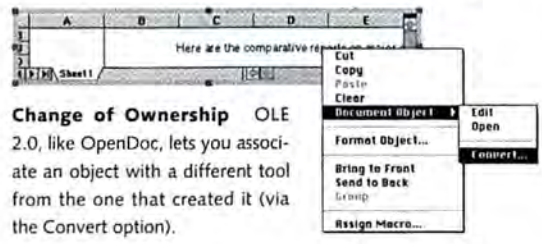
Scripting OLE 2.0 works with Microsoft's cross-platform scripting language, Visual Basic for Applications. VBA lets you tie OLE 2.0–compatible programs together to automate tasks and even develop your own extensions to a program.

OpenDoc relies on the system to do its scripting, so tools will need to support AppleScript on the Mac and VBA on Windows (unless Apple ports AppleScript to Windows, something it has not committed to doing).

Sharing and Multiple Drafts OpenDoc lets users maintain several drafts of a document by storing multiple versions of objects within a document's container or linking those versions to it. That should aid collaborative work such as getting comments on a proposal—even from several users simultaneously. OLE 2.0 has no draft or sharing capability, but it does let you open linked programs over the network. OpenDoc works only on a single machine.

Which Is Better? OpenDoc is a simpler scheme than OLE 2.0. OpenDoc aims to get rid of huge, memory-hungry programs and help users focus on documents. Even better, OpenDoc's trim and efficient scheme is speedy and elegant, capable of maintaining multiple drafts and supporting nonrectangular object boundaries. By contrast, OLE 2.0 requires lots of RAM or lots of patience. To drag and drop data between documents you must have enough RAM to keep several programs open at once; otherwise, you'll be waiting while OLE launches the program you need to do each piece of in-place editing separately.

The reality is that the long-term success of either technology will be based on how well it integrates with the user's operating system. Both Microsoft and Apple are working on future versions of their operating systems that will do just that—Microsoft's Chicago and Cairo, the code names, respectively, for Windows 4.0 and Windows NT 4.0, and Apple's Copland, the code name for System 8. If both companies succeed, OpenDoc will have an advantage on the Mac that Microsoft will be hard-pressed to duplicate by grafting OLE 2.0 onto Copland; but under Chicago and Cairo, OLE 2.0 will have a comparable advantage over OpenDoc. Despite the two companies' best efforts, it's likely that the operating system you choose will ultimately determine the object technology you use, no matter how much better the competitions' capabilities are.



Change of Ownership OLE 2.0, like OpenDoc, lets you associate an object with a different tool from the one that created it (via the Convert option).

Possible Pitfalls

Although object technology has the appeal of simplicity, it's far from clear whether the initial appeal will last.

Are Documents Better Than Programs? Apple claims that people don't think of programs but of documents—you mentally say, "I need to work on the 1995 budget," not "I need to load Excel to work on my 1995 budget." That's true for many people, but many others think, "I need to do some 'what-if' financial scenarios. Let me get the tool to do it." Document-centrism makes sense when you're editing an existing document, but task- or program-centrism make sense when you're creating a document.

That's not to say that OpenDoc's document-centrism will preclude a task emphasis. You'll still be able to open, say, a text document and select a tool to accomplish a graphics task by using the Embed feature. How developers implement OpenDoc will play a large part in determining whether users feel like they're working with a set of tools or with a collection of stray pieces.

And OpenDoc will coexist with today's programs. You can use, for example, a database program for data analysis and a collection of OpenDoc tools to create reports. At worst, to get database information into your report, you'd need a tool that could extract the needed data from your database file.

How Open Is Open? Although the name OpenDoc might imply otherwise, developers could easily write OpenDoc tools that wouldn't work (fully or at all) with other companies' tools. A tool could create objects in a way that would limit access by other tools. Essentially, an object would make public only a limited set of information about itself.

Microsoft says OLE 2.0 does not present a similar possibility, since it is designed so tools can essentially ask an object about itself. Microsoft compares this to two people trying to settle on a common language—"Do you speak English? *Nej. Parlez-vous français? Nej. Sprechen zie Deutsche? Gut!*"—so they can speak with each other. (Apparently, objects can't lie.)

A developer may choose to implement proprietary tools to encourage customers to buy all their tools from one source, or it may limit object support simply because supporting the many types of data and tools will be too hard. For both technologies, being open does not mean being universal.

Object Technology at Work

I don't expect object technology to be the dud that publish and subscribe was. But neither do I see traditional programs going away.

Enhancing Today's Programs In fact, I expect developers to use this technology to enhance traditional programs.

Developers can add capabilities to popular programs, as plug-ins do for Adobe Photoshop and XTensions do for QuarkXPress. OLE 2.0 makes the most

OPENDOC VERSUS OLE 2.0: A FIRST LOOK

Object technology is shaping up to be a battle between competing visions: Apple and friends' OpenDoc and Microsoft's OLE 2.0. While many of the key issues on who will win this battle are political rather than technical (see *State of the Mac*, in this issue), how well the two schemes work is what the ultimate judges—you, the users—will care about. To gauge the strengths of the two technologies, I worked with a very early version of OpenDoc and a final version of OLE 2.0.

OpenDoc Crashes were extremely common, which limited my ability to use OpenDoc for more than a few minutes consecutively. Nevertheless, it's clear, even from the limited number of sample tools provided by Apple, that OpenDoc can work well for compound documents. Switching tools was fast, even at this early stage of development. And I particularly enjoyed the ability to drag objects between documents.

Where I had the most nontechnical difficulty was in document creation. OpenDoc does a good job of making you forget about applications, so starting something new felt unnatural. Sure, I could start with a blank piece of stationery and drag in elements or use the Embed command to load a tool to create them, but that felt like more work than just opening a program dedicated to a particular purpose. I expect, though, that this unease will diminish as I adjust to working in a new way.

OLE 2.0 After using OLE 2.0 with late betas of Microsoft Word 6.0, Excel 5.0, and PowerPoint 4.0, it was clear to me that OLE 2.0 works as a way of creating compound documents. Its embedding works a lot like Word's picture-import feature: serviceable but slow. However, dragging data between OLE 2.0–compatible programs was smooth.

Do expect, however, a noticeable slowdown as you switch between, say, an Excel object and the Word text it is embedded in so you can do in-place editing. With the prerelease versions, the delays were sometimes excruciating. Microsoft expected to remove much of the delay during final fine-tuning, but no amount of fine-tuning can change the fact that you must switch between two big programs in memory. After all, I experienced noticeable delays when working with OLE 2.0 on a 33MHz 80486DX-based PC (which is about as fast as a Quadra 800); and the Windows version of OLE 2.0 has been shipping for half a year, so it's been optimized for best performance. On the Mac, expect the kind of delays you get now when using MultiFinder to switch between Word and Excel.

sense for this, since it extends from programs' existing architectures.

Developers of large, multifunction programs can develop separate components for each set of functions and then update components without revising the entire product. Basically, OpenDoc and OLE 2.0 give developers the chance to make more effective suites, since object technology makes it easier to change components and add plug-ins. Both OLE and OpenDoc make sense for this, although using OpenDoc means writing the programs practically from scratch.

Tentative Steps There are a few early signs that developers are starting to implement the object approach for at least some types of programs.

One example is Visio Express for Microsoft Office, a scaled-down version of the Windows-based Visio flowcharting tools. The Visio Express version is essentially an OLE 2.0 plug-in—similar to the Microsoft Graph, Equation Editor, and Movie, OLE-based plug-in modules that come with Microsoft's Office programs.

Another example is Aldus ChartMaker (available now in a Mac version, with a Windows version promised). It's just a small chart-making program, but Aldus is positioning it as a plug-in to larger programs, even though the only interactions ChartMaker provides are the standard OLE 1.0, publish-and-subscribe, and copy-and-paste interactions. What's different about ChartMaker is that Aldus has adopted the tool concept rather than the full-application concept.

The plug-in approach makes sense for many types of tools. For example, do you really need a separate spelling checker for every program? Using OpenDoc or OLE 2.0, a developer could provide a universal tool. That'll save disk space and make your spelling dictionaries consistent. A module for mailing data directly from your programs is another example. A universal table editor is a third. But for other programs—like databases, which aren't really documents but redefinable views of information—the traditional program-centric approach makes sense.

Drag-and-Drop Future Object technology also has the potential for making drag and drop a more commonplace operation. First, operating systems like the Mac and Windows implemented it for files and programs. Then programs like word processors started supporting drag and drop internally. Now, with either OLE 2.0 or OpenDoc, you'll be able to drag and drop data between programs, whether or not the program can directly manipulate the data. Many Windows developers are already using OLE 2.0 this way to achieve cross-program compatibility, and I suspect Mac developers will follow suit.

When's the Revolution?

If object technology appeals to you (or even if it's something you *don't* want) the question is, Will object technology become part of your reality, and if so, when? Probably not soon.

OLE is real—version 2.0 ships with the latest versions of Microsoft's Office programs, which include Word, Excel, and PowerPoint—but it now works only with these programs and the utilities bundled with them (such as Equation Editor, TextArt, and Microsoft Graph).

OpenDoc is still under development. While Apple and WordPerfect have committed to using it, other developers are waffling. Privately, many say they'll support it only by supporting OLE 2.0, which OpenDoc is being designed to interact with.

Both technologies are new, so don't expect a revolution overnight in how you interact with your Mac. They first must gain acceptance, and that's not a foregone conclusion, since developers remember the pain of developing for System 7's publish and subscribe, only to see almost every user avoid it. Even OLE, which has been around for over two years in the less-capable version 1.0, has been adopted slowly outside of Microsoft.

Object technology will likely play a notable role in future software. If developers do the right thing, OpenDoc will prevail in a way that simplifies programs without sacrificing capability. At worst, we'll have further domination by a few suites that require 64MB of RAM and 2GB hard drives. But all the hype notwithstanding, object technology appears to be an evolution, not a revolution. ■

GALEN GRUMAN is a *Macworld* senior associate features editor who focuses on new system-level hardware and software technology.

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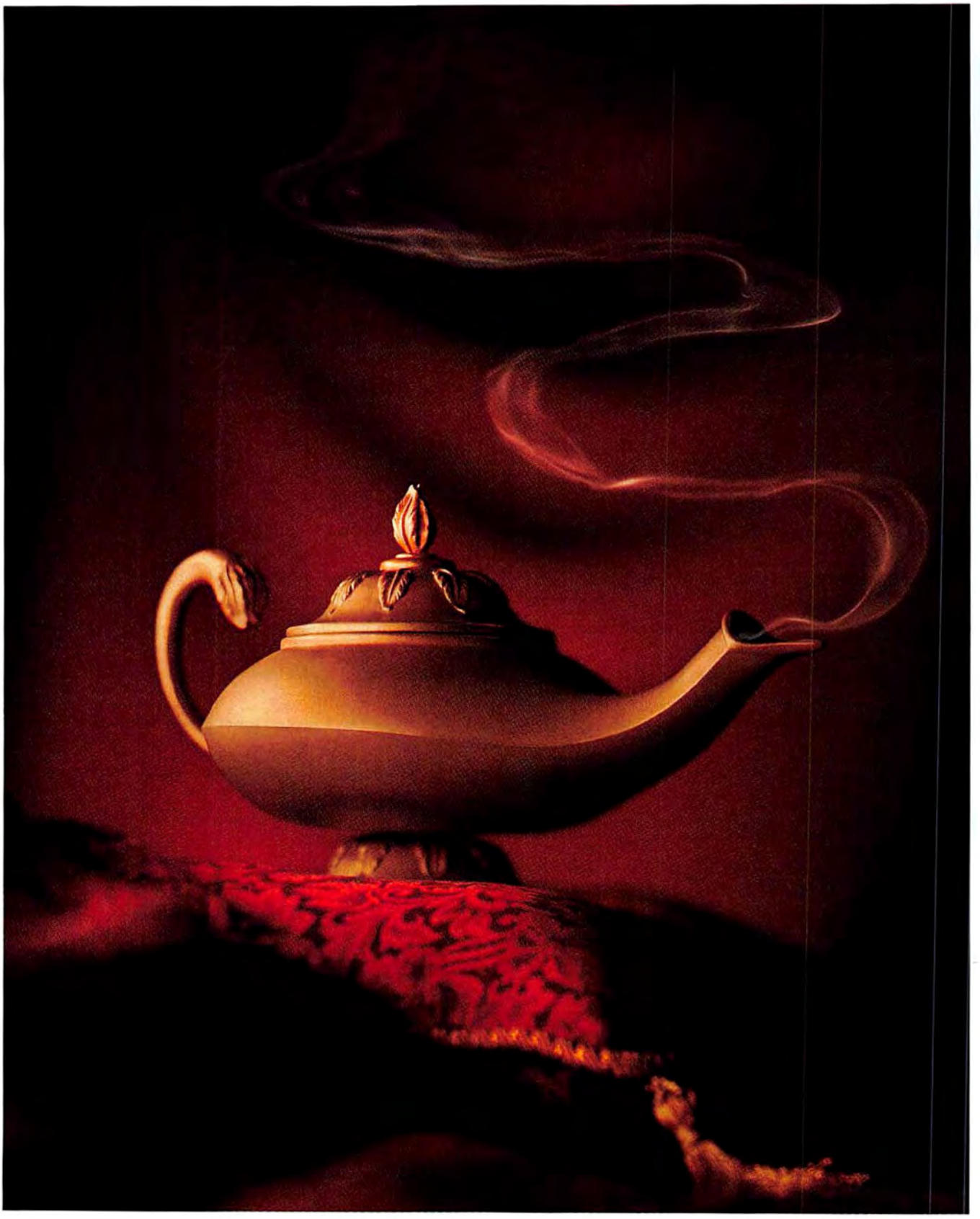

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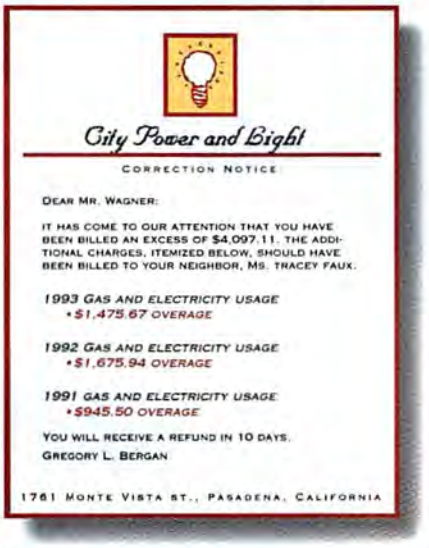

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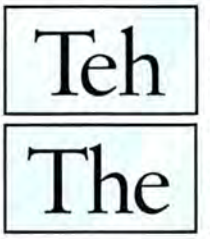

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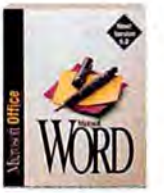

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by Charles Seiter and Tim Warner

MW LAB

Macworld Lab evaluates 22 two-page displays for graphics professionals

BIG SCREEN CLOSE-UP

IF YOU FIND YOURSELF SCROLLING around pages of your work all day—and what designer or artist doesn't?—you'll likely find that buying a bigger monitor is more helpful than buying an accelerated video-display board to speed up the scrolling. After all, you need to scroll less if you have a bigger canvas.

Fortunately, these bigger canvases are getting more affordable—street prices range from $1200 to $3100. Two-page color monitors aren't getting cheaper as fast as Macintoshes are getting cheaper, but prices *are* dropping. For example, Apple Computer's current 20-inch offering costs about $2200—about a third less than its 21-inch product two years ago—and even a bargain-oriented company like MacUSA's Mirror division has dropped the prices for its line by about $500 in that period, a 20 percent drop.

And where there used to be huge price gaps—sometimes a couple thousand dollars—between products, there is now fairly uniform pricing. That's because the state of the art in blowing the giant glass tubes needed for 19- to 21-inch two-page monitors advances rather slowly and has been mastered by only a handful of companies. Many of the monitors we review here, for example, use tubes manufactured by just one company: Hitachi. And most Trinitron-based monitors use tubes made by Sony.

Three kinds of Mac owners will especially benefit from two-page monitors: publishers, graphic artists, and engineers and scientists. Publishers who don't work much in color may prefer a gray-scale monitor instead of color (see the sidebar "Gray Is Cool"), but most artists and designers do work routinely in color, as do many high-end publishers. Engineers and scientists have specialized big-monitor color requirements (see the sidebar "Displays for Rocket Scientists").

Measuring the Rainbow

The big mainstream application for these monitors in the Macintosh world, however, is color graphic design and image manipulation. For these jobs, color quality, uniformity, and color calibration are particularly important.

Macworld Lab put 22 two-page monitors through our standard set of critical tests and also performed perceptual evaluations. Typically, the perceptual evaluations echo the test results—monitors that show a pink or green cast in subjective

≺ Apple's Multiple Scan 20 Display (top) is a great pick for most graphics and publishing professionals. Image editors and others with exacting color-matching needs should buy SuperMac Technology's PressView 21 Display System (bottom).

judgment give off-center white-point measurements in color-space tests—but the perceptual evaluations have the advantage of translating the objective measurements into what counts most for a user: how the monitor actually looks.

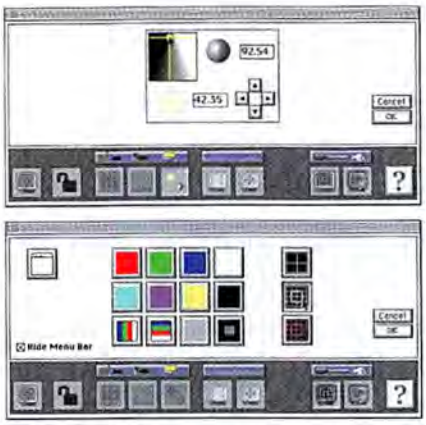
We also talked with graphic artists to learn what they find critical in a monitor for their day-to-day work. This testing and research point to six basic buying-decision issues, ranked here in order of importance.

Size Some of these monitors are listed as 20-inch-diagonal and some as 21-inch. In reality, they all display a 19-inch-diagonal viewing area, plus or minus a small fraction of an inch. Some vendors—Focus Enhancements, for example—offer a nominal 21-inch monitor that shows a smaller viewing area than their own 20-inch units. That's because the vendors are reselling monitors (albeit with slightly different electronic specifications) from different tube manufacturers, who have their own way of labeling the tubes. Pay less attention to the monitor's claimed size than to what you see on the screen.

Quality The range of image quality for these monitors runs from good to great in almost every case. None of the units looks twice as good as another in the set, according to our expert panel. All the manufacturers know the same phosphor tricks and mask technologies; and they use every trick they know for both Trinitron and tridot (also called Invar shadow mask) monitors.

Still, you'll find that different monitors look, well, different. In fact, you will find about as much variation within a set of monitors from the same company as you will within a set of products from several companies. Even if you were to line up ten examples of the BigView Model 21 from XYZ Corporation, they would have different across-screen variations in color purity and different levels of color cast (tint). This is a strong argument for seeing the actual monitor you will buy at a dealer.

Controls The controls on these monitors represent the whole conceivable range of control ergonomics. The Finnish firm Nokia Display Products shows the rest of the world how it should be done. There are two buttons on the front of the Nokia monitor, Select and Adjust. These manage a set of choices that appear on screen for controlling details of picture geometry, focus, and color. Idek Iiyama North America has a more complex but still convenient control system, in which a little drawer full of buttons and indicator symbols pulls out of the bottom of the set. Nanao USA Corporation plans to add on-screen controls in its new FlexScan T2•20 monitor; its FlexScan F series, reviewed here, doesn't include them.



Calibration Controls SuperMac offers sophisticated color-calibration controls for its PressView monitor, which is aimed at photo retouchers. Two options are brightness controls (top) and geometry adjustments (bottom). The controls can be daunting to learn, but their interactivity is excellent.

By contrast, Mitsubishi offers a set of tiny *multifunction* LEDs and buttons in the true spirit of the 137-button handheld VCR control. The controls work, and you can tune up the company's Diamond Pro 21T as long as you have the manual open in your lap to page 16, but if you lose the manual the controls become very difficult to use. Mitsubishi plans to offer software controls this fall.

As with input devices, different people prefer different types of controls. Most people—including the graphic arts professionals we consulted—use monitor controls rarely (typically, just at the initial setup), so you shouldn't give excessive weight to a monitor's controls. All are functional.

Plug and Play The Macintosh market is smaller than the Windows market for most monitor makers, even though Mac owners proportionally use more two-page monitors (thanks to the graphic-arts and publishing community). To sell to the Mac market, the PC-oriented companies include or sell separately an adapter cable that lets the PC-style video connector plug into a Mac. In many cases, Macworld Lab—which tests about 100 monitors a year—had difficulty figuring out the proper adapter settings. What should have been a 30-second operation sometimes took 10 minutes. You may safely assume that if a vendor is willing to send a monitor for review to *Macworld* with the wrong settings, it won't hesitate to do the same to you.

You'll see PC bias in software as well. For example, NEC Technologies sent us color-adjustment software that runs only on a Windows PC, although Mac software is promised for late 1994. Other vendors sent us documentation that chirped on merrily about SVGA and other PC matters, with nary a mention of the Macintosh. The traditional Mac vendors (Apple, Radius, RasterOps Corporation, and SuperMac Technology) of course do a better job with cabling, setup, and software than vendors for whom the Mac is an incidental business and something of a nuisance.

Resolution switching Now that Macintoshes support multiple resolutions, you can increase your working area (although at the price of smaller images) or zoom in on it (at the price of a smaller window on your desktop). We did our testing at 1152-by-870-pixel resolution, the setting that lets you display two 8½-by-11-inch pages side by side at near-actual size. However, there are situations (conference-room display, for example) where you would want a two-page monitor to be simply a very big one-page monitor at 640-by-480-pixel resolution.

Price A monitor needs to offer a good value. For layout and graphics-placement use, expect to spend about $2000. If you do demanding color work

Two-Page Monitors Compared

Company	Phone
Apple Computer	408/996-1010, 800/775-2775
Focus Enhancements	617/938-8088, 800/538-6000
Idek Iiyama North America	215/957-6543, 800/394-4335
Ikegami Electronics USA	201/368-9171
MacUSA Mirror division	612/832-5622, 800/654-5294
Mitsubishi Electronics America	714/236-6352, 800/843-2515
Nanao USA Corporation	310/325-5202, 800/800-5202
NEC Technologies	708/860-9500, 800/632-4636
Nokia Display Products	415/331-0322, 800/296-6542
Radius	408/434-1010, 800/227-2795
RasterOps Corporation	408/562-4200, 800/729-2656
SuperMac Technology	408/541-6100, 800/334-3005
ViewSonic	909/869-7976, 800/888-8583

* *CEP = company's estimated price; DP = direct price; LP = list price*

GRAY IS COOL

If you're using a Mac professionally and your output won't be printed in color, you are likely to find a two-page gray-scale monitor to be less expensive and more suitable for your applications. For monochrome or two-color publishing of books, magazines, or newsletters, a gray-scale monitor is ideal.

Text on all gray-scale monitors looks great. There are none of the color-fringing problems on text from misconvergence that occur with color monitors, since there's only one electron-beam gun lighting up the phosphors. Many graphics professionals claim that a gray-scale monitor is easier on their eyes in prolonged use than are the best color monitors.

Gray-scale monitors are a relatively specialized item compared with color monitors—the choices here represent the small range available in late summer 1994. Expect that range to get smaller, since diminished sales have prompted many companies to drop their monochrome lines. For example, Mobius Technologies has only a few hundred left and has no plans to make more.

• Focus Enhancements (617/938-8088, 800/538-8865) acquired Lapis Technology last year and dropped the price of the 19-inch Lapis Two Page Display to $599.99. But it's not clear how long these monitors will be available at such a low price. (It looks to be an inventory close-out.)

• MacUSA's Mirror division (612/832-5622, 800/654-5294) has a two-page (19-inch) gray-scale monitor for $699. If you're setting up a publishing operation on a limited budget, this model combined with a low-end Centris would be quite effective.

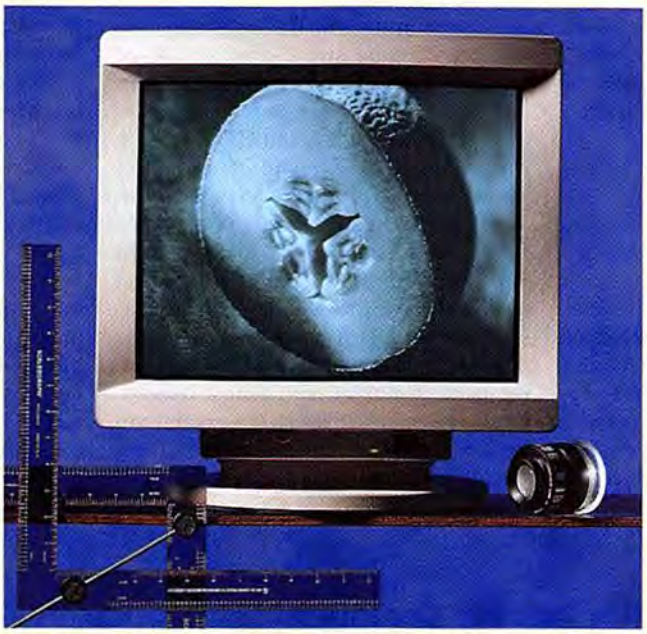
• Mobius Technologies (510/654-0556, 800/523-7933) also offers a $699 19-inch monitor, the Two-Page Display GS. It features a low-curvature, low-glare screen.

• Nanao USA's 21-inch FlexScan 6500 (310/325-5202, 800/800-5202) supports resolutions up to 1664 by 1200 pixels. At Nanao's suggested price of $1119, it's essentially the gray-scale version of the color FlexScan F760i•W reviewed here.

• Radius (408/434-1010, 800/227-2795) produces both 20- and 21-inch gray-scale monitors, the $999 Two-Page Display/20gs and the $1199 Two-Page Display/21gs. Both use the built-in video on Quadra and Centris Macs to display 256 gray levels at 1152-by-870-pixel resolution.

• Sigma Designs (510/770-0100, 800/845-8086) offers the MultiMode 150 for high-end publishing users. At $1349, the 150 offers resolutions as high as 2048 by 1536 pixels (150 dpi) and can switch to black-and-white display.

—Charles Seiter



Gray-scale monitors, such as this Mirror 19-inch, are ideal for some publishers.

Product	Price *	Mac Adapter	Tube Type	Perceptual and Operational Comments	Technical Support
Multiple Scan 20 Display	$2149 CEP	not needed	Trinitron	Bright; sharp text; Multiscan software worked fine.	unacceptable
LapisDisplay 20i	$1899 CEP	included	tridot	Lacks sharpness and purity.	acceptable
LapisDisplay 20t	$2099 CEP	included	tridot	Sharp text, but had geometry problems; adapter incorrectly set.	
LapisDisplay 21i	$2100 CEP	included	Trinitron	Clear, sharp display.	
Vision Master MF 8621	$2495 LP	$35 option	tridot	Color purity off, but text is crisp; adapter incorrectly set.	poor
C/N 20A	$1999 LP	$19.95 option	tridot	Good contrast; sharp text.	very good
C/T 20A	$2495 LP	$19.95 option	Trinitron	Sharp, bright display.	
ProView 20T	$1999 DP	included	Trinitron	Odd tinting; adapter not preconfigured.	poor
ProView 20V	$1399 DP	included	tridot	Geometry problems (keystoning, wavy sides); adapter incorrectly set.	
ProView 21	$1999 DP	included	tridot	Good picture.	
Diamond Pro 21T	$2399 LP	free option	Trinitron	Confusing controls, but good picture once adjusted; separate cables for each resolution.	acceptable
FlexScan F760i•W	$2069 CEP	$15 option	tridot	A favorite: sharp text; fairly bright appearance; adapter not preconfigured.	acceptable
FlexScan F780i•W	$3259 CEP	$15 option	tridot	Sharp text but screen appears dim; adapter incorrectly set.	
MultiSync 6FGp	$2125 CEP	free option	tridot	Slightly green cast; squashed menu bar.	excellent
Multigraph 445M	$2475 LP	included	tridot	Slight purity problems in corners; uses on-screen menus for adjustments.	excellent
Multigraph 445X	$3225 LP	included	tridot	Same as 445M, except for slight focus problem.	
PrecisionColor Display/21	$2499 LP	included	tridot	Appears dim; nonuniform brightness; easy setup.	very good
20/20 Multimode Color Display	$1869 LP	included	tridot	Good color purity, brightness, and text; tube shape is bulbous.	acceptable
SuperMatch 21TXL	$2599 LP	not needed	Trinitron	Bright; sharp despite some distortion at side.	acceptable
PressView 21 Display System	$3999 LP	not needed	tridot	Excellent display after complete calibration; best color-control software; very flat tube.	
ViewSonic 20	$1795 LP	free option	tridot	Blue cast and low contrast, which reduce perceived brightness.	very good
ViewSonic 21	$1995 LP	free option	tridot	Image bowing; greenish cast; adapter not correctly set.	

that requires color matching and calibration, expect to spend about $2800. When looking at the prices in the table, "Two-Page Monitors Compared," keep in mind that the price differences there are exaggerated—the $2600 difference between the cheapest and the costliest is more like $1900 if you compare street prices. For monitors with good quality, the price spread is about $1000.

For example, Focus Enhancements' LapisDisplay 21i lists for a relatively modest $2100 and is sometimes sold as low as $1999, while SuperMac's PressView 21 Display System has the grand list price of $3999 but sells for $2400 or so from a dozen sources.

Judging Image Quality

The overall image-quality range in these monitors is fairly small because they are produced by a handful of manufacturers in ferocious competition with each other. Because the vendors mix and match their own electronics with tubes and assemblies from different vendors, you can't say, unfortunately, that "*X* is a good brand." For example, the $1999 Mirror ProView 21 did well in perceptual and objective ratings, but the $1999 Mirror ProView 20T got little respect. Nanao's lower-cost FlexScan F760i•W was more highly regarded than the costlier F780i•W.

One consistent brand-quality pattern, however, shows up in picture-tube sources. The high-ranking Ikegami Electronics USA monitor uses Trinitron tubes manufactured by Ikegami under Sony license, while the consistently lower-ranking ViewSonic units are both based on Matsushita tubes.

In the middle of the pack are nine monitors in the street-price range of $1850 to $2450: the Apple Multiple Scan 20 Display, the three Focus LapisDisplays (20i, 20t, 21i), the Ikegami C/N 20A, the Mirror ProView 20T and 21, the NEC MultiSync 6FGp, and the ViewSonic 20.

In our technical-support evaluations, Apple didn't return most calls, a pattern that *Macworld* has seen now for several months across product categories. Despite its habitual flaws in after-sale support, Apple has the monitor of choice in the pack of nine for two simple reasons. First, the picture quality is near the top for this pack, and second, there isn't any kludging around with adapters and DIP switches and non-Mac software. And while the price is not bargain-basement, it is reasonable.

Getting the Color Right

Good color is important to graphic artists: they depend on high color fidelity when doing their work. The fundamental problems with choosing a color display may be described as the Circuit City syndrome. If you go into a store with a wall of color TVs, you can step back and see that many of them are out of calibration, featuring the same newscaster with a relatively green face in some cases and a bright orange face in others. But if you look at just one individual TV for a while, the perverse miracle of color-vision compensation takes over, and your brain makes the face look relatively normal.

As your monitor gets out of calibration (or if it never was calibrated), the same phenomenon occurs. That's no problem if the only colors you use are those on your desktop pattern and icons, but if you are working with color on screen for printing later, that mismatch can hurt the output quality. Thus, to get professional results throughout the

MW LAB Two-Page Monitor Quality Compared

Brightness

Most people prefer a brighter monitor. We turned up the screen's brightness as high as it could go without showing scan lines. A monitor that puts out less than 20 footlamberts is considered dim.

Contrast

The greater the contrast ratio, the more details show up in both light and dark areas of an image. We calculated the ratio between the luminance of white and solid color squares throughout the screen. A ratio of 6.0 or more to 1 is good.

Convergence

Convergence denotes how closely a monitor's red, green, and blue electron beams hit the same pixel on screen. The better the convergence, the sharper the image and the truer the colors. A measurement of 0.45 or less is good.

Gray Linearity

Gray linearity shows how accurately a monitor displays shades of hues across the spectrum from 100 percent to 0 percent. A perfect linearity measurement is 0. The worst possible linearity is 2700.

Best result for each test.

Products are listed in alphabetical order.

	Brightness	Contrast	Convergence	Gray Linearity
	Longer bars are better.	Longer bars are better.	Shorter bars are better.	Shorter bars are better.
	20	6.0	0.45	
Apple Multiple Scan 20 Display	26.2	15.2	0.58	337
Focus Enhancements LapisDisplay 20i	30.0	8.8	0.39	289
Focus Enhancements LapisDisplay 20t	30.8	14.1	0.60	290
Focus Enhancements LapisDisplay 21i	32.0	12.2	0.28	336
Idek Iiyama Vision Master MF 8621	23.9	11.8	0.56	475
Ikegami C/N 20A	34.4	12.9	0.33	294
Ikegami C/T 20A	28.0	12.2	0.60	282
MacUSA Mirror ProView 20T	33.7	9.4	0.50	280
MacUSA Mirror ProView 20V	25.9	14.2	0.44	391
MacUSA Mirror ProView 21	28.1	13.7	0.50	417
Mitsubishi Diamond Pro 21T	36.7	19.4	0.50	364
Nanao USA FlexScan F760i•W	23.5	10.2	0.41	431
Nanao USA FlexScan F780i•W	32.8	11.1	0.33	397
NEC MultiSync 6FGp	36.9	13.8	0.49	384
Nokia Multigraph 445M	32.3	10.2	0.62	294
Nokia Multigraph 445X	38.7	14.6	0.77	197
Radius PrecisionColor Display/21	24.0	11.3	0.31	456
RasterOps 20/20 Multimode Color Display	38.7	12.7	0.27	285
SuperMac SuperMatch 21TXL	28.4	12.4	0.27	388
SuperMac PressView 21 Display System	32.5	15.0	0.38	471
ViewSonic 20	31.7	8.1	0.57	223
ViewSonic 21	36.4	12.6	0.63	257
	Footlamberts	Ratio of white luminance (1.0) to solid black (number above)	Millimeters	Total of variances from ideal values in 12 tests

design/print cycle, color monitors must be calibrated by something other than an individual user's judgment.

The simplest scheme, used by Nanao, is a program called Colorific, developed by Sonnetech. With Colorific software, you set a gray-scale midpoint by matching a zone of gray to a zone of 50 percent black-and-white tiny checks; you set the white point using a calibration card specially developed for white-matching under standard office fluorescent lights. At press time, the Colorific software was still in development, but Nanao expected to have it bundled with its two-page monitors shipping in mid-September. Sonnetech plans to license Colorific to other monitor makers as well.

Colorific's simple scheme gives a calibration accurate to one part in several thousand, nearly the range of Pantone printed-color possibilities.

Two other companies offer calibration through hardware-software combinations. Radius's $599 PrecisionColor Calibrator and SuperMac's $399 SuperMatch Display Calibrator both use an optical sensor to provide feedback to calibration software. This method lets the software correct the display through all the points of the gamma curves for the individual colors, and establish color-temperature settings. SuperMac also offers a $799 Pro version of its calibrator that uses an even more exacting calibration method and supports several color-matching systems, including Kodak and EfiColor. (The standard calibrator supports just the EfiColor matching system.)

The PressView's bundled color-matching software, for example, runs through the calibration procedure mostly unattended. This procedure doesn't necessarily guarantee that your color proofs from the printer will be perfect the first time out, but it does guarantee consistency.

SuperMac's PressView monitor comes with the SuperMatch Display Calibrator Pro hardware and customized color-control software (see the screen image "Calibration Controls"). That software offers a high degree of control over everything from color temperature to electron-beam adjustments, but its interface is not particularly intuitive, due primarily to the poor design of its icons. However, the controls themselves are very interactive and offer strong feedback. In some cases, such as pincushion correction and picture size, it's easier to use the hardware controls. But when the PressView software is active, the hardware controls are disabled.

Advanced Degree Required These two cable adapters (Enhance Cable Technology's Liberty Cable Adapter, right, and Total Technologies' Unimac), one of which is bundled with many monitors, can be set to support almost any monitor and video resolution. But the setup process is anything but simple, Mac-style plug and play.

Plug and Pray

Because most monitors are designed with the PC user in mind, they don't work as expected on a Mac. That's partly because working with Macintosh internal video requires a cable or adapter that uses a wiring pattern called a *sense key*. Without this key, the Mac assumes no monitor is present and doesn't generate a video signal.

This comes as a surprise to PC-oriented monitor makers, who expect a video card to generate a video signal whether or not a monitor is attached.

The adapters that PC-oriented vendors include with their monitors primarily tell the Mac that a monitor is present, and they tell the Mac what pixel resolution to display. However, to achieve this compatibility—and at the same time work with all computers and displays—several adapters we received are covered with many confusing dials and switches. Worse yet, most adapters came configured incorrectly.

For example, two cable adapters bundled with several monitors can be easily configured to display an 1152-by-870-pixel resolution—once you know how (see the photo "Advanced Degree Required"). To use the Liberty Cable Adapter from Enhance Cable Technology ($39.95, 408/293-2425), set the dial to P. To use the Unimac adapter from Total Technologies (about $15 from several distributors), set DIP switches 5, 6, and 7 to the on position (the switches are under a metal covering).

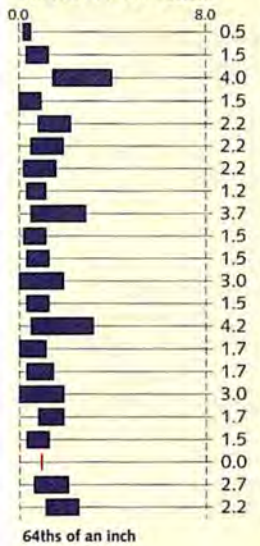
But getting the right resolution is only half the work. The switches also control the synchronization signals that the monitor needs to line up the pixels in their proper places on the screen. Incorrect sync leads to two common setup problems: sync doubling, where the entire screen appears to be covered with a light green ghost, and lack of sync, where the screen appears black.

Fixing a sync problem is usually simple—but, again, only if you know how. With the Liberty adapter, just change DIP switches 7, 8, and 9 from on to off,

Distortion

Bars show the difference between a screen's minimum (left side) and maximum (right side) distortion. A maximum distortion of less than 8.0 is good. The longer the bar, and the farther it is from 0.0, the more noticeable distortion is.

Shorter bars are better.



BEHIND OUR TESTS

Macworld Lab tested two-page monitors by measuring several aspects of visual quality. We measured brightness and contrast—which are key determinants of overall subjective quality (whether a monitor looks good)—with a Minolta luminance meter on a standard black-and-white target screen. We determined linearity—which determines the subjective color range and fidelity—by measuring the contributions of the red, green, and blue electron guns as we decreased the brightness of an all-white desktop in 10-percent increments. We measured distortion—which determines how accurately shapes are displayed—by displaying a black-and-white target that put 1-inch squares in the corners, along the edges of the display, and in the center and then using an antiparallax ruler to compare the size of the outer squares to the size of the center square. Finally, we measured convergence—another key determinant of accurate shape display—by using a Klein convergence meter, again at the center and in each corner.—**Macworld Lab testing supervised by Tim Warner**

DISPLAYS FOR ROCKET SCIENTISTS

Engineers and scientists need to look at large CAD drawings, circuit layouts, and DNA restriction maps—all applications where color is used to code information. That means that most applications use a limited palette, and a diagram is much more likely to have 16 colors than 16.7 million. Only a few scientific applications—in medical and bioanalytical imaging—involve display of color or gray-scale subtleties. Color accuracy, for example, isn't critical if your output device is an eight-pen color plotter.

Text sharpness, however, is very important in big diagrams full of fussy little 6-point tables and labels. If you're buying a monitor for technical applications, there are two columns in the table, "Two-Page Monitors Compared," to pay more attention to: tube types and comments.

As a broad generalization, Trinitron monitors look good when displaying diagrams because the Trinitron mask gives you very sharp vertical lines. Because sharp vertical lines contribute to text clarity, these monitors are also good at the fussy little labels. My first choice for technical use is Apple's own Multiple Scan 20, with the Ikegami C/T 20A a close (but more expensive) second.—**Charles Seiter**

or vice versa. With the Unimac adapter, toggle switches 2 and 3. Occasionally, you must toggle a switch on the monitor, or attach or remove a sync cable (this is generally just for BNC connectors, which are the ones with three separate connectors into the monitor).

To eliminate the confusion of setting an adapter, several vendors—Radius, SuperMac, Ikegami, Mitsubishi, and Mirror—ship either Mac-specific cables or Mac-specific adapters fixed to a particular resolution and sync. RasterOps, however, does not provide such a simple solution. But it is making up for the oversight by developing a special cable it plans to include with future monitors.

The new RasterOps cable has a sense key that tells the Mac that a multisyncing monitor—one capable of displaying many different resolutions, which most of these monitors do—is present, taking advantage of new software from Apple that allows resolution switching on the fly. A new version of the Monitors control panel works with another extension called Display Enabler to let you change resolutions without restarting. These ship with System 7.5 and require built-in video. (The Power Macs and Power Mac upgrade cards, which use System 7.1.2, also include the software.)

But you don't need the RasterOps cable to take advantage of this new capability. For example, you can use the Liberty adapter with Apple's software, too. Set the dial to J; set pins 7, 8, and 9 to the appropriate position for your monitor's sync; set pin 3 to on; and you're on your way.

Of course a couple of similar solutions have been around awhile. With NEC monitors, you can use the bundled DPI-On-The-Fly software (it works with the Quadra 700 and 900 and the Centris and Quadra 610 and 650 models). Also, a shareware program called Monitor Switch performs resolution switching in Centrises (with more than 1MB of VRAM) and Quadras (with more than 2MB of VRAM).

If this effort doesn't appeal to you, look to a traditional Mac monitor maker instead of the PC-oriented ones. But keep in mind that a traditional Mac vendor may also offer monitors that succumb to configuration mania, since Radius, SuperMac, RasterOps, and even Apple are now trying to sell to PC users, too.

The Last Word

The 22 two-page monitors Macworld Lab examined may be similar, but they're not identical. Besides the obvious modest differences in price, there are big differences in Mac-friendliness and color-adjustment capabilities.

If your career depends on good color work, you should get a SuperMac PressView 21 with SuperMac's calibration system. Don't let the high list price scare you—the street price is only a few hundred more than its closest rivals'. With a bit of patience, the PressView can be coaxed into the best results you can buy. (SuperMac recently started shipping the PressView 21•T, which uses a Trinitron tube and supports 1600-by-1200-pixel resolution but is otherwise the same as the regular PressView 21. The 21•T costs the same as the regular model.)

Otherwise, there's a whole slew of perfectly good monitors to choose from. We'd start with the Apple Multiple Scan 20, Ikegami C/N 20A, Nanao FlexScan F760i•W, and RasterOps 20/20. Of these, the best bet is the Apple Multiple Scan 20 Display, since it comes at a fair price, has excellent image quality, and doesn't put you through any of the connection and setup rigmarole that the PC-oriented monitors do. But we can't award it an Editors' Choice because of Apple's dismal technical support.

Several other companies sell two-page monitors worth looking at, but they were changing their product lineups during our testing, so we could not evaluate them. These include Sony Computer Peripheral Products (408/432-1600), whose monitors have rated well in past evaluations; Sigma Designs (510/770-0100); Philips Consumer Electronics (615/475-0317); MAG InnoVision (714/751-2008); Tatung Company of America (310/637-2105); and CTX International (909/595-6146), a newcomer to the Mac market.

If you're ready to buy a two-page monitor now, you can do so without fear that the price will drop by half or that 21-inch LCD panels will soon make your purchase obsolete—radical change is not imminent. Sure, a few sellers will have dropped out of the chase, a few will enter the fray, and prices will gently decline a bit. There are a few price/performance standouts, there are no outright horrors, and the field is ready for some aggressive comparison shopping at your local Mac dealer. **m**

CHARLES SEITER, a *Macworld* contributing editor, has designed colorimeters, densitometers, calibrators, and other color-process equipment. TIM WARNER is an associate lab editor at *Macworld* who specializes in display technology.

TWO-PAGE COLOR MONITORS

MW EDITORS' CHOICE

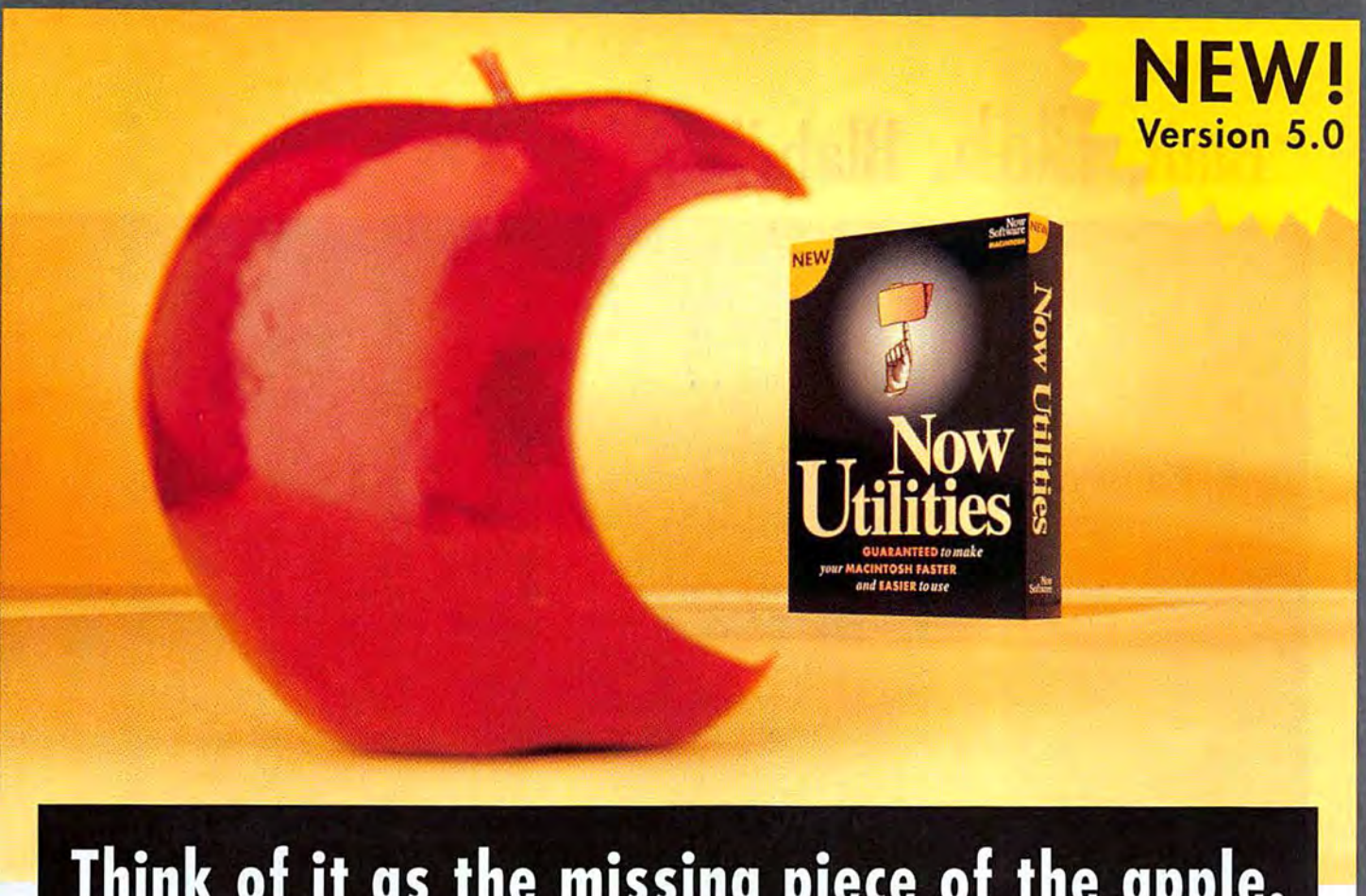
To pick the best two-page color monitor, we looked at display quality, ease of setup, price, and technical support. Because graphics professionals are the major users of such monitors, we gave the most attention to quality and setup issues.

For Color Professionals

PressView 21 Display System Best image quality, most exacting color-calibration, and a decent street price (about $2400) make this the top pick for retouching and other color-critical work. **Company:** SuperMac Technology. **List price:** $3999.

For All-Around Graphics

No choice There are many good monitors available, and it is impossible to single out any above the rest.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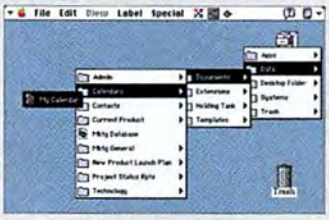

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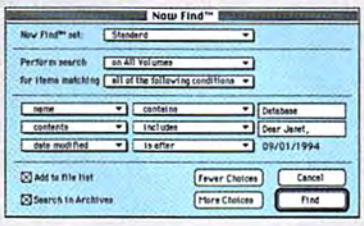

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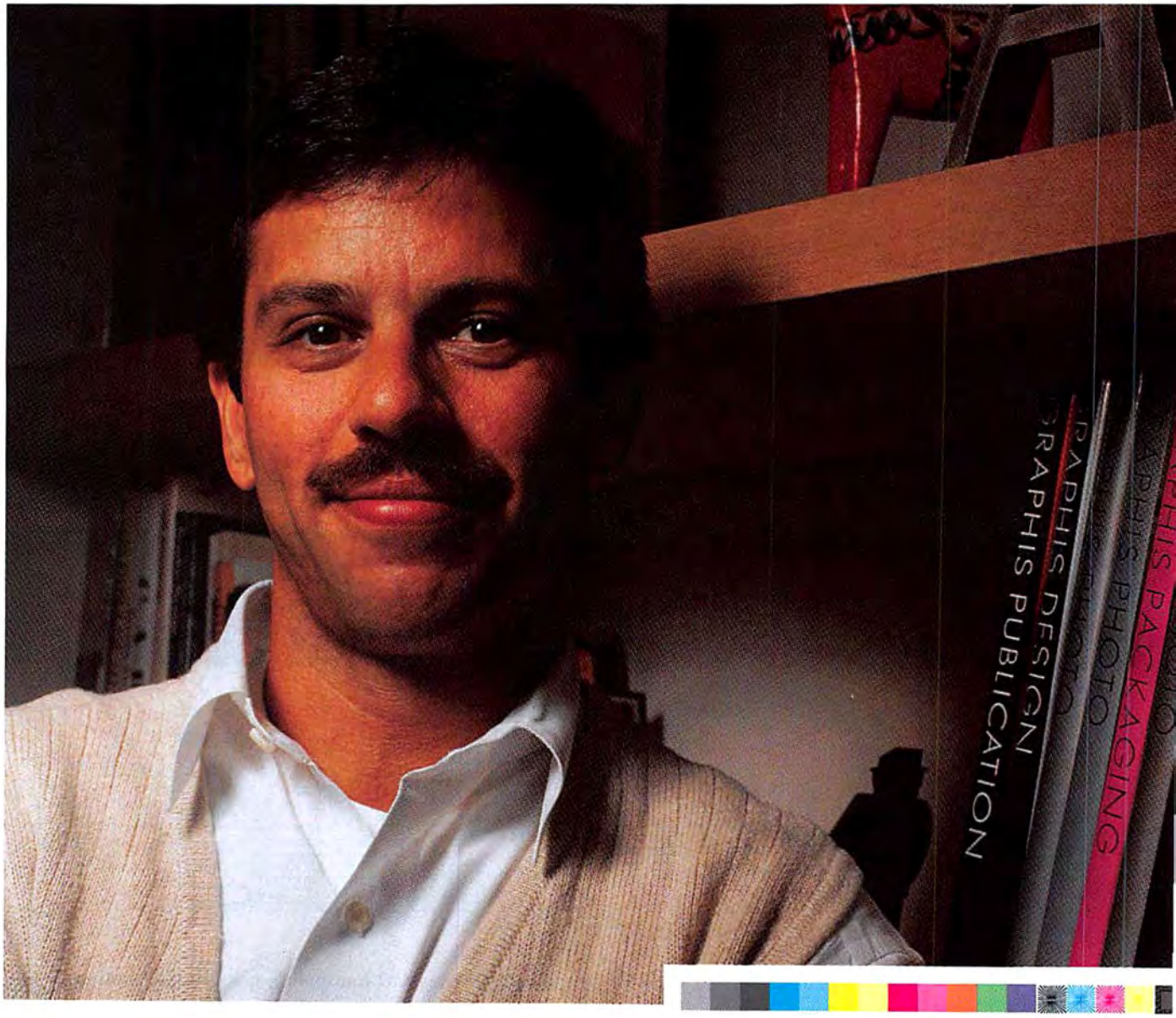

Steve Tolleson, Owner, Tolleson Design.
San Francisco, California.

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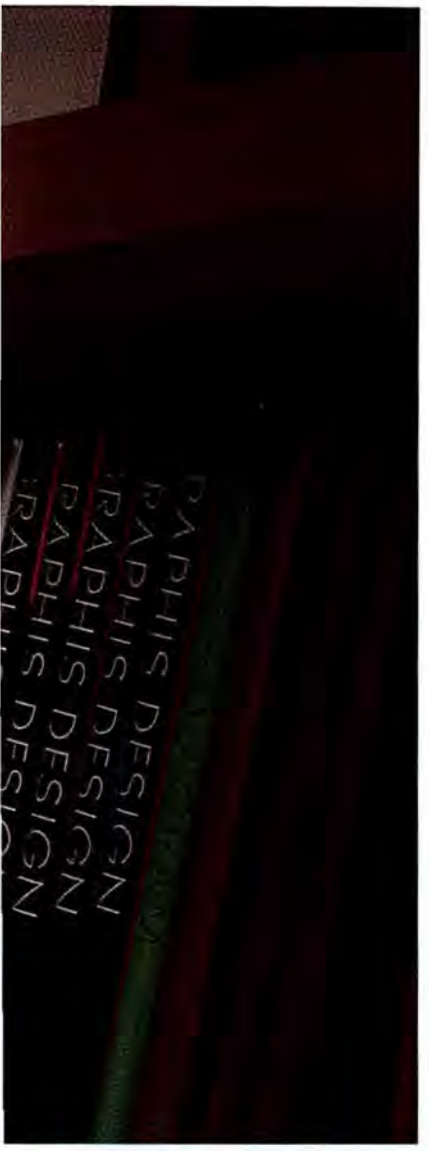

We've all heard it a thousand times before. The "commitment to quality" mantra. But all clichés aside, to be the best there's only one way to do things – and that's the right way. How do I maintain excellence and still balance the bottom line? I skip the hype. I stick with Scitex.

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Circle 233 on reader service card

EDITED BY JAMES A. MARTIN

Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

Scanners Break the 24-Bit Barrier

AGFA AND EPSON AMERICA HAVE both announced desktop color flatbed scanners that capture images at 30 or 36 bits but cost about the same as some 24-bit models.

Unlike 24-bit scanners, which record 8 bits of color information per red, green, and blue channel, the new high-bit scanners from Agfa and Epson record 10 or 12 bits of color information per RGB channel (depending on the scanner) for a total of 30 or 36 bits.

The scanners automatically *downsample* the images, a process that results in 24-bit files with less noise and better gradations and contrast than images captured on 24-bit devices, the vendors say.

In recent months, other scanner manufacturers such as Microtek and Umax Technologies have announced competitively priced flatbed models that capture images above 24-bits. For more information, see *Graphics* news, June 1994. The Agfa Arcus II (suggested retail price $3500), which replaces the 30-bit Arcus Plus model, is a one-pass, 36-bit scanner with an optical resolution of 600 dpi; maximum interpolated resolution is 2400 dpi for color, 3600 dpi for line art. The scanning area is 8.3 inches by 14 inches for reflective originals and 8 inches by 10 inches for transparencies (via an integrated transparency module). Bundled software includes Adobe Photoshop 2.5.1 (3.0 will be bundled when available) and Agfa's FotoTune Light for color management.

Agfa's new StudioScan II (estimated street price $995) is a one-pass, 30-bit flatbed scanner with an optical resolution of 400 dpi, interpolated up to 2400 dpi for color and line art. The scanning area is 8.5 inches by 14 inches for reflective artwork; there's an optional transparency module for slides (street price $400). Bundled software includes Adobe Photoshop LE, FotoTune Light, and Caere OmniPage Direct for OCR. Both Agfa scanners should ship in August.

SEAN SULLIVAN

The 30-bit ES-1200C-Pro Mac scanner from Epson has an optical resolution of 600 dpi, which can be interpolated up to 4800 dpi (for color and line art). This scanner, unlike most, lets you switch between one- and three-pass scanning, so you can choose the best method for a particular image. The scanning area is 8.5 inches by 11.7 inches. The scanner comes with Photoshop 2.5 (3.0 when available), Kai's Power Tools 2.0, and other software. Due to ship in August, the ES-1200C-Pro Mac lists for $1499; the ES-1200C (the same scanner but without Photoshop and Kai's Power Tools) sells for $1049. Agfa, 508/658-5600; Epson America, 310/782-0770.—J.A.M.

A Service Bureau on Your Desktop

LASERMASTER IS PUSHING THE CONcept of desktop prepress a step further with the introduction of the PressMate, a chemical-free film printer that, when combined with LaserMaster's Unity 1800PM-R high-resolution printer, creates what the company says will be an industry first: a "desktop service bureau."

The PressMate ($19,995) uses a proprietary heating method to produce camera-ready color film negatives, positives, and proofs (maximum size: 12 inches by 24 inches) in a desktop device. Although

the PressMate is based on a 600-dpi print engine, LaserMaster's ThermalRes technology boosts the PressMate's resolution up to 2400 dpi for text and line art and is capable of producing screen tints up to 133 lines per inch, according to the company. The PressMate uses LaserMaster's ColorMark color-management system, which supports the Trumatch swatching system and Specifications for Web Offset Publications color standards.

The PressMate has no PostScript interpreter of its own; instead, it must be linked to LaserMaster's Unity 1800PM-R plain-paper typesetter ($9995), which features an enhanced PostScript Level 2 interpreter from Pipeline Associates. The Unity is based on a Toshiba 600-dpi print engine, which LaserMaster's TurboRes technology bumps up to look like 1800 dpi. The two devices are connected via LaserMaster's VideoNet port, a video-signal technology that the company says offers real-time file-transfer speeds.

LaserMaster says that in addition to using a traditional halftoning method, the PressMate will incorporate stochastic screening—a more precise technology designed to eliminate moirés. Output speed will be about 10 minutes for each 12-by-18-inch color panel of a four-color separation. And while some service bureaus charge $80 to $150 for four-color separations, PressMate material costs will be about $30 for the same job, the company says.

Although the PressMate-Unity combination could produce an entire four-color magazine with little if any compromise in quality, according to a LaserMaster spokesperson the system will most likely be used for ads, direct-mail pieces, brochures, and annual reports.

The Unity 1800PM-R, which is scheduled to ship in early September, supports output up to 12 inches by 19½ inches. The printer includes 48MB of RAM and 40K of fast-cache memory. LocalTalk, parallel, serial, and Ethernet support is included. The PressMate is expected to ship in October. LaserMaster, 612/944-9330.—J.A.M.

The Stock Market Soars

NEED QUICK, EASY ACCESS TO STOCK photos and background textures? If so, there's a variety of new CD-ROM image collections and browser catalogs that offer anywhere from 100 to over 1000 images. Here are some of the latest releases.

• Letraset's Phototone Unlocking Library is a 19-volume CD-ROM set of photographic backgrounds in more than 40 categories. The $199 purchase price

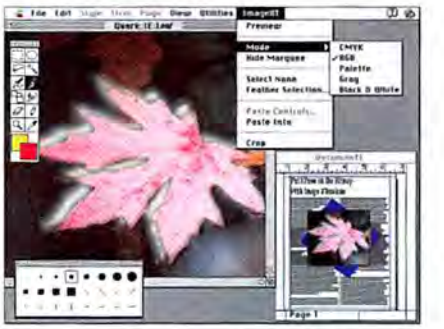
gives you immediate access to the set's 1132 low-resolution (50-dpi) images for browsing and comp purposes only. The set also contains 1132 high-resolution (up to 9.6-by-12-inch, 175-lpi) versions of the same images, which you can download from the CDs for $249 each (usage rights are unlimited). You order an image by filling out a form (included with the CDs) and faxing it to Letraset or an authorized dealer. You then receive a fax containing the electronic code that unlocks the image. Payment options include cash or credit card. Letraset, 201/845-6100.

• Westlight, a stock-photo agency, has announced its Questock Image Search System ($39.95), a CD containing 4500 photographs in Eastman Kodak's low-resolution Catalog format. The photos are for browsing and comps only; any other usage requires licensing from Westlight (the agency offers Photo CD scans and film transparencies of the images). The disc also contains Questock, Westlight's extensive image-searching software, and Kodak Browser, an image-cataloging program. Westlight, 310/820-7077.

• Photo 24, a stock-photo agency, is now shipping its textures on CD. Each disc costs $79.95 and includes 100 backgrounds (in Kodak's Photo CD format), each reflecting a particular theme: Flowers and Leaves, Skies, Walls, and Water are the first four discs. Future themes include Fabric, Food, and National Parks. Photo 24, 818/999-4184.—J.A.M.

Edit Your Images in QuarkXPress

NOW YOU CAN MAKE THOSE INEVITABLE last-minute alterations to images after they've been placed in QuarkXPress—without going back to your image-editing program. ImageEditor, ImageEfxts, and ImageBalance from PictureWorks Technology provide a range



ImageEditor lets you manipulate graphics from within QuarkXPress.

of editing options—including paste and color controls—previously available only in full-blown programs like Photoshop.

With ImageEditor, you can change existing images or add new ones with tools such as the airbrush, paintbrush, smudge brush, and pencil; brush options include Sizes/Shapes, Fade, Pressure, and Hue Only. You can make rectangular, elliptical, or magic-wand selections or use the lasso selection tool; selections can be feathered or masked. The Paste Controls dialog box lets you control such effects as opacity and the colors in both the underlying and floating selections. In addition to supporting RGB, CMYK, Grayscale, Palette Color, and Black/White modes, ImageEditor lets you view an image's color values in RGB or CMYK. You can also load and save custom colors through QuarkXPress's Color Picker.

ImageEfxts provides a variety of filters, including Sharpen, Noise, Outline, Emboss, Darken, and Lighten. It also accepts Photoshop plug-ins.

With ImageBalance, you can fine-tune an image's color and tone by individually altering highlights, shadows, and midtones; changing brightness and contrast; or generating a histogram.

All three XTensions require 4MB of RAM, System 7, and QuarkXPress 3.1 or later. ImageEditor ($249) is expected to ship in late August; ImageEfxts ($129) and ImageBalance ($99) are due in September. They're distributed through XChange, 303/229-0620. PictureWorks Technology, 510/ 735-2910.—CATHY ABES

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600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799

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Dept. D7

Circle 72 on reader service card

Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

Artist: Greg Vander Houwen heads the Seattle-area computer graphics firm Interact, whose clients include Apple and Microsoft. His artwork is featured on the Adobe Photoshop 3.0 CD-ROM.

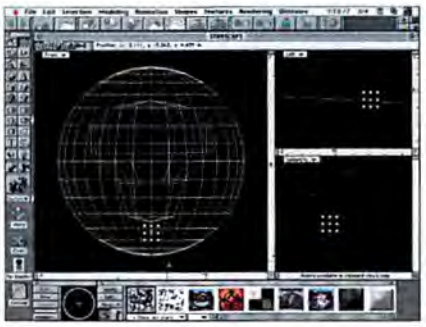
How It Was Done: This image, called *Starscape*, was generated from two simple geometric shapes—a plane and a sphere. The entire model required only one texture map and one light source.

Vander Houwen began in Strata StudioPro by creating a sphere with a light source inside it at the center of his 3-D model. In Photoshop, he created a texture map with scattered white stars, using a star-shaped brush with fairly high spacing and various opacity settings.

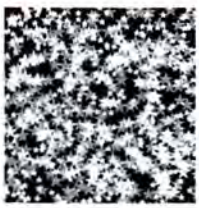
In Strata StudioPro, he combined the stars image with a refractive-glass texture he'd previously made in StudioPro to create a new texture. Below the sphere, he created a plane that tilted toward the viewer. For the final rendering, he placed the camera close to the plane and some distance from the sphere.

Back in Photoshop, he used a mask to lighten the foreground area without affecting the sphere. After saving a duplicate of the image into a new channel, he feathered the sphere, filled it with black, and deselected it to leave a soft black circle. Then he brightened the shadow areas with Curves. After loading that selection into the main image, he lightened it with Curves again. He further adjusted the foreground by saving another duplicate to a new channel and inverting the selection so he could enhance the areas that were originally very dark.

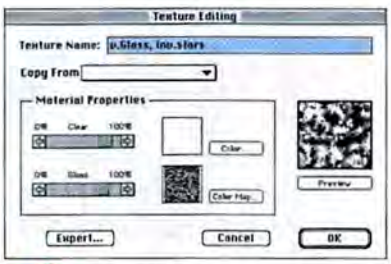
After making the glow mask, Vander Houwen loaded the selection into the main image channel. In Levels, he moved the gamma (center) slider about 20 or 30 points to the left to create the glow effect. He then selected the sphere with a slight feather, floated the selection, and applied the Fragment filter with an opacity of about 70 percent. In Hue/Saturation, he colorized the image by clicking on Colorize, reducing the saturation and moving the Hue slider to the desired blue. ■



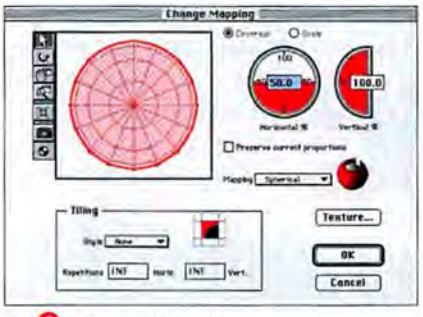
1 In StudioPro, Vander Houwen placed a sphere (onto which he would later map a texture of transparent stars) and a light source in the center of the 3-D environment.



2 To create the stars texture map in Photoshop, he selected a star-shaped brush. In Brush Options, he set the spacing fairly high to put some space between the stars. He also varied the brush opacity to achieve the stacked effect. (He repeated this process with a larger brush.)



3 In StudioPro's Texture Editing dialog box, he clicked on Copy From to load a refractive glass texture he'd made earlier in StudioPro. He combined the glass texture—including transparency, reflectivity, and gloss—with the stars, which he loaded into the map by clicking on Color Map and selecting the stars image.



4 After applying the texture to the sphere, he opened StudioPro's Change Mapping dialog box, set Tiling to None, and made sure that the mapping was set to Spherical and that it completely covered the sphere.

5 By choosing the camera's view and doing a test rendering with ray tracing, Vander Houwen saw that the light source was projecting the stars across the plane. For the final rendering, he increased the resolution.

6 To lighten the foreground, he used Photoshop's Duplicate command to put a copy of the image into a new channel as a mask. There, he made the sphere a feathered selection, filled it with black, and deselected it to replace it with a soft black curved shape. Then he used Curves to brighten the shadow areas to fully select them.

7 In Quickmask mode, he created a vertical blend—white (fully selected) at the top to black (unselected) at the bottom—which he loaded as a selection and filled with black. He loaded the result as a selection into the main image and then inverted its map to make the dark areas in the foreground light.

8 To create the glow mask in a new channel filled with black, he selected the area of the sphere with a feathered elliptical marquee and filled it with white.

THE TOOLS

Hardware: Power Mac 7100 with 40MB of RAM and an FWB Hammer 525MB internal hard drive; Apple 250MB external hard drive; Macintosh 16-inch Color Display with 24-bit color support; Wacom UD-0608-A 6-by-9-inch Pressure-Sensitive Tablet; Hewlett-Packard DeskWriter 560C.

Software: Strata StudioPro 1.1; Adobe Photoshop 2.5.1.

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Special Effects

By itself, Adobe Photoshop is indisputably the most versatile image-editing program for graphics professionals. But combined with third-party plug-in filters from the likes of Aldus, Xaos Tools, and HSC

Software, Photoshop becomes a high-powered special-effects laboratory as well.

Named for the filtered camera lenses that let you zoom, distort, and tint photographs as you shoot them, Photoshop filters extend well beyond anything available to traditional photographers. The third-party filters I evaluated allow you to transform a picture into a series of brushstrokes, wrap images around three-dimensional objects, and generate a never-ending supply of textures out of thin air—to name just a few capabilities.

I worked with nine plug-in special-effects filter packages, ranging in price from $89 to $199. Starting with the filters that are easiest to use and working my way up to the most challenging and capable, I've evaluated each filter package based on how it meets the needs of new and experienced users alike. I've also outlined the pros and cons of each package and even compiled a list of the best individual filters (see the sidebar, "The Top Five Plug-Ins").

While I used these filters with Photoshop, it's important to note that third-party Photoshop filters are usually compatible with any application that supports the Photoshop plug-in format, including Fractal Design's Painter, MicroFrontier's Color It, Pixel Resources' PixelPaint Pro3, Deneba Software's Canvas, Specular International's Collage, Adobe Premiere, Avid VideoShop, CoSA's After Effects, StrataVision 3D, and Ray Dream Designer. But it pays to be safe: if you intend to use a filter collection with a package other than Photoshop, double-check to be sure it's compatible.

Also, keep in mind that, while I tried to be as comprehensive as possible, this article doesn't cover all the third-party special-effects Photoshop filters out there. You'll probably discover some interesting freeware and shareware Photoshop filters if you hunt around. That's because the new version of Photoshop, 3.0 (which should be available by the time you read this), includes Filter Factory, a module that lets expert users create their own custom filters; you can expect to see some of these distributed via online services. For more information on Photoshop 3.0, see *Graphics* news, *Macworld*, September 1994.

ALDUS GALLERY EFFECTS, VOLUMES 1 THROUGH 3

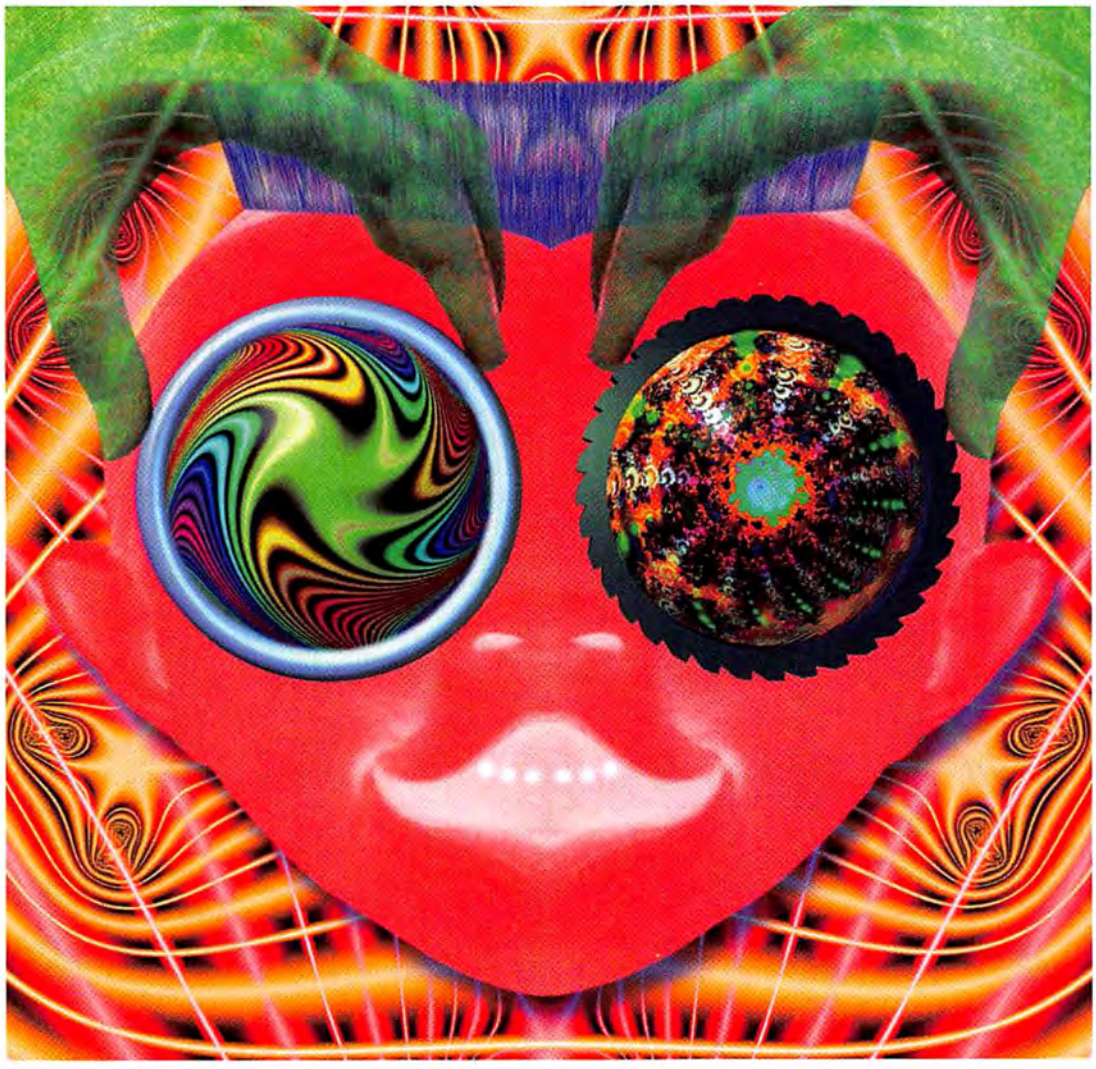
Aldus Gallery Effects from Aldus Corporation (800/685-3570) comprises three separate collections: Volumes 1 ($199), 2 ($99), and 3 ($199). Despite the differences in price, each collection contains the same number of filters (16). The filters produce straightforward effects, such as making an image appear as if it were hand-painted. Each filter includes a preview window so you can apply your settings to a small area of a picture before investing time in filtering the entire selection. Volume 1 also includes a standalone utility for applying filters (helpful only if you don't own Photoshop).

But if I had to describe Gallery Effects in a word, it would be *ho-hum*. The fact is, you can duplicate most of the filter effects using Photoshop's native capabilities. For example, to mimic the GE Emboss filter in Gallery Effects Volume 1—which creates a color embossed effect ostensibly missing from Photoshop—you can enter a sequence of numbers in Photoshop's Custom filter. And emulating the GE Photocopy filter from Volume 2 is as simple as applying the High Pass and Median filters (both supplied with Photoshop) along with some Levels adjustments. The effects are not absolutely identical, but they are extremely close—and in many cases, Photoshop's built-in options are preferable to Gal-

by Deke McClelland

in Photoshop

A buyers' guide to third-party image-editing filters



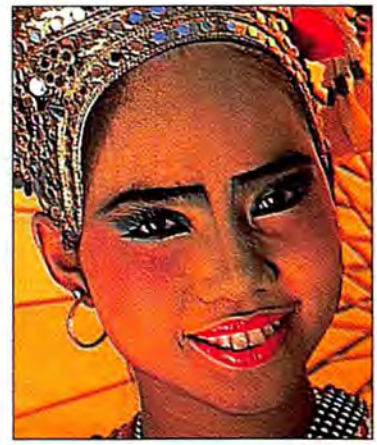
PATRICIA McSHANE/M.A.D.

Among the Kai's Power Tools filters used for this image were the Julia Set options (part of the Fractal Explorer filter) for the eyes and background, and Special Blue Noise for the child's hair.

PAUL DEGREVE/FPG

TRAVELPIX/FPG

Filter Finance *Macworld* paid a stock-photo agency nearly $2000 for usage of the example images in this article. The cost could have been almost double that amount, however, had we not been able to negotiate; the agency initially planned to charge for each use of the woman's photograph that appears in the image "Creating Order within Xaos." The bottom line: Filters can be fun, but unless you're applying them to royalty-free images, they can quickly bust your art budget if you're not careful.



Getting Around Gallery Effects I created the two images at left using Aldus Gallery Effects' GE Emboss filter (top) and GE Photocopy filter (bottom). To get the images on the right, I relied on capabilities built into Photoshop. The left and right effects aren't identical, but the differences are subtle enough to cast doubt on the value of some of Gallery Effects' filters.

lery Effects (see "Getting Around Gallery Effects").

For instance, no matter how you apply Gallery Effects' GE Photocopy filter, you get a gray-scale image with only 16 gray values and little detail. But by using Photoshop's High Pass and Median filters, you retain much of the color and all of the detail of the original image.

Of course, not all Photoshop users are well versed enough to know they can emulate certain effects using built-in filters. To its credit, Gallery Effects names its filters fairly logically and makes them easy to use, providing novices with access to capabilities they didn't know they already had. If Aldus took the next step and made the filters more versatile, the collection might be of more use to intermediate and advanced users as well.

THE BLACK BOX 1.1

From independent vendor Alien Skin Software (919/832-4124)—easily the best name for a software company I've heard this year—The Black Box ($89) is a collection of six filters that add highlights and shadows in and around selection boundaries. For example, one filter creates a drop shadow behind a selection. More-interesting filters generate glass-refraction effects, distort images into whirlpool patterns, and add beveled edges to selection outlines (see "Pressed Text").

Rather than filtering the selected area of an image—the standard operating procedure for most filters—The Black Box plug-ins affect the perimeter of a selection and the area just outside of it. As a result, these filters end up deselecting the selected area, which means you can't composite the filtered image with the underlying original except by reverting to the image you saved to disk or stored in Photoshop's Snapshot buffer. Furthermore, in a version I reviewed (1.1d), using the Undo command didn't completely undo the effect. By using Photoshop's Difference command, I found that colors in and around the selected region remained one to four times darker than they were before the filter was applied. Although this problem was fixed in version 1.1e, I still think it's a good idea to save or take a snapshot of your image before applying a Black Box effect. You'll also want to store your selection as a mask so you can retrieve it for later use.

The Black Box filters are far from perfect. The interface is fairly complicated, and the dialog boxes lack previews. Also, as with Gallery Effects, you can emulate most of The Black Box's filters using Photoshop's native capabilities. But rather than limiting your options—as does Gallery Effects—Alien Skin's collection broadens your range of options and makes complicated tasks more straightforward. As a result, even experienced users will find these plug-ins useful, albeit in need of minor repair.

ANDROMEDA, SERIES 1 AND 2

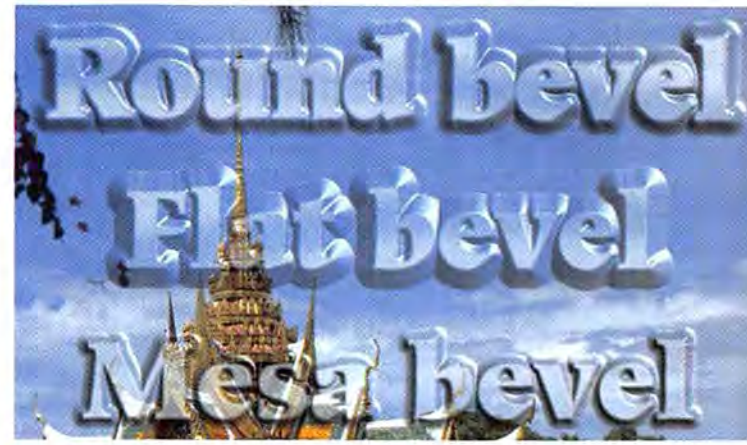
Possibly the most diversified and unusual filter packages come from Andromeda Software (805/379-4109), the same company that programs Adobe Streamline. Andromeda's Series 1 collection, Photography Filters ($129), includes ten plug-ins that

enable you to create everything from automatic rainbows to complex, repeating vector patterns. But while many of the effects are interesting—you can create starburst highlights, rotate repeating images inside the spokes of a circular grid, and apply variations on Photoshop's Motion Blur and Lens Flare effects—it's unlikely that you'll count any of them among your most beloved filters. Except for the mezzo-screen option offered by the Designs filter, Series 1 is a bunch of wacky special effects in search of a practical application.

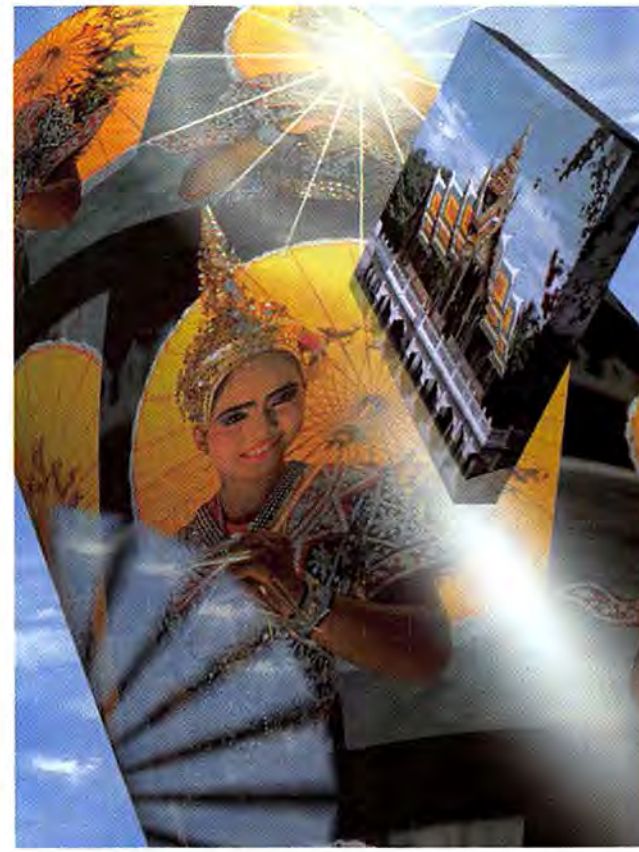
Series 2, Three D Filter (also $129), however, is as pragmatic as a set of socket wrenches. The single Three D Filter plug-in enables you to wrap a selection around one of four three-dimensional forms—a sphere, a box, a cylinder, or a 2-D plane floating in 3-D space (see "The Three D's of Imagery"). Using the program is a bear, though: the interface has more than its share of unconventional controls, and the tiny manual is riddled with 8-point type and punctuated by cryptic headlines—like "3.2.8.2. (Save) Demo Parameters"—that only a robot could understand. But with a little patience and a whole lot of experience, you'll be using this program like a champ.

The options, though complex, are comprehensive. You can scale and spin the 3-D object, wrap and rotate the image around the object, and change the orientation and position of the light source. The preview is large enough so you can accurately judge the outcome of the filter, and you can interrupt the preview at any stage. As for features, my only wish is that the filter could generate its own mask around the finished 3-D object so you could easily composite it against other images. As it is, though, you can set the object against the equivalent of a blue screen and use Photoshop's channel operations to generate a mask.

Suffice it to say that if you've ever wanted to wrap images around 3-D renderings, create photographic cubes, or perform true perspective manipulations, Andromeda's Three D Filter can't be beat.



Pressed Text The Boss filter from Alien Skin's The Black Box package creates embossing effects by adding beveled edges around the perimeter of a selection. I applied the filter using the Rounded, Flat, and Mesa bevel options. Separately, I lightened the characters to make them stand out better.



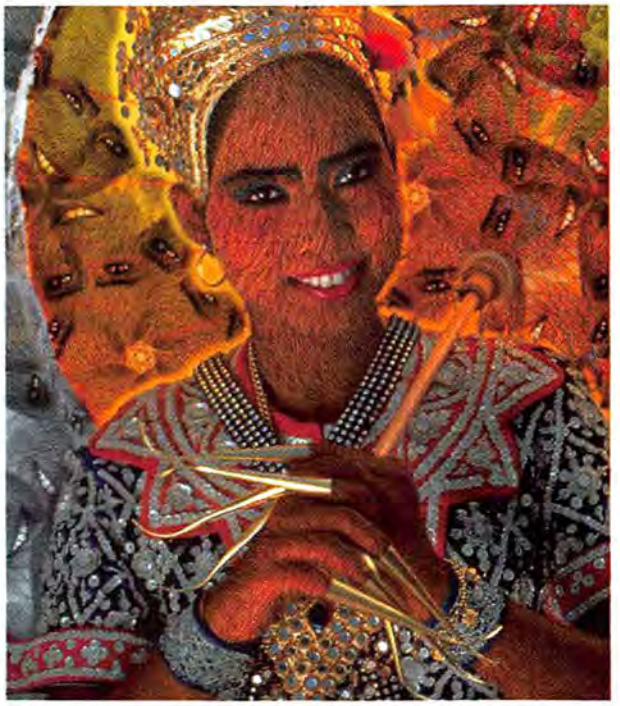
The Three D's of Imagery I used Andromeda's Series 2, Three D Filter, to wrap and repeat the portrait of a Thai woman around a cylinder. I also adhered the temple (upper right) to a thin box. I created the sparkle using the Star filter from the Series 1 collection. The cloudy wedges in the lower left are the result of the Multi filter (also part of Series 1), which duplicates an image in a wagon-wheel pattern.

PAINT ALCHEMY 1.0.2

Paint Alchemy ($99) from Xaos Tools (415/487-7000) is less a collection of filters than a unique image-editing environment that happens to run inside Photoshop. The plug-in repeatedly applies an 8-bit brush shape to the selected portion of an image, resulting in impressionistic and painterly effects. For example, by applying a gradient sliver of a brush to an image, I was able to convert the smooth skin of a woman's face to a complex series of interwoven fibers (see "Creating Order within Xaos").

Any filter this versatile must take a while to master, and Paint Alchemy is no exception. In fact, the interface is complicated enough to put off even seasoned Photoshop users. The filter's single dialog box is made up of five dense panels of options. The preview window doesn't work unless you assign the filter sufficient memory, which is a surprisingly confusing process. You can load only one brush shape at a time, and assigning too little memory can prevent you from doing that as well.

If you manage to come to terms with these and other interface anomalies, you'll tap into Paint Alchemy's virtually limitless reservoir of powerful brush



Creating Order within Xaos I embellished this image using two separate filters from Xaos Tools. The strokes of the fibers on the woman's face and arms are actually 8-bit brush shapes I applied using Paint Alchemy. The strokes rotate according to the hue of the image, and they stretch and shrink based on the brightness. To create the kaleidoscopic pattern of spinning faces in the background, I used a reduced version of the face as a source image inside Xaos's Terrazzo.

Vortex Overload This image features five applications of Kai's Power Tools' Vortex Tiling filter, which spins and duplicates an image into Spirograph patterns. I used the filter to create a mask and pasted the portrait of the woman inside it (upper right). I achieved other effects with the Fractal Explorer, Gradient Designer, Texture Explorer, and Glass Lens Soft filters, all part of KPT.

effects. Paint Alchemy offers 75 predefined brush shapes and gives you the ability to create brushes as well. (A second set of 50 brushes, called Floppy Full of Brushes, sells for $19.95.) You can control the layering, angle, size, and transparency of brushstrokes, as well as randomize their placement. In addition, you can randomize brushes over time when using Paint Alchemy inside QuickTime applications such as Premiere and After Effects. Paint Alchemy doesn't offer the ability to create gradual pattern morphing—which, alas, would be great for turning hairs into crawling worms—but you can move the filter pattern with the QuickTime movie so the pattern doesn't look like a stationary screen.

Xaos Tools plans to release a native Power Mac version of Paint Alchemy before the end of this year. In the meantime, a special version of the program—version 1.02F—accelerates the filters on 680X0 Macs with math coprocessors. Regardless of how long it takes to apply the filter, the result is usually worth the wait. In fact, Paint Alchemy wins my vote as the single most versatile and useful plug-in currently available for Photoshop.

TERRAZZO 1.0

Xaos Tools' other plug-in program, Terrazzo ($199), fills a selection with a repeating pattern from the same image (or another image saved to disk). You can select from 17 duplication symmetries: one positions a right-side-up duplicate next to an upside-down one; another flips the image left, then right, then up, then down; and so on. Pulling off any of these patterns would be next to impossible without Terrazzo.

Inside its dialog box, Terrazzo displays the selected region of your image along with an inset polygon that you can scale and move to surround the portion of the image you want repeated. If you want your pattern to hail from a different image, you can open any PICT file from inside the dialog box. To ensure that the patterns mix smoothly, Terrazzo lets you adjust the feathering applied to each element. A preview window shows the results of your settings.

Terrazzo is useful and flexible, and it's ideal for creating textural backgrounds. But it's not without problems. First, compared with other plug-in packages, it's overpriced. It's about half as powerful as Paint Alchemy, for example, but it costs twice as much. Also, the dialog box badly needs a scale option. As things stand now, you have to reduce or enlarge the source image to change the size of the pattern elements. And the preview constantly tries to update the screen, slowing some editing operations to a crawl. Even if you turn off the Continuous Preview option, Terrazzo tries to sneak in a preview when the mouse is still. A simple Preview Now button would solve this problem. But despite my complaints, I found Terrazzo sufficiently capable to warrant the once-over from any serious Photoshop user. (See *Reviews*, in this issue, for more on Terrazzo.)

KAI'S POWER TOOLS 2.1

I prefer Paint Alchemy to any single filter in HSC Software's (310/392-8441) popular $199 plug-in collection, Kai's Power Tools (KPT). But when you

THE TOP FIVE PLUG-INS

Suppose you're stranded on an incredibly beautiful tropical island. You discover an abandoned beach house stocked with all the amenities of carefree living, including more daiquiris, trash novels, and reggae albums than you can use in a lifetime. There's even a Power Mac equipped with Adobe Photoshop for those occasional times when you've had too much sun. But thanks to some irritating hard disk limitations, you can load only five Photoshop plug-in modules—from absolutely any collection or vendor—onto the computer. Which ones should you choose? If I were you, I'd pick the following filters, listed in order of preference.

1. Paint Alchemy (Xaos Tools). OK, so it doesn't have the best interface on the planet, and its filter performance can be slow. But you can do more with this one plug-in than any other filter I know of. It's nothing short of a special-effects factory.

2. KPT Texture Explorer, part of Kai's Power Tools 2.1 (HSC Software). As its name implies, this filter requires some experimentation. You can't say, "Gosh, I'd like to create a pattern of interlocking turtles," and expect to find them. Rather, you have to play around until you stumble on something that looks like a turtle and then fine-tune it. Even if you never find your turtles, you'll run into a bunch of other patterns that may eventually prove more useful.

3. Andromeda Series 2, Three D Filter (Andromeda Software). Like any three-dimensional rendering environment, Andromeda's Three D Filter takes some time to learn. But once you master its vast supply of options, you'll be able to wrap images around spheres, boxes, and cylinders without the need for more expensive, stand-alone 3-D applications. The renderings are superb.

4. KPT Gradient Designer, part of Kai's Power Tools 2.1. The gradient tool is one of Photoshop's most limited features. KPT Gradient Designer, on the other hand, is the best gradient generator I've seen inside any graphics application. This plug-in allows you to add as many colors as you like, position colors exactly, and mix in translucent gaps.

5. Terrazzo (Xaos Tools). This plug-in repeats a specified portion of an image to form a tile pattern. Terrazzo isn't limited to square upright tiles, like those you see on your Finder desktop every day; it lets you select from 17 different symmetry options and feathers the tiles together seamlessly. The interface needs some work, but the results are first-class.

combine KPT's 37 filters (all accelerated for Power Macs), you get a package that's much more powerful than Paint Alchemy—despite the fact that most of KPT's filters are practical if not particularly exciting variations on Photoshop's built-in filters. For example, you can use KPT to apply several variations on Photoshop's Gaussian Blur, Noise, and Find Edges filters, and the program also supplies filters such as Pixelbreeze for streaking colors across a selection, and Glass Lens for distorting an image inside a sphere.

Vortex Tiling, which repeats an image in spiraling circular formations, is probably the most exciting filter new to version 2.1 (see "Vortex Overload"). With only about ten variations, it's not the most versatile filter on earth, but I had a lot of fun with it.

In addition to its hefty supply of one-shot filters, KPT includes three Explorer plug-ins that make the entire package worthwhile. The Gradient Designer filter lets you create complex, multicolor gradations and apply them either to the interior of a selection or along its outline. You can specify as many colors as you like and request various levels of translucency so the gradient fades in and out of your image.

If you're looking to add wild patterns and backgrounds to an image, the Fractal Explorer generates what seems like an infinite supply of fractal motifs. The filter is fairly daunting to use: you have to painstakingly wander around a mathematical fractal model to find an appealing pattern—much as if you were examining the edges of an insect shell under a microscope. The Fractal Explorer is not everybody's cup of tea, but it can yield some outstanding results.

My favorite KPT filter is the Texture Explorer, which generates repeating tile patterns out of thin air. The tiles are mathematically generated, so there's no need to work from a scanned image (as you must with Terrazzo); yet some of the results are remarkably realistic.

KPT includes hundreds of predefined patterns. You can even colorize patterns using gradations defined in the Gradient Designer. Powerful capabilities plus a carefully designed (though highly unusual) interface make KPT the most extraordinary collection of filters available to Photoshop users.

THE LAST WORD

If you can afford to buy only one filter package, Kai's Power Tools is the one. It includes a handful of focus filters, some noise filters, and a few distortion filters, all straightforward enough to accommodate the new user while remaining stalwart enough to please the experts. And when you finally get around to the Explorer modules, you'll discover a whole new world of image editing—a world as rich and addictive as Photoshop itself.

Those who are looking to bolster an existing library should consider Xaos Tools' Paint Alchemy and Andromeda's Series 2 (Three D Filter). Both are first-rate tools that enable you to perform feats well beyond Photoshop's native capabilities. But be prepared for some complex working environments; it's not that these programs don't make sense, they just require a little experimentation. And if your appetite for plug-ins still isn't satisfied, check out Xaos Tools' Terrazzo and The Black Box from Alien Skin. Neither product is as all-out powerful as my first three recommendations, but both do provide access to unique effects that serious image editors will find useful. **m**

Contributing editor DEKE McCLELLAND is the author of the *Macworld Photoshop Bible* (IDG Books Worldwide, 1994) and the host of "Digital Gurus," a how-to show airing on the Jones Computer Network that covers Photoshop, Painter, Kai's Power Tools, and other graphics programs.

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MACWORLD Expo/San Francisco; January 4–7, 1995

MACWORLD Expo/San Francisco will cover 400,000 square feet of exhibit space at Moscone Convention Center. When you come to MACWORLD Expo/San Francisco, you'll see uses and applications for the Macintosh in a variety of areas including: Networking, Spreadsheet Analysis, Databases, Education, Research, Word Processing, Accounting, Law, CAD/CAM, Forecasting, Design, Publishing, Illustration, Animation, Music, Programming, Entertainment and Multimedia. Plan to be in San Francisco from January 4-7 and experience the Macintosh at its absolute best!

JAMMIN' ON THE INFORMATION HIGHWAY

Keynote Session: Technology visionary Kai Krause has invited several prominent travelers on the Information Highway to join him in a lively discussion of what this long and winding road might lead us to. Confirmed to date (barring any last-minute demands by the entertainment world) are:

Thomas Dolby
Charles Fleischer
Herbie Hancock
Graham Nash
Todd Rundgren

Pre-Registration Savings!

Now is the time to pre-register for MACWORLD Expo/San Francisco. Return the attached pre-registration form with your payment by December 1, 1994 and save $30 on all Conference sessions* and Exhibits ($120 now vs. $150 at the door). An Exhibits-only admission saves you $15 ($25 now vs. $40 cash only at the door). And since your time is as valuable as your money, we'll send your admission badge early when you pre-register. Avoid the registration crowds and get a jump start on the exhibition!

*MACWORLD Expo conference sessions are on a first-come, first-served basis with no guaranteed seating and are subject to change without notice.

THE CONFERENCE PROGRAM

Tomorrow's Innovations Today

Here's a preview of MACWORLD Expo/San Francisco's 14 separate conference programs, from which you can create your own information-rich agenda:

1. The PowerPC Conference.

Everything there is to know about PowerPC — for users, vendors, and developers — including: new capabilities, features, functions, interfaces; compatibility and performance issues; dazzling new software and works-in-progress; upgrading/what to buy when; optimizing performance; next generation plans; new horizons for developers; and more.

2. The Design Conference.

Celebrated Mac designers share creative insights and power-user tips on: color management; creative imaging; prepress; digital photography; new media; digital art; key designer tools; and more.

3. The Entertainment Conference.

The best in the business present tools and techniques for TV, films, and commercial applications, featuring: interactive cinema; QuickTime movies; digital video; music; innovative effects; virtual reality; broadcast quality graphics; and more.

4. The Connectivity Conference.

Enhance communications, maximize networks, and see what's in store for the future with: cross-platform issues, client/server technology, e-mail connectivity, networking Newtons, TCP/IP, remote network connectivity, network management tools, troubleshooting AppleTalk, and more.

5. The Small Office/Home Office Conference.

Whether you're operating a smaller-size company — or running a business out of your home — or doubling the power of your work environment with a remote office in your home, your needs are different than organizations with hundreds or thousands of employees. See how other Macintosh users in home offices and small businesses are solving the kinds of problems that plague you most.

6. The Science/Technology Conference.

The Mac as a critical tool in laboratory and scientific settings, including tips on visualization using QuickTime, scientific data analysis, and virtual reality.

7. The Programmer/Developer Conference.

For in-house developers, veteran independents, and novice Mac techies alike: how to capitalize on the new world of opportunities in programming for Newton and PowerPC — plus valuable insights on AppleScript, OpenDoc, OLE, AppleSoft Solutions Tools, and more.

8. The Education Conference.

Educators share successful Mac experiences with multimedia, CD-ROM, HyperCard, telecommunications, QuickTime, Internet — and students demo their most outstanding in-school and at-home Mac projects in science, math, social studies, desktop publishing, and more.

9. The How-to-Get-Started Conference.

Learn the basics — of Newton, desktop publishing, telecommunications, on-line services, the Internet, design, multimedia, QuickTime, interactivity, and using CD-ROM (to name but a few).

10. The Advanced User Conference.

Veteran users share their expertise and insider's tricks for the most mileage from your PowerBook, customizing your Mac, resolving system conflicts, maximizing 7.5, and hot new ideas galore.

11. The Special Interest Group Conference.

Looking to compare Mac notes with others? Develop an invaluable "user network." Here you'll find sessions on The Mac in the Law Office, Health Care, Government, and MIS; and the perennial favorite MUSE (MACWORLD Expo User Group Extravaganza).

12. Application Workshops.

Intensive training sessions by MacAcademy on: Beginning Macintosh; Intermediate Macintosh; Advanced Macintosh; Macintosh Fonts; Claris FileMaker Pro; Microsoft Word; Aldus PageMaker; Microsoft Excel.

13. The Multimedia Conference.

Create quality productions and presentations with both high-end and low-end multimedia tools. Share insights from the world's most successful multimedia experts on interactivity, desktop video, animation, interface design, authoring tools — and see the profitable impact in education, museums, and more.

14. The CD-ROM Conference.

Want to publish an entertainment or consumer CD-ROM? Start with the Mac. Learn about building successful titles; developing interactive games; content licensing; document conversion and management; search and retrieval; marketing your CD-ROM; and more.

MACWORLD EXPO SAN FRANCISCO

MOSCONE CENTER

Exhibition Hours
January 4-7: 10:00 a.m. - 6:00 p.m.

Conference Hours
January 4-6: 10:30 a.m. - 6:00 p.m.
(No Conferences on January 7)

REGISTRATION FORM

PRE-REGISTER FOR MACWORLD EXPO/SAN FRANCISCO BY DECEMBER 1, AND SAVE $15 TO $30

PLEASE REGISTER ME FOR:

❑ **Package One $120.**
Conference sessions* and exhibits. Pre-register by December 1 ($150 at the door).

❑ **Package Two $25.**
Admission to exhibits only. Pre-register by December 1 ($40 cash only at the door).

❑ **Check if Applicable.**
I'm an international attendee. Please ship my badge by Federal Express. Enclosed is an additional $45.

Please choose your package and fill out the form completely. **Incomplete forms will be returned.** One form per person; make photocopies for additional people. Registration forms received after December 1 will be returned unprocessed. Purchase orders cannot be accepted. **All registration fees are non-refundable.** A $20 fee will be charged for all returned checks. Send completed forms to:

MACWORLD Expo/San Francisco
P.O. BOX 4010
DEDHAM, MA 02027

U.S. BADGES: Mailed on or around December 16.
INTERNATIONAL BADGES (Including Canadian): Held on-site at the International Pre-registration counter

Badge Pickup hours are:
January 3, 11:00 a.m. - 4:00 p.m.; January 4-7, 9:00 a.m. - 6:00 p.m.

Please send my registration badge and further information to:

Please check one: ❑ Home Address ❑ Company Address

First Name ___/___/___/___/___/___/___/___/___/___/___/___/___/ M.I. ___/ Last Name ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/

Street Address ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/ ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/

City ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/ State ___/___/ Zip Code ___/___/___/___/___/-___/___/___/___/

Country (Other than U.S.) ___/___/___/___/___/___/___/___/___/___/ Telephone ___/___/___/-___/___/___/-___/___/___/___/

If mailing to company address: *(If mailing to your home address, leave the next two lines blank).*

Title ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/

Company ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/ ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/

❑ Check enclosed (make payable to MACWORLD Exposition) Amount $ _____

❑ Master Card ❑ Visa ❑ American Express Amount $ _____

Account Number ___/

Expiration Date (include all numbers) ___/___/ ___/___/

Card Holder Signature (Signature necessary to be valid) _____

If card holder is other than registrant, please print card holder's name below:

First Name ___/___/___/___/___/___/___/___/___/___/___/___/___/ M.I. ___/ Last Name ___/___/___/___/___/___/___/___/___/___/___/___/___/___/___/

Cash only at the door. After December 1, you must register at the show.

Please check the appropriate information:

YOUR INDUSTRY OR PROFESSION *(choose only one)*

1. ☐ Accounting/Finance
2. ☐ Architecture/Construction
3. ☐ Art/Design/Creative Services
4. ☐ Arts & Entertainment
5. ☐ Communications/Printing/Publishing
6. ☐ Computer Reseller/VAR/VAD
7. ☐ Consulting
8. ☐ Corporate/General Management
9. ☐ Distributor/Dealer/Retailer/Service
10. ☐ Engineering/R&D
11. ☐ Government/Military
12. ☐ Health/Medical Services
13. ☐ College/University
14. ☐ Elementary/High School
15. ☐ Legal Services
16. ☐ Manufacturer (Computer Industry)
17. ☐ Manufacturer (Non-computer Industry)
18. ☐ Marketing/Sales/PR/Communications
19. ☐ Other
20. ☐ Does Not Apply

YOUR TITLE *(choose only one)*

21. ☐ CEO/President/VP
22. ☐ Controller/Treasurer/Accountant
23. ☐ DP/MIS Manager
24. ☐ Network Manager
25. ☐ Programmer/Analyst
26. ☐ Engineer/Scientist/R&D
27. ☐ Manager/Department Head
28. ☐ Professional (Lawyer, Doctor, etc.)
29. ☐ Consultant
30. ☐ Marketing/Sales
31. ☐ Educator
32. ☐ Art Director/Graphics
33. ☐ Editor/Writer
34. ☐ Student
35. ☐ Other
36. ☐ Does Not Apply

SIZE OF YOUR ORGANIZATION *(number of employees national & international - choose only one)*

37. ☐ Under 50
38. ☐ 50 - 99
39. ☐ 100 - 499
40. ☐ 500 - 999
41. ☐ 1,000 & over
42. ☐ Does Not Apply

WHICH PERSONAL COMPUTER(S) DO YOU OWN/USE? *(choose all that apply)*

43. ☐ Macintosh Plus/SE/SE30
44. ☐ Macintosh Classic Series/LC Series
45. ☐ Macintosh Powerbook Series/Duo Series
46. ☐ Macintosh II Series
47. ☐ Macintosh Performa Series
48. ☐ Macintosh Centris Series
49. ☐ Macintosh Quadra Series
50. ☐ Macintosh Workgroup Series
51. ☐ PowerMAC
52. ☐ IBM PC or compatible
53. ☐ Other
54. ☐ None

DO YOU RECOMMEND, BUY, OR APPROVE MICROCOMPUTER SOFTWARE AND/OR PERIPHERALS?

55. ☐ Yes
56. ☐ No

IF YES, PLEASE INDICATE FOR HOW MANY MACINTOSH COMPUTERS YOU HAVE THIS INVOLVEMENT.

57. ☐ 1 - 10
58. ☐ 11 - 25
59. ☐ 26 - 50
60. ☐ 51 - 100
61. ☐ 101 - 500
62. ☐ 501 +

*MACWORLD Expo conference sessions are on a first-come, first-served basis with no guaranteed seating and are subject to change without notice.

NOV

All registration fees are non-refundable. Send completed form with payment to: MACWORLD Expo, P.O. Box 4010, Dedham, MA 02027. For overnight packages ship to: 260 Milton Street, Dedham, MA 02026.

ATTENDING MADE EASY

MACWORLD Expo/San Francisco 1995. Moscone Convention Center, 747 Howard Street, San Francisco, CA. January 4-7, 10:00 a.m. - 6:00 p.m.

U.S. Attendees.

Badges will be mailed on or about December 16. Be sure to check box indicating where badge should be sent.

International Attendees.

International Badges (including Canadian) will be held for pick-up at the International Pre-registration counter at Moscone Center. Badge Pickup hours are: January 3, 11:00 a.m. - 4:00 p.m.; January 4-7, 9:00 a.m. - 6:00 p.m. For Federal Express service, check the appropriate box on the pre-registration form and add $45 to your pre-registration fee. Fill in your exact street address (no P.O. boxes) and include your telephone number and country code. We will Federal Express your badge directly to you.

Fly American Airlines and Save.

Enjoy savings on applicable fares when you fly American Airlines, the official airline of MACWORLD Expo. American is offering attendees discounts of 5-10% on most fares. Dial 800-433-1790 to speak with an American Airlines reservationist and reference Star File #SØ1D4AL. Savings are available on applicable fares only.

Car Rental Discounts From Alamo.

Alamo Rent a Car has been appointed the official car rental company for MACWORLD Expo/San Francisco and special discounted rates have been extended to attendees. These rates are available one week before and after the meeting dates and include unlimited free mileage. To make reservations call Alamo at 1-800-732-3232 and request group I.D. #382751 and rate code GR. Advance reservations are required.

Hotel Accommodations

Participating hotels in the San Francisco area are offering MACWORLD Expo discounts. To receive the preferred rate, call one of the hotels listed and mention you'll be attending MACWORLD Expo. There are only a limited number of rooms at the preferred rate and they sell-out quickly. Make your reservations by November 30 for the best selections (rates and availability cannot be guaranteed). Prices reflect single and double occupancy. If you are reserving 10 or more rooms, you must supply the hotel with a rooming list and a non-refundable deposit for the first night, no later than November 18.

Save Up to $30 Pre-Register by December 1!

Save $15 - $30 on your Expo package when you pre-register by December 1. We'll send your badge early to help avoid the crowds.

Hotel	Single/Double	Telephone
ANA Hotel 50 Third St., San Francisco, CA 94103	$149/149	(415) 974-6400
Fairmont Hotel 950 Mason Street, San Francisco, CA 94108	$105/105	(415) 772-5000
Four Seasons Clift Hotel 495 Geary St. at Taylor, San Francisco, CA 94102	$150/160	(415) 775-4700
Grand Hyatt 345 Stockton St., San Francisco, CA 94108	$142/142	(415) 398-1234
Holiday Inn Civic Center 50 Eighth St., San Francisco, CA 94103	$99/114	(415) 626-6103
Holiday Inn Golden Gateway 1500 Van Ness Ave., San Francisco, CA 94109	$69/79	(415) 441-4000
Holiday Inn Union Square 480 Sutter St., San Francisco, CA 94108	$120/120	(415) 398-8900
Hotel Nikko 222 Mason St., San Francisco, CA 94102	$138/154	(415) 394-1111
Hyatt Regency San Francisco 5 Embarcadero Center, San Francisco, CA 94111	$139/169	(415) 788-1234
King George Hotel 334 Mason St., San Francisco, CA 94102-1783	$102/112	(415) 781-5050
Orchard Hotel 562 Sutter Street, San Francisco, CA 94102	$90/95	(415) 433-4434
Parc Lane's Parc Fifty-Five 55 Cyril Magnin St., San Francisco, CA 94102-2865	$125/125	(415) 392-8000
Ramada Hotel at Fisherman's Wharf 590 Bay Street, San Francisco, CA 94133	$90/95	(415) 885-4700
San Francisco Hilton 333 O'Farrell Street, San Francisco, CA 94102	$135/145	(415) 771-1400
San Francisco Marriott 55 Fourth Street. San Francisco, CA 94103	$164/184	(415) 896-1600
Sheraton Palace Hotel 2 New Montgomery St., San Francisco, CA 94105-3402	$152/172	(415) 392-8600
Sir Francis Drake Hotel 450 Powell St., San Francisco, CA 94102	$125/135	(415) 392-7755
Stouffer Stanford Court Hotel 905 California Street, San Francisco, CA 94108	$129/129	(415) 989-3500
Westin St. Francis 335 Powell St., San Francisco, CA 94102	$137/137	(415) 397-7000

Services for the Physically Challenged.

We're committed to ensuring that our physically challenged attendees receive all the services they need to make their visit enjoyable. Call us at 800-945-3313 for details.

Pre-recorded Information.

For pre-recorded information about MACWORLD Expo/San Francisco, call the MACWORLD Expo Information Hotline at 617-361-3941. 24-hours a day, seven days a week.

Early Bird Registration.

Missed the pre-registration date? You can still register before the start of the show! On-site Early Bird Registration is from 11:00 a.m. - 4:00 p.m. on January 3 at the full registration rates of $150 for all Conference Sessions and Exhibits, and $40 (cash only at the door) for Exhibits-only admission.

Take the Shuttle and Enjoy the Free Ride.

Complimentary shuttle service is available from the Cow Palace and Cal Train. Look for specifics in your pre-registration package. Moscone Center is accessible from 80 East, 4th Street Exit; from the Bay Bridge, Fremont Street Exit; and from Golden Gate, Lombard Street Exit. Call 415-974-4000 for detailed directions.

MACWORLD EXPOSITION

EDITED BY DAN LITTMAN

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

Quicken 5 Puts Money under Microscope

THE BIGGEST CHANGE IN VERSION 5.0 of Intuit's personal-finance and small-business bookkeeping package Quicken is a great increase in ways to look at your financial picture. For example, the program can show cash flow, bills coming due, and so on, in a calendar view; you can open and modify transactions (including recurring transactions) from the calendar; and you can add an individual financial event, such as a vacation or an estimated tax payment, to a financial-forecast time line to see its impact. Creating reports is also simpler than in version 4.0.

Quicken 5.0 borrows some tax capabilities from MacInTax, which Intuit acquired last year when it bought Softview, and it can categorize transactions for tax purposes and later transfer them to MacInTax. The new version of Quicken puts frequently used commands on an icon bar, lets you see and edit its list of memorized transactions, and can log on to CompuServe to download current securities prices. Quicken 5.0 should ship in October at $49.95; the upgrade from 4.0 is $29.95. Intuit, 415/322-0573.—D.L.

New Homes for Documents

PC DOCS AND THE RECENTLY ACquired WordPerfect subsidiary SoftSolutions, two leading vendors of electronic document-management systems, are developing Mac clients.

SoftSolutions' standard fields for profiling documents, where the user adding documents to the archive records topic, author, and other information, are static, but the profile includes 16 user-definable fields. SoftSolutions sells Windows and DOS add-ons for recording document usage, creating a custom interface, and other functions; the company has not decided which add-ons it will develop for the Mac. The Mac client should ship this year. Pricing was not set at press time. SoftSolutions, 801/226-6000.

PC Docs' Docs Open runs on any standard SQL database engine and provides a point-and-click interface for adding or modifying fields in the document profile. The administrator can set up controls requiring users to fill in certain fields. Docs Open can read and index data from about 150 common applications and can search the contents of documents as well as their profiles. The system's distinguishing feature is Check Out, which allows a user to work on a document offline and temporarily block other users from modifying the document. The ship date for the Mac client is expected to be in the first quarter of 1995. It lists for $295; volume purchases are less per user. PC Docs, 904/942-3627.—D.L.

DCA Takes On Lotus Notes

A NEW GROUPWARE SYSTEM UNDER development by a company previously known for mainframe connectivity products takes a different approach from that of Lotus Notes to gathering and sharing information.

DCA's OpenMind combines document archiving with group-discussion management; OpenMind indexes docu-

ments loaded into the system (DCA says OpenMind reads about 150 file types), and users can search using Boolean and proximity operators. You can navigate discussions—about indexed documents as well as unrelated topics—in the Transcript view, which shows the first line of each comment, supports threading and branching, and can notify participants in a discussion when new comments are added.

DCA's group-discussion manager, OpenMind, can display the first line of each entry in a threaded series of comments.

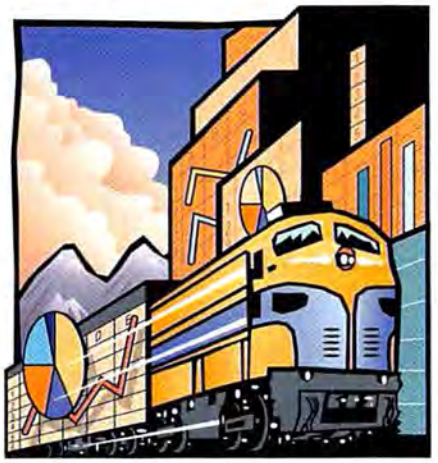
OpenMind is designed to be used with a modem or other remote-access tool, as well as on a LAN. It requires a Windows NT server, which lists for $995 and should be shipping by the time you read this; the Macintosh client should ship in October, and client pricing starts at $295 per user and drops to $225 per client for large purchases. DCA, 404/442-4495.—D.L.

Mac's Spreadsheet World Diversifies

A NEW SPREADSHEET WITH light hardware demands and a curious history will ship soon. U.S.-based Mariner Software's Mariner has long been available here as shareware; with help from a Japanese distributor, it was perfected for commercial sale in Japan and is now heading for the U.S. commercial market. It will list for $99 and be available late in 1994.

Mariner 3.05, the current beta version, isn't meant to challenge Microsoft Excel: it runs comfortably in 1MB of memory and takes up only 600K on disk. However, it provides one thing Excel can't touch: true 3-D worksheets—that is, the ability to arrange and manipulate data in rows, columns, and layers. Mariner creates graphs and provides 102 functions for math, trig, finance, statistics, time and logical operations, and manipulating worksheet objects. Other useful features include a set-print-area command, dynamic headers and footers, table-formatting templates, and tiling or cascading of open windows. When Mariner ships it will support drag and drop and have a spelling checker. Mariner lacks array manipulation and a macro language; the program can import SYLK files but not native Excel files.

The company is also anglicizing its unnamed Japanese word processor, which the company says is on a par with WriteNow. It should ship by year's end for $99. Both programs will be available in 680X0 and native Power Mac versions. Mariner, 502/222-1308.—D.L.



Where Paper Goes When It Dies

WHAT TO DO WITH ALL THOSE OLD papers? You know, those bankers' boxes full of personnel memos and IRS documents from 1980? Why, throw them in the recycling bin, of course—after converting them to electronic format.

Systems Engineering Solutions (SESI) is shipping Imaxis, a system for creating electronic archives from paper documents (Imaxis archives can also include documents created on a computer). Imaxis integrates tools for scanning documents, cataloging and annotating them, extracting their text, and finding the documents again when you need them. The interface is designed to make it easy to reproduce your office's filing system, and users can browse through files, search by document content or catalog information, and set bookmarks. Imaxis also provides a hierarchical security system for controlling the ability of individuals and groups to see or alter sets of documents.

Imaxis is geared toward small workgroups: it lists for $2695 for one server and one scanning module with four client modules—about one-tenth the cost of BlueRidge's Optix and Microdynamics' MARS, two Mac systems designed for larger installations. Imaxis components are available separately for later expansion. SESI, 703/573-4366.—D.L.

IN BRIEF

Arrange Rearranged The personal-information-manager construction kit Arrange has been revised to version 2.0 with new features that increase its flexibility. To the way Arrange stores information in user-defined, interwoven, hierarchical lists—containing contact names, appointments, to-dos, and so on—Arrange 2.0 adds calendar views and user-designed form views. Common Knowledge has also made Arrange's programming interface available, and the company says third-party developers are coding add-ons for version 2.0; one of the first to ship will be a calculation engine for use in time billing and other applications that take advantage of the forms-design tools. Arrange 2.0 lists for $349. Common Knowledge, 415/325-9900.

WordPerfect Fax Software Novell subsidiary WordPerfect is developing a fax-and-data-communications package designed to work with standard modems and fax modems. ExpressFax Plus 3.0 can forward incoming faxes to another fax device; automatically print an incoming fax or convert it to text with the built-in Xerox TextBridge optical character recognition engine; combine multiple documents in a single fax document; and schedule a queue of faxes for delivery at specified times. It will list for $109 and should ship in September. WordPerfect, 801/225-5000.

"The best online trading software I've seen."

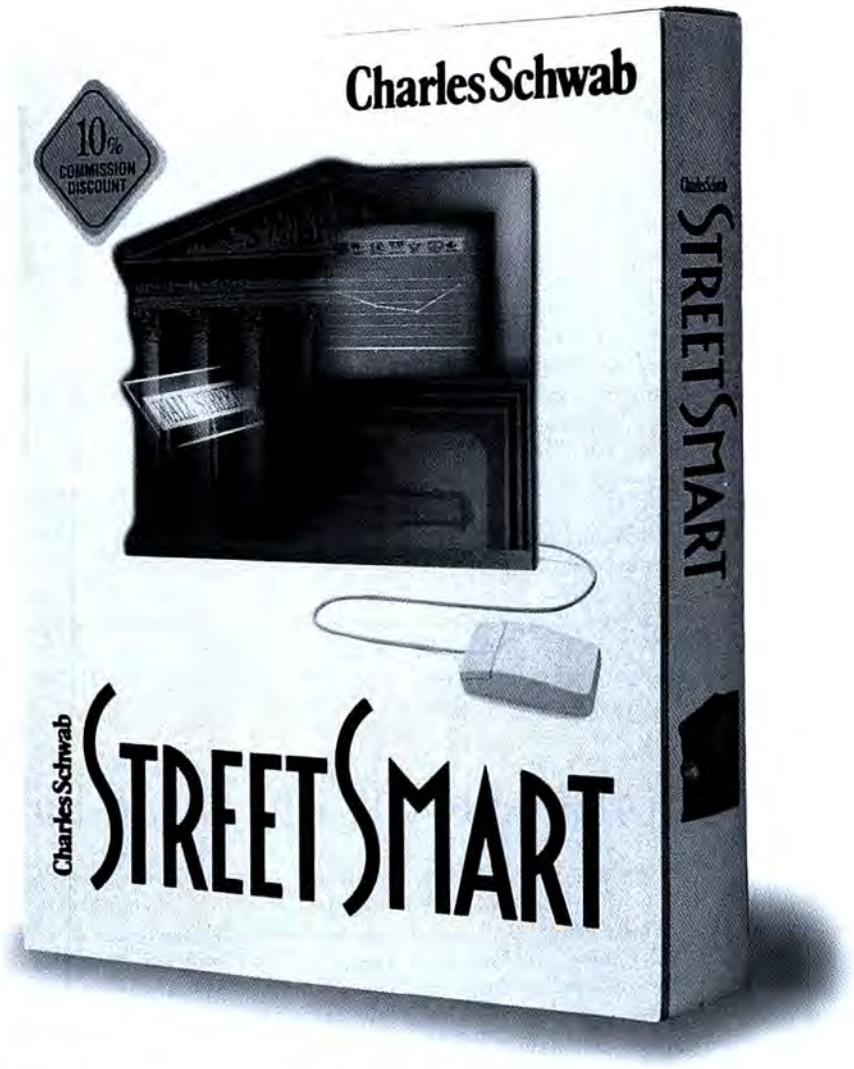
– Walter Mossberg, *SmartMoney* (2/94)

"The newest, brightest and jazziest brokerage software."

– *Forbes* (6/20/94)

"A pioneer of electronic investing."

– *Newsweek* (6/6/94)



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BY JIM HEID

Working Smart

Tools and Tips for Printing Labels

REMEMBER THE DYMO LABEL MAKER? It first flashed across the consumer-product sky in the 1970s. It was shaped like a science-fiction ray gun, with a dial gizmo on top bearing all the letters of the alphabet. You dialed a character, squeezed the plastic trigger, and the Dymo embossed the character on adhesive-backed plastic tape. After a few minutes of dialing and squeezing, you had a peel-and-stick label. It was state of the art back then, especially when Dymo came out with colored tapes, including one with a handsome faux wood-grain look.

Today's label maker comes with a mouse, keyboard, and printer connected to it. Any Mac attached to a printer can produce a wide range of label types—mailing labels, videocassette labels, "Hello, my name is" badges, and more. To spare you from frustrating trials and errors and wasted label stock, many application programs include templates for popular label sizes. There are also dedicated label programs and small, inexpensive label printers that free up your big printer for bigger things (see "Little Label Printers").

Software for Labels

Current versions of Aldus PageMaker, Claris FileMaker Pro, ClarisWorks, Microsoft Word and Works, and Softkey International's WriteNow, among others, include templates for labels by Avery (909/869-8514, 800/462-8379), the biggest supplier of printer label stock. All mailing list programs—packages such as Satori Software's Bulk Mailer Plus and Software Publishers' AccuZip6—also provide direct support for common mailing and shipping label sizes. (See the March 1994 *Working Smart* for details on mailing programs.)

Then there are dedicated label-printing programs, which combine basic page-layout features with built-in templates for label stocks, such as Avery's own MacLabelPro 1.63 ($99.95); Williams & Macias's $100 StickyBusiness 1.6.4 and $225 StickyBusiness Plus 1.6.4 (509/624-5170, 800/752-4400); and MySoftware Company's $29.95 MyLabelDesigner 1.0.1 and $59.95 MyAdvancedLabelDesigner 1.5 (415/473-3600, 800/325-3508). StickyBusiness and StickyBusiness Plus are identical except that Plus supports bar codes; MyLabelDesigner and MyAdvancedLabelDesigner are also similar, but Advanced has a built-in database.

All labeling programs work similarly. You select from a menu the type of label you want to create; labeling programs make this easy by describing the label stocks that they support, including brand names and part numbers. Some programs support a much wider range of label stocks than others. For understandable reasons, Avery's MacLabelPro supports only Avery label stocks (even though MacLabelPro is based on a 1990 licensed version of StickyBusiness). The MySoftware programs include slightly more than 100 templates, while the StickyBusiness programs are the reigning template champs, with more than 500 templates for Avery labels and stock from other suppliers. These include New England Business Services, a large mail-order supplier of preprinted labels, invoices, and other business forms (508/448-6111, 800/882-5254); Inmac, a mail-order office- and computer-supply house (214/255-4000, 800/547-5444); and even United Parcel Service.

Laying Out Labels

After you specify a label size, the program provides a blank label and tools for creating text, lines, and boxes. The MyLabelDesigner and StickyBusiness programs import PICT and EPS graphics files; you can also paste graphics from the Mac's Clipboard. You might use these features to add a company logo or a scanned image to labels. The StickyBusiness packages can import icons to adorn labels for disks or removable-media labels.

These programs' layout features are crude compared with those of a desktop publishing program. Forget about fine control over letterspacing, for example, or even grouping objects to move and resize them together. MyLabelDesigner and MyAdvancedLabelDesigner have additional limitations; for instance, they provide just three line widths and don't support diagonal lines. But at least the MyLabelDesigner programs let you zoom in on a design to do detailed work; StickyBusiness doesn't.

Specialized Labeling Features

However, most programs provide more than bare-bones layout features and templates. MyAdvancedLabelDesigner has a built-in database manager that's suitable for keeping track of mailing lists, and both of the MySoftware programs can import text-only files from a database manager. StickyBusiness lacks a built-in data man-

continues

ager but provides a print merge feature.

As you might expect, a label program's real prowess is printing, with features designed to cut down on wasting labels and to make printing labels easier. For example, if you print just a few labels, you'll be left with a partially used label sheet; these programs can skip blank spots on a sheet and use up the remaining labels. Label programs also let you print multiple copies of the same label. All the programs tested can print a unique serial number on each label—a great feature for use in inventory or forms.

Williams & Macias also sells myDiskLabeler III (version 3.2.4, $80), with layout features similar to those of StickyBusiness but with templates only for floppy disks, SyQuest cartridges, and other storage media. myDiskLabeler III reads the directory of a disk or cartridge and prints its contents on a label and in report format (see "Labels for Disks"). Williams & Macias sells laser-printer SyQuest labels and other label stocks, as does MySoftware Company.

Choosing a Labeling Program

If you print only a few labels now and then and you already have a program that includes label templates, you might not need stand-alone label software. But if you do, get one of the StickyBusiness packages from Williams & Macias. They support the widest array of label stocks, they provide the best layout features, and the programs themselves are easier to use and better designed than MySoftware's packages. Both StickyBusiness packages also include a desk accessory, QuickStick, that lets you dash off a quick label.

As I worked on this month's column, I wondered if label-printing programs represent The Software Category That Time Forgot. All the programs tested have a circa-1986 feel to them: no 3-D tool palettes, balloon help, or customizable user interfaces here. The StickyBusiness manual even has instructions on importing data from Microsoft's Multiplan spreadsheet, which was discontinued years ago. All the programs are compatible with System 7 and even the Power Macintoshes, but I wouldn't mind seeing them modernized.

But to their credit, all these programs run on a Mac Plus or SE and don't gobble gobs of hard disk space. In an era when more and more programs arrive on a dozen floppies, or even a CD-ROM, it's refreshing to install a program that comes on just two 800K disks. And hey, even a circa-1986 labeling package beats a circa-1970 Dymo Label Maker.

Stock You Can Stick With

Labeling software won't do you much good without labels to print on. There are many kinds of label stock available for computer printers, but be careful not to buy labels designed for typewritten or hand-written labels: they won't withstand the heat and curving paper paths of most printers, and you may end up with a gummy, expensive mess to repair.

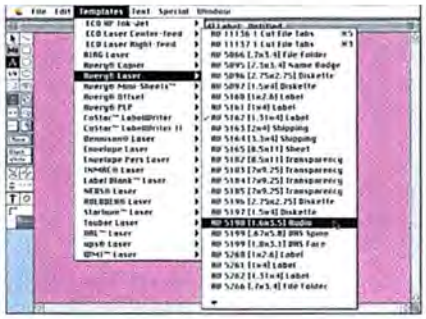
Avery puts laser labels on an 8½-by-11-inch backing that fits in the standard paper cassette for most laser printers. The labels themselves range in shape and size from ½-inch-by-1¾-inch rectangles (80 labels per page), to 3⅓-inch circles (6 per page), to full sheets measuring 8½ by 11 inches. The full-sheet labels are especially versatile, since they can be cut to any size after printing. All of Avery's white-label stock also works with ink-jet printers such as Apple's StyleWriter II. For laser printers only, Avery also offers pastel-colored stocks in various sizes, as well as see-through labels.

If you want your labels to make a fashion statement, get a catalog from PaperDirect (201/271-9300, 800/272-7377). This mail-order firm is the best source I've found for offbeat paper and label stocks. The company's Designer Laser Labels line comes in more than a dozen styles—everything from billowing clouds to geometric borders to faux marble—and PaperDirect also sells paper and folders that match its labels. A box of 20 sheets (120 labels) is $19.95.

Even more stunning is PaperDirect's Laser ColorStick line, brightly colored full-sheet label stocks. The Electrix and FireBrites lines come in pink, canary yellow, and something called Bermuda Blue, but my favorite is the Metallic series: glittering gold and silver for plaques, door signs, proposal binders, and other special jobs. A box of ten is $16.95. Avery and PaperDirect also have labels for videocassettes and audiocassette tapes.

For high-volume jobs, you should use an ImageWriter II or other dot matrix printer instead of tying up a laser printer or waiting for a sluggish ink-jet machine. Dot matrix printers don't deliver typeset-quality, but they have their own advantage: you can use fanfold label stock

Labels for Disks With Williams & Macias's myDiskLabeler III, you can make labels and inserts for disks and other removable media. It works similarly to a mail merge program, except that it prints information about each disk on the label.



Creating Labels Creating a label begins with selecting the desired template. Williams & Macias's StickyBusiness provides the largest array of label templates: more than 500.

LITTLE LABEL PRINTERS

To avoid tying up your main printer with labeling jobs, consider a dedicated label printer such as the Smart Label Printer Plus (pictured here at right; $199.95; Seiko, 408/922-5800, 800/888-0817) or the LabelWriter XL (at left; $249.95; CoStar, 203/661-9700, 800/426-7827). The Seiko machine prints on 1⅛-by-3½-inch roll-fed labels, while the CoStar machine prints larger labels—up to 2¼ by 4 inches—and has vastly superior software that provides basic mailing list–management features, support for bar codes, and a serial-number feature.

ROBERT PERRY

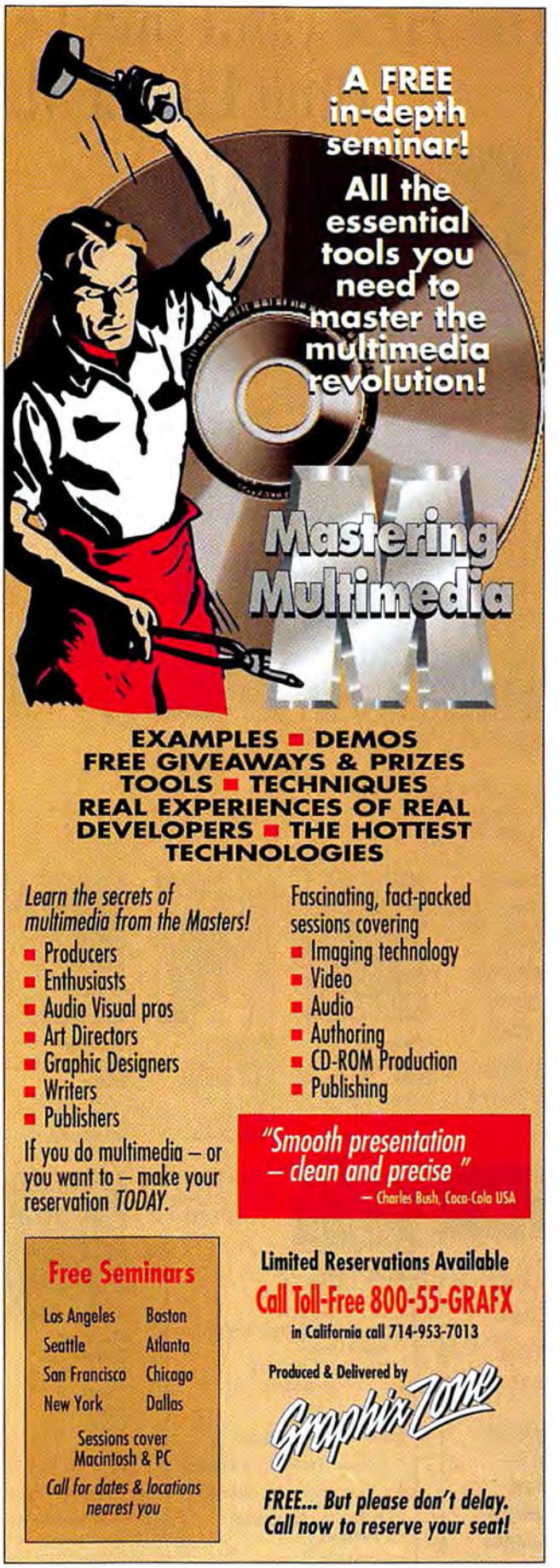
LABEL-PRINTING TIPS

- **ImageWriter II** When using fanfold label stock, never wind the paper-feed knob backward. A label may peel off inside the printer and stick to internal components. Also, with most fanfold label stocks it isn't necessary to start printing at the top of a page because the distance between labels doesn't change where the stock crosses a page boundary.
- **StyleWriter and StyleWriter II** Apple's ink-jet printers can feed label stocks directly from their paper trays. Because label stock is thicker than paper, however, slide both paper-thickness adjustment levers to the envelope position. (One lever is next to the sheet feeder, and the other is inside the printer, just above the ink cartridge.) When manually feeding labels into an original StyleWriter, use the rear manual-feed slot.
- **Laser printers** Some laser printers, including Apple's LaserWriter II line, can feed label stock directly from their paper trays, which eliminates the need to hand-feed labels. Other laser printers put the stock through too many twists and turns. Double-check with the printer manufacturer before buying if you plan to make labels.
- **Plan ahead** Print a page of labels on plain paper. Superimpose it over a sheet of label stock and hold them up to a bright light to check the positioning and alignment of each label.

(sometimes called continuous-feed or pin-feed stock) to run thousands of labels without reloading the printer. Fanfold label stock is available in most office- and computer-supply stores, and Lyben Computer Systems (810/268-8100) is a good mail-order source, with a variety of sizes, colors, and quantities (up to 20,000 per box). Lyben is also a good source for laser and ink-jet label stocks, not to mention specialty papers and envelopes. **m**

Next month: StyleWriter Tips and Secrets

Contributing editor JIM HEID is the author and producer of *Macworld Complete Mac Handbook Plus Interactive CD*, the third edition of which was recently published by IDG Books Worldwide.



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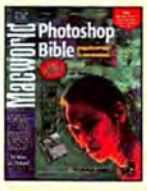

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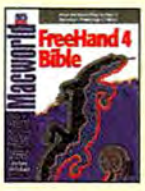

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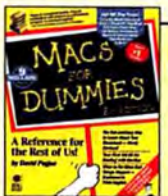

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Quick Tips

Tips, Tricks, and Shortcuts

SYSTEM 7.5'S MENU-BAR CLOCK, WHICH you set with the Date & Time control panel, has a couple of tricks you may not have discovered. For example, you can temporarily hide the clock by holding down the option key and clicking the clock. Option-click the same spot again to reveal the clock. In addition, you can put a PowerBook to sleep quickly by pressing the control key while clicking the battery indicator in the menu bar.

Otto P. Kamsteeg of Almere-Stad, The Netherlands, incited me to investigate these System 7.5 tricks when he reported the control-click trick for SuperClock, the free system extension (available from user groups and online information services) on which System 7.5's clock is based. Both control-click and option-click work with SuperClock and are described in its documentation.

Modems on Digital Phone Lines

Q. We want to get a fax modem, but we've been warned that our phone lines are powered. Must we add an unpowered phone line, or is there a device that would protect the fax modem?

Terence Curtis
San Jose, California

A. There are two types of telephone lines: old-fashioned analog and newfangled digital. Most modems and fax modems are analog devices and don't work with digital phone lines, which carry voltage and current levels that can damage an analog modem.

You are more likely to have digital phone lines at work or in a hotel—places where digital PBX machines are becoming common—than at home. It can be hard to tell by casual inspection which type of line you have. If in doubt, ask a phone company representative or other person who coordinates installation and service of your phone. Find out whether you can plug a phone from home or an ordinary fax machine into the line you want to use for your modem. If you can, the line is probably analog.

To use an analog modem on a digital line, you need an adapter such as the GlobalSwitch from Global Village Communication (415/390-8379, 800/736-4821). This adapter lets you connect the modem to the phone line at the handset jack—which is sure to be digital—instead of from the wall jack. You can still use the phone for voice calls.

Gamma Correction

Q. I stumbled onto a smiley face in the Monitors control panel by pressing the option key. Then I double-clicked the smiley and got a dialog box containing gamma options (see "Hidden Monitor Options"). What does this mean, and how should I set these options?

Shon Taylor
Salt Lake City, Utah

A. The intensity of color on a video display does not correspond uniformly to the intensity of the electron beam that traces the picture on the video display tube's phosphor coating. Therefore, the computer's video circuitry compensates to provide the most accurate color. This compensation is commonly called *gamma correction*. The built-in video circuitry of color Macs and Apple video cards provides gamma correction for the phosphor composition of Apple's original 13-inch RGB display (the de facto standard for Mac monitors). In addition, the built-in video on some Macs offers alternative gamma-correction methods for users who prefer nonstandard color correction, perhaps to simulate different degrees of paper whiteness. You select one of the available gamma-correction methods in the dialog box you discovered. Changing the gamma correction has no effect on video performance, only on color balance.

If a particular model of monitor has a nonstandard phosphor composition, the manufacturer can provide a gamma-correction method specifically for that monitor and can also offer alternative methods for users who prefer nonstandard color correction. The monitor maker supplies its gamma-correction methods in a monitors extension or in a special control panel that goes in your Control Panels folder; the Mac Operating System automatically installs the alternative methods as options in the Monitors control panel.

Incidentally, the smiling Mac icon designates the start-up monitor on a sys-

continues

DON BAKER

Maximum AV Color Depth

		660AV OR 840AV 1MB OF VRAM		840AV 2MB OF VRAM		POWER MAC AV 2MB OF VRAM	
Color Monitor Type	Screen size (horiz. × vert.)	Mac Graphics Only	Graphics and Live Video	Mac Graphics Only	Graphics and Live Video	Mac Graphics Only	Graphics and Live Video
NTSC	512 × 384	32 bpp	8 bpp	32 bpp	8 bpp	32 bpp	16 bpp
Mac 13", 14", 15", 17", 20"; VGA and SVGA; NTSC	640 × 480	16 bpp	8 bpp	32 bpp	8 bpp	32 bpp	16 bpp
SVGA	800 × 600	16 bpp	8 bpp	32 bpp	8 bpp	32 bpp	16 bpp
Mac 15", 16", 17", 20"	832 × 624	16 bpp	8 bpp	32 bpp	8 bpp	32 bpp	16 bpp
Mac 17", 19", 20"; SVGA	1024 × 768	8 bpp	4 bpp	16 bpp	8 bpp	16 bpp	8 bpp
Mac 20" and 21"	1152 × 870	8 bpp	4 bpp	16 bpp	8 bpp	16 bpp	8 bpp
NTSC flicker-free	640 × 480	NA	8 bpp	NA	8 bpp	NA	8 bpp
NTSC flicker-free	512 × 384	NA	8 bpp	NA.	8 bpp	NA	8 bpp

bpp = bits per pixel; NA = not applicable.

The maximum number of colors you can set on an AV Mac depends on the screen size, the amount of VRAM installed, and whether you're using the VRAM for Mac graphics only or for both graphics and live-video input or output. The number of colors is listed here in bits per pixel; 4 bpp yields 16 colors, 8 bpp yields 256 colors, 16 bpp yields thousands of colors, and 32 bpp yields millions of colors. Some monitors can be set to smaller-than-standard screen sizes and more colors by clicking the Options button in the Monitors control panel.

tem with multiple monitors, and as with the miniature menu bar, you can drag the tiny icon to any monitor depicted in the Monitors control panel.

AV Color Depths

Q. I'm making QuickTime movies from VCR tapes with my 660AV Mac and AV monitor. But when I set my monitor to 32,000 colors, I can't record or play back the movies, even if the movie window is small. Must I put up with 256 colors or buy a 24-bit color-graphics card to get better images?

Kazuhiro Yago
Ann Arbor, Michigan

A. Sorry, but 256 colors is the best a 660AV or 840AV can do on any monitor while you're using the video-input port, although the Power Mac AV models can do better on many monitors (see the table, "Maximum AV Color Depth"). When you record a QuickTime movie or display live video in a window, all the AV Macs split their video RAM (VRAM) fifty-fifty between graphics (the standard Mac display) and video-input. If the video-input port is inactive, all the VRAM is available for graphics, and with many monitor sizes you can set a higher color depth in the Monitors control panel.

Next Slide Ready

TIP When you present a slide show on screen, Microsoft PowerPoint 3.0 prepares the next slide in the background to facilitate a fast, smooth transition from the current slide. However, your verbal transition is hard to coordinate with the slide because PowerPoint gives no indication when the next slide is ready. If you try to advance the slide too soon, nothing happens. As soon as the next slide is ready, PowerPoint displays it, but you have briefly lost control of the timing of your presentation.

Connectix PowerBook Utilities (CPU) to the rescue! The CPU indicators (battery condition, caps lock status, and so forth) tell you when the next slide is ready. They disappear from the upper-left corner of the screen while PowerPoint processes the next slide, and they reappear when the next slide is ready. For presentations, you can create a special CPU configuration set that shows only one indicator, and then switch back to your regular configuration when the presentation is over. For desktop Macs, Connectix Desktop Utilities (CDU) offers the same benefits. For more information on CPU or CDU, contact Connectix at 415/571-5100 or 800/950-5880.

Bernard L. Gutnick
Santa Clara, California

Hidden Monitor Options Holding down the option key while double-clicking a monitor depicted in the Monitors control panel brings up a dialog box from which you can select a gamma-correction method for that monitor. You can also access special options by option-clicking the Options button.

This tip requires CPU verson 2.03 or later. In addition, the master switch in CPU's Display panel must be turned on even if all options in the Display panel are turned off. In the Indicators panel, the Graphic Battery option must be turned on. Also, the PowerBook's AC adapter must be plugged in.—L.P.

Fonts Put Away Wrong

TIP You can disable a font by dragging it out of the Fonts folder (with System 7.1 and later), but you can't use the Finder's Put Away command to restore it easily. The Put Away command does put fonts dragged to the desktop back into the Fonts folder, but programs you open thereafter don't have access to the fonts you put away. To restore fonts so that subsequently opened applications can use them, you must drag the fonts to the Fonts folder or the System Folder icon (not the System Folder window).

Elios Azzone
Milan, Italy

Removing RAM Doubler Message

TIP My only complaint about Connectix's RAM Doubler is that at start-up it displays the message "Connectix RAM Doubler installed" under the "Welcome to Macintosh" message. You can replace that little phrase with one of your own, or with none at all. Begin by making a backup copy of the RAM Doubler extension, which you can do by option-dragging the original from the Extensions folder to the Startup Disk icon. Then use Apple's ResEdit utility to open the original RAM Doubler, and in the list of resource types that appears, double-click the DSAT type. Open the only DSAT resource, ID –4064, to see its contents. Then find the message on the

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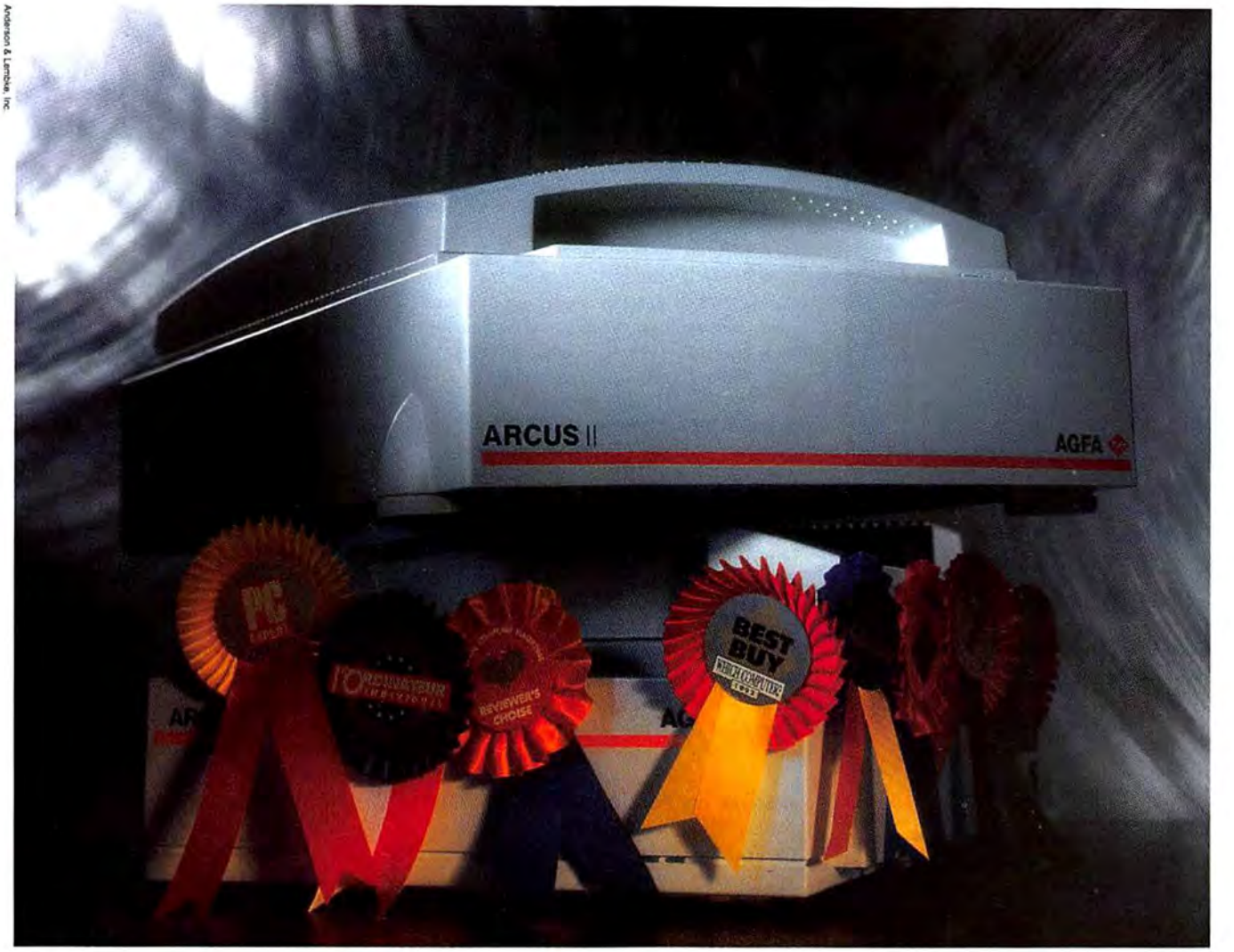

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right side of the resource-editing window, select it, and type a replacement (see "RAM Doubler Start-up"). Save your changes and restart the Mac to view your handiwork.

Sam Wong
Ames, Iowa

ResEdit is available from user groups, online services, and APDA (800/282-2732; 800/637-0029 in Canada; 716/871-6555 for other countries). It also comes with the book *ResEdit All-Night Diner* by Dave Ciskowski (1993, Hayden Books; 317/581-3500, 800/428-5331).—L.P.

E-Mail Interchange Update

You can exchange E-mail between various commercial online services through the Internet, but the table of sample addresses in September's *Quick Tips* contains a couple of errors. Howard Corneli of Salt Lake City says you should use an address of the form >INTERNET:cheetah@aol.com to send mail from CompuServe to America Online. Stanley Wong of San Francisco says jane@eworld.com is the correct type of address for sending E-mail to Newton Mail (which is part of eWorld).

Update on Forcing Order Invisibly

After pasting blank lines at the beginning of folder names to make the folders appear first alphabetically (as suggested by a tip in August's *Quick Tips*), Ken Pishna of Sheridan, Colorado, encountered problems printing in QuarkXPress and Aldus PageMaker. If he printed a document containing graphics that were placed in a folder whose name included a blank line (not a blank space), he got an "undefined PostScript" error. After he removed the blank line from the folder name, the same documents with no alterations printed flawlessly. If you encounter problems after pasting blank lines at the beginning of file or folder names, replace the blank lines with blank spaces.

Update on Word Tables in PageMaker

The method described in August's *Quick Tips* for getting a table from Microsoft Word into Aldus PageMaker (by using the LaserWriter 8 printer driver to save the table as an EPS graphic) is hardly the easiest method, says Elizabeth C. Klisiewicz of Westborough, Massachusetts. She uses Microsoft's OLE (Object Linking and Embedding) technology to embed the table in a PageMaker document as follows:

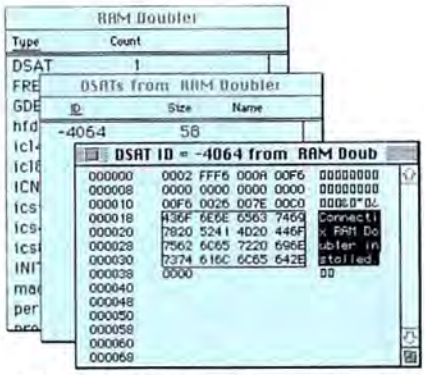
1. After creating your table in Word, select the entire table (or any part of it) and use the Copy command to put it on the Clipboard.

2. Switch to PageMaker and choose Insert Object from the Edit menu. The Insert Object dialog box lists all the types of OLE-compatible documents on your computer.

3. Select Word Document and click OK to bring up an OLE window in Word. Paste the table you copied in step 1 into this window. Close the OLE window and switch back to PageMaker, where you'll find the table already placed in your document.

4. You can manipulate the embedded table like any graphic in PageMaker. Double-clicking the table in PageMaker brings up the OLE window in Word. There you can edit the text and formatting of the table.

If you plan to use the table in more than one place, use OLE to link the original Word document with the PageMaker document instead of embedding a copy of the table. To link the original table, use PageMaker's Paste Link or Paste Special commands instead of Insert Object as documented in the PageMaker user manual. You can't use System 7's publish and subscribe feature instead of OLE, because the table ends up as unformatted text in PageMaker. When you upgrade to System 7.5, you may have to reinstall PageMaker 5.0 to make it work with OLE. OLE won't work with the native Power Mac version of PageMaker 5.0. **m**



RAM Doubler Start-up The message that RAM Doubler displays during start-up is stored in DSAT resource ID –4064, which you can modify with ResEdit as shown here.

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses.

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld System 7.5 Bible* (IDG Books Worldwide, 1994).

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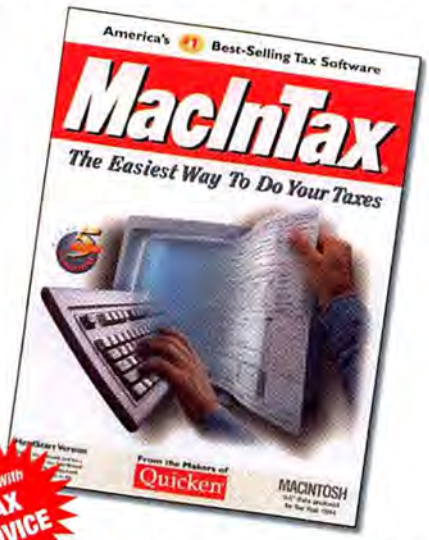

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Networks

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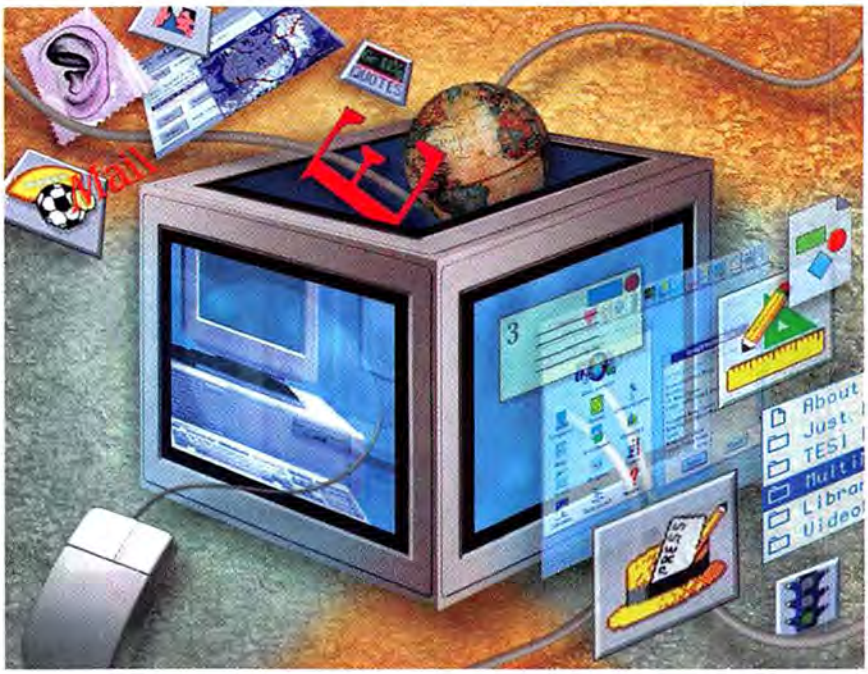
Microsoft Switches to Windows NT–Based Mail Server



DAVID KAHL

REDESIGNED AND RENAMED, THE successor to the Microsoft Mail server will offer many improvements—as long as you have a Windows NT–based computer to run it. Called Microsoft Exchange Server, the new software will merge mail-server and groupware-communications–server functions into a single product to provide a universal in-box for different types of messages, including E-mail, faxes, voice mail, and data from online services. The same in-box will handle forms, schedules, and other information exchanged by Microsoft, third-party commercial, or custom groupware applications. In fact, Microsoft Exchange Server will come with forms and scheduling applications.

The new client/server package, which won't ship until 1995, will let users format messages with rich text styles and embed OLE links, so you'll be able to drag an Excel chart into a message and edit it there, for example. Microsoft Exchange Server combined with Windows NT will let network administrators manage mail directories and monitor mail traffic and server status. (Windows NT is an operating system targeted at network applications, not to be confused with the ubiquitous Windows desktop system.)

Microsoft plans to continue to support—but not upgrade—the existing AppleTalk- and PC-server software for MS Mail. The company will keep upgrading the MS Mail client software for NetWare networks and for Macintosh, MS-DOS, Microsoft Windows, and Unix-based systems. Microsoft Exchange Server will require a PC running Windows NT Advanced Server (NTAS) version 3.5 (code-named Daytona), which was scheduled to ship in September. A pilot version of Windows NTAS Microsoft Exchange Server is due at the end of 1994, with a final release to follow once the pilot has been thoroughly field-tested and debugged. According to Microsoft, MS Mail Server customers will be able to upgrade to Microsoft Exchange Server without losing messages or applications based on MS Mail.

Customers who don't want to go the Windows NT route can consider forthcoming, unnamed migration tools from Apple—due in the first quarter of 1995—that will convert MS Mail messages and directories to a form compatible with PowerShare, Apple's communications server software. (PowerShare works with third-party mail clients and with the Apple PowerTalk clients that come with System 7 Pro and System 7.5.)

Customers who already have servers running Windows NT will probably not consider Microsoft's strategy an obstacle. Administrators of Mac-only E-mail systems are those most likely to switch E-mail brands, but they're not the only MS Mail customers who have taken advantage of CE Software's competitive upgrade to QuickMail.

MS Mail customer Rich Foster, who administers a NetWare network of 35 Macs and 200 PCs at TL Enterprises in Camarillo, California, said, "I'm very disappointed with the direction Microsoft is going." Already busy managing a varied electronic publishing shop, Foster doesn't like the idea of supporting yet another operating system (Windows NT), and he thinks Microsoft's move will limit rather than expand his options. Foster is trying QuickMail for now, while watching technology developments.

Apple Computer, 408/996-1010; CE Software, 515/221-1801; Microsoft Corporation, 206/882-8080.—NANCY E. DUNN

TCP/Connect II Improves E-mail

VERSION 2.0 OF TCP/CONNECT II, InterCon's net-surfin' software, sports a face-lift and a raft of mail and file-transfer improvements. This terminal-emulation software also now includes PPP, Gopher, and PowerMac support.

The E-mail component supports MIME and makes message handling easier. For example, the software can filter and sort incoming messages by multiple user-designated criteria, including sender and subject. Users can display MIME enclosures directly from an E-mail document—no separate downloading or decoding is necessary.

The revamped FTP software supports multiple connections. It lets users preview files before downloading them and automatically decodes several file types, including unstuffing a file if Aladdin's StuffIt engine is installed. TCP/Connect II costs $495. InterCon Systems, 703/709-5500.—CAMERON CROTTY

Blackbirds Make Analyzers Sing

THE BUILT-IN ETHERNET CAPABILITIES and 68040 processors of the 500-series PowerBooks make them an ideal choice for a network-protocol analyzer. The PowerBooks' design changes drastically increase performance over previous models, which were slowed by their external SCSI-to-Ethernet adapters. The AG Group reports that while a PowerBook 140 running the company's EtherPeek software captured all Ethernet frames at a 25 percent load, a 500-series PowerBook can handle an 82 percent load. In Neon Software's tests, a beta version of its NetMinder Ethernet software running on a 25MHz PowerBook 520 collected all packets at up to a 75 percent load.

Both Neon and the AG Group are updating their programs for the PowerBook 500 models. The AG Group offers a free EtherPeek upgrade via the Internet, CompuServe, AppleLink, or ARA. Neon's NetMinder Ethernet version 3.2 is available via eWorld, AppleLink, ARA, and the Internet. The AG Group, 510/937-7900; Neon Software, 510/283-9771.—JOEL SNYDER

ROBERT PERRY

The PowerBook 540c offers roving network managers a fast, lightweight platform for protocol analyzers like The AG Group's EtherPeek.

Sonic Systems Supports SNMP

SONIC SYSTEMS' FALL ETHERNET lineup features a stackable 16-port hub and a switch that support SNMP.

With the IntelliStack 16 hub, a customer can combine a base hub with up to five expansion hubs to create a single logical hub with 80 ports. Network administrators can use the IntelliStack's SNMP software to manage the hub and other SNMP-manageable network devices from a Macintosh, or use another vendor's SNMP-management system to manage the hub. The IntelliStack 16 ships with 10BaseT support; 10Base2 and FDDI are optional. The base hub carries a modest price of $80 per port; the expansion hub's per-port price is $60.

The EtherSwitch ($2499), an Ethernet switch, has five 10BaseT ports that can support a maximum network throughput of 20 Mbps over two simultaneous 10-Mbps connections. Both the switch and the hub are expected to ship in September. Sonic Systems, 408/736-1900.—MARTHA STRIZICH

Lotus Mail Moves Closer to Notes

LOTUS DEVELOPMENT RECENTLY acquired SoftSwitch, a company that made its name with products that make it possible for everyone in a large enterprise network to exchange electronic mail, despite dissimilar mail systems. Lotus eventually plans to incorporate SoftSwitch technology in its LAN-based products. But initially, Lotus's new messaging server software, called Lotus Communication Server (LCS), won't include SoftSwitch elements.

Due in 1995, LCS—essentially a combined Notes server and cc:Mail post office—will bring Lotus Notes and cc:Mail closer together. Both products will use LCS as their messaging server, and Notes will incorporate cc:Mail to handle E-mail exchange. A new cc:Mail Client/Server Edition will make it easy to add cc:Mail for users who don't need Notes. LCS will support cc:Mail post offices that will work with versions of the familiar file-sharing clients enhanced to include the LCS message transport. In addition, LCS will support native X.400 and SMTP/MIME transports and native X.500 directories. LCS will be available in Unix, Windows NT, OS/2, DOS, and NetWare Loadable Module versions.

The forthcoming LCS Mac client, due in the first quarter of 1995, will include the ability to filter incoming mail and search for messages with Boolean operators. Prices for LCS and the new clients were not set at press time. Lotus Development Corporation, 800/448-2500.—MARTHA STRIZICH

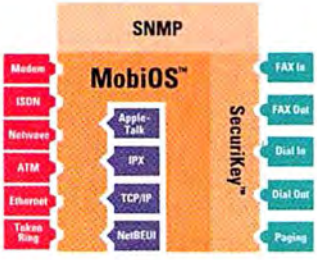
IN BRIEF

■ **ARA Users Get TCP/IP** A TCP/IP software gateway from Apple Computer allows Apple Remote Access (ARA) and LocalTalk users to access a TCP/IP network. Previously, ARA clients could not take advantage of TCP/IP services such as Internet access. The Apple IP Gateway ($249), which translates between AppleTalk and TCP/IP, is scheduled to ship September 15. Owners of ARA MultiPort Server 2.01, ARA Personal Server 2.01, and Apple Internet Router 3.01 can purchase the gateway for $69. The client must have MacTCP. 408/862-3385.

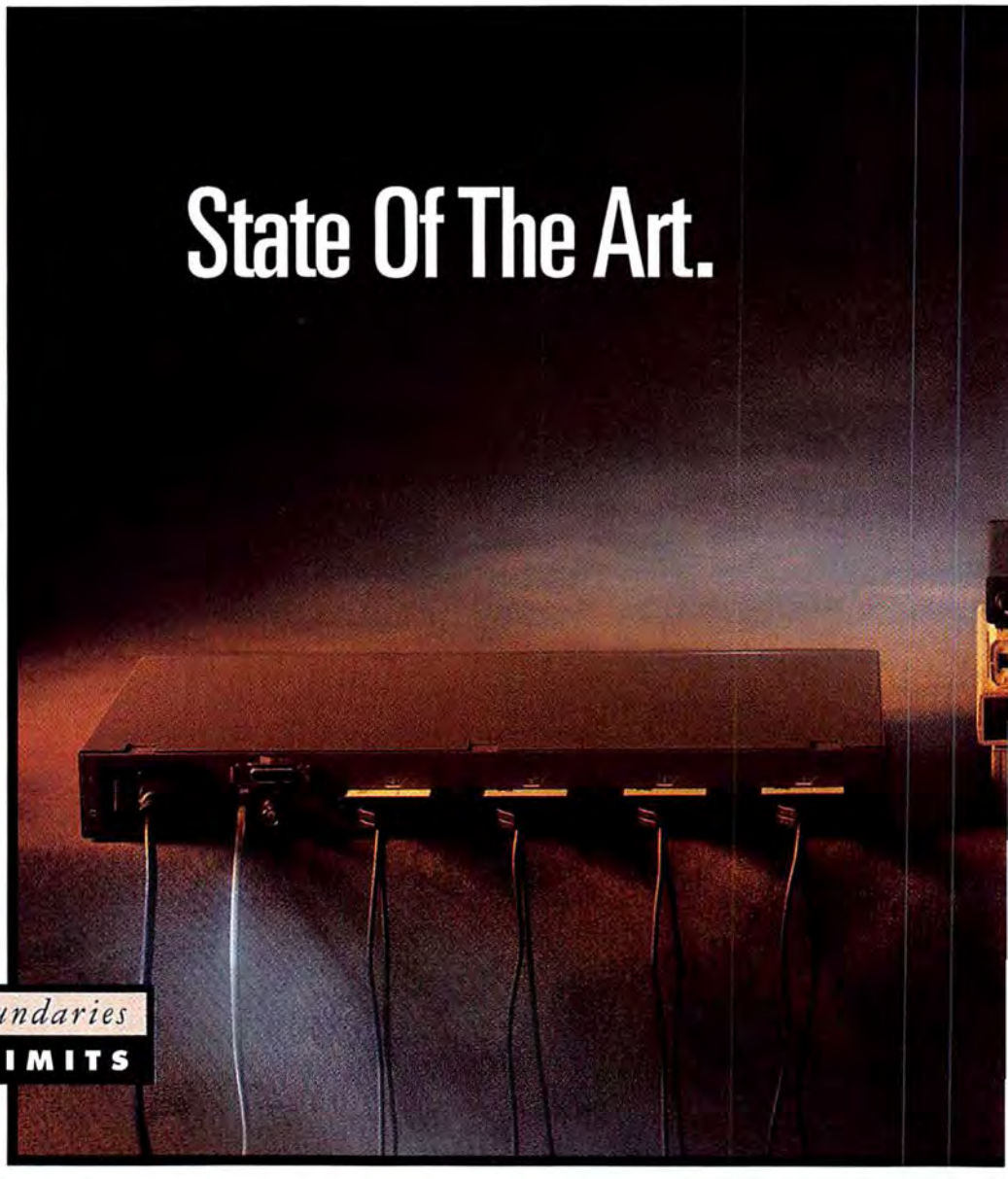
■ **Faster File Transfer** RUN's RunShare system extension accelerates Ethernet file transfers fourfold, according to the company, through proprietary technology. This version, due in August, supports drag-and-drop copying. RunShare costs $399 for 2 users, $749 for 5 users, and $2499 for 25 users. A LocalTalk-only edition is $199 for 6 users. 408/353-8423.

Software Wave PowerPC-compatible FileWave 2.0 from Wave Research automates software distribution over a network. It costs $895 for a server and 20 workstations. 510/704-3900.

After This, You'll Think Of Remote Access Servers In One Of Two Ways.



DaynaLINK for ARA is a mobile networking platform built on Dayna's multi-tasking MobiOS operating system, allowing all industry protocols and services to be added with PCMCIA-based software modules. Each module can be independently managed via SNMP, and SecuriKey security software lets you control access to available services.



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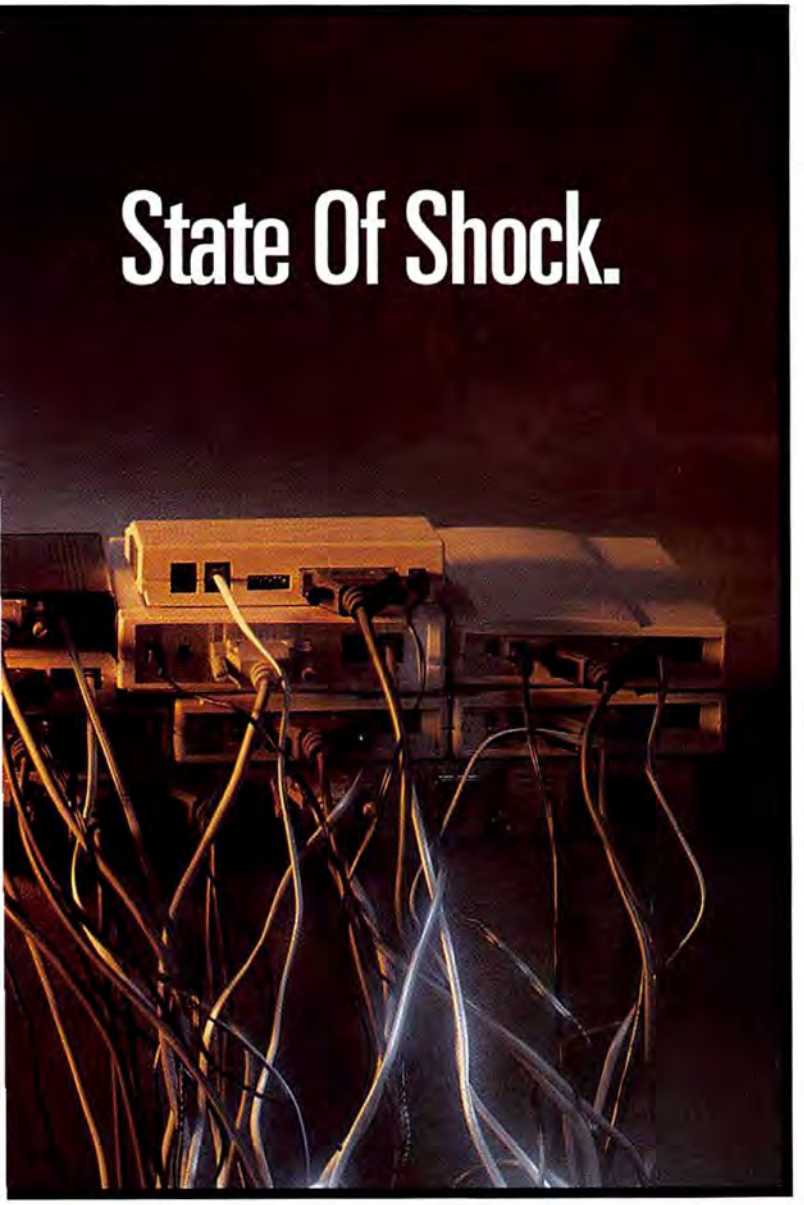

But if you think simplifying dial-in remote access is all there is to DaynaLINK for ARA, you're in for a bigger surprise. This patented technological breakthrough utilizes the multi-tasking MobiOS™ operating system, which will soon let you add such protocols as TCP/IP, IPX and NetBEUI, as well as services like dial out, fax in, fax out, paging, and both local and wide area wireless access. All as easily as popping in a PCMCIA card.

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For a free guide to Mobile Access Communications, call 800-443-2962, ext.552

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These programs make it possible to track down illegal software on your network

Piracy Prevention

by Kristi Coale

SOFTWARE PIRACY OFTEN RESULTS FROM BENIGN INTENTIONS. A graphic designer suddenly needs an application to complete a small project. The designer asks a coworker for the program, copies it, and finishes the report. Task completed, this user may not give another thought to the illegally copied application, which sits on the hard drive in perpetuity.

Multiply this experience by tens or hundreds of employees, and a network manager can face a real chore in sorting out and enforcing software licenses. In large corporations, policing the ebb and flow of software throughout the organization can be a full-time job by itself.

And this job is important because piracy can have serious repercussions. Companies risk stiff fines for illicit software, according to the Software Publishers Association, a worldwide trade organization.

Putting a company on the path toward legal software use can be daunting without a software-tracking system. Three dedicated products tackle the job: Quota from Proteus Technology, KeyAudit and KeyServer from Sassafras Software, and the Software Publishers Association's SPAudit. (On-site auditing services are also available, from InfoLink.) Once a solid auditing system is in place, the other components—writing up a company policy, educating employees, and setting up a license-monitoring system—are not so tough to assemble.

Taking Stock

Piracy proliferates mainly because of poor network management and a failure to understand what makes a piece of software illegal. For instance, a system administrator may buy new software for a new user, but may not follow up later with updates for established users. Some users will then update their software by copying the new employee's version. All of these "updated" copies could be illegal.

Because episodes like this happen frequently, a manager should take an initial inventory of software. This means the manager will have to create a list of all software on every Mac in the company. Fortunately, help is available in the form of asset-management software (see "Legal Eagles: Asset Managers Compared").

An asset-management program looks up the software on individual Macs and generates a database of the applications it finds, along with version numbers and creator codes—useful for identifying an application when a user has changed its name. Asset-management programs can also help a manager standardize and update the versions of each program.

Some programs, such as SPA's SP-Audit and TechWorks' GraceLAN Asset Manager, require you to go from Mac to Mac to build the database. Others, like Sassafras Software's KeyAudit, use System 7's file-sharing conventions and run off a server where all users have read and write privileges. Users log on to the server to conduct their own audits, and the information is collected on the server. Some users prefer this method, as a manager is not "invading" their machines to conduct the audit. However, this can be an extra hassle for the network manager who may need to do some follow-up to ensure that all users conduct an audit.

Programs like GraceLAN Server Manager ($395) from TechWorks (512/794-8533), netOctopus ($645 for 10 to 20 users) from Helios USA (408/864-0690), StatusMac ($29.95 per user for 25 to 75 users) from On Technology (617/876-0900), and Radar ($499 for one administrator and unlimited clients) from Sonic Systems (408/736-1900) are primarily network-management packages, but all can audit Macs along a network. The administrator on the server polls network clients and takes an accounting of the software on each machine. By the time you read this, Symantec should be shipping Norton Administrator for Networks, which includes audit and license-management functions but operates from a Windows administrator.

Armed with the results of the inventory, a manager is ready to perform an audit of the network's software. To do this, the manager needs the purchasing records and licensing agreements for all the software, which will then be reconciled with the inventory. If the purchasing and licensing records indicate, for instance, that a company is licensed for 10 copies of Microsoft Word but the inventory shows that 15 copies exist, then 5 of these are probably illegal.

If you detect illegal software, destroy it and then replace it with a legal copy. Remember to register the new software in the database—periodic maintenance will keep the database current.

If you don't have the time to do all of this yourself, some network systems integrators offer this service. In addition, InfoLink's Software Audit and Hardware Audit Service can do it for you. InfoLink will come out to a firm and use proprietary software to generate the inventory database, as well as a license database culled from purchase orders, manuals, and other proof of software license ownership. The company then generates a software-compliance report and offers advice on how to get the most out of software licenses.

Learning about Licenses

The results of an audit can serve as the impetus for changing the way you buy software. The larger your company, the more flexibility and leverage you have in the types of licenses you can negotiate.

The most common licenses are those given to an individual or to a computer. The former allows a single user to run the application, and the application stays with that user no matter which computer the person uses. Software licensed to a single machine means that the application can be used only on that machine. Multiple users, however, may log on to that computer to use the application. This licensing scheme is common among companies with fewer than 75 computers, because many software companies don't negotiate discounts for small firms.

Site licenses grant the use of a product to a large number of people, but they are expensive. This is why site licensing is on the decline and so-called enterprise licensing is taking its place. An enterprise license is sold to a group of users at a discount. The number of users can be increased to a preset level; when growth reaches beyond that level you negotiate a new license. The net result: a manager has only one license to maintain for the application.

Managers should exercise caution when negotiating this type of license, however, particularly for a server-based product. When you renegotiate a license, the new price usually covers new users but not another server component. The new cost per user may actually exceed the cost per user in the original agreement. So it can be less expensive to simply purchase additional packages and have several licenses for an application rather than a single companywide license.

Another recent twist in licensing, concurrent use, is gaining popularity thanks to the wider use of networks in corporations. This setup saves an organization a lot of money because it needs to buy only as many copies of a program as are in use simultaneously at peak times.

Keeping Software Legal

A company may have several types of licenses, but it should have one way of enforcing them. License-management programs come with a main application that resides on either a server or a manager's workstation, and with client software to let a manager monitor software usage and check on version numbers and legality. For this system to work properly, though, the license-management program must install license control in applications. Applications that do network

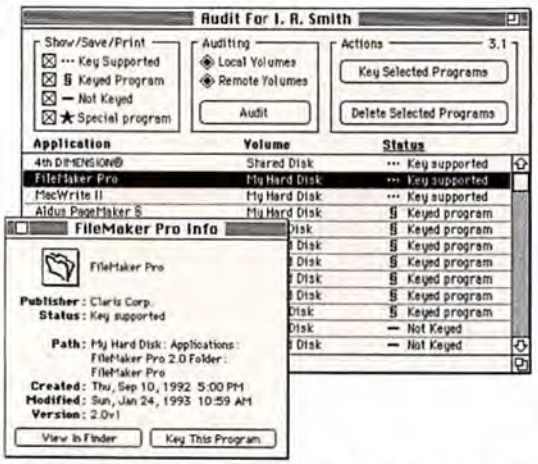
Legal Eagles: Asset Managers Compared

Company	Product	Phone	Toll-Free Phone	Price */ Macs Served	Software Audit	License Management	Software-Use Log	Software Checkout
InfoLink	Software Audit and Hardware Audit Service	303/773-0987	800/592-8348	$875/25	●	○	○	○
Proteus Technology	Quota 3.0	403/448-1970	NA	$495/10–20	○	●	●	●
Sassafras Software	KeyAudit 3.1.9 **	603/643-3351	NA	freeware	●	○	○	○
	KeyServer 3.2	605/643-3351	NA	$680/10–20	○	●	●	●
Software Publishers Association	SPAudit 1.0	202/452-1600	800/388-7478	freeware	●	○	○	○
TechWorks	GraceLAN Asset Manager 2.0	512/794-8533	800/846-9741	$995/1	●	○	○	○

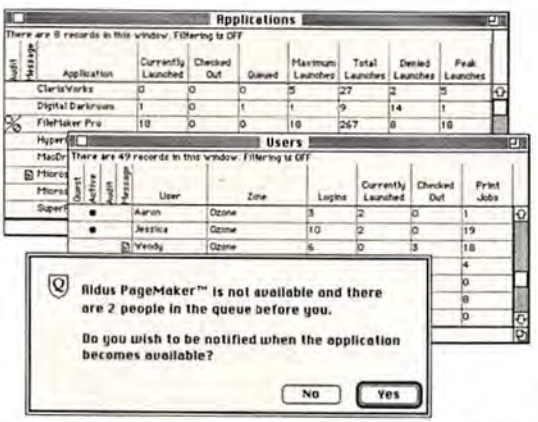
● = yes; ○ = no; NA = not available. * Some larger-volume discounts are available. ** When used with KeyServer, can distinguish between KeyServer-controlled and personal applications and can convert the latter to KeyServer applications. Also available through AppleLink and CompuServe.

copy detection need to be compliant with the license-management software.

Two programs are dedicated to all the license-management functions outlined above: Sassafras Software's KeyServer and Proteus Technology's Quota. In each, an administrator sets the number of licenses available for an application and activates the program on either a dedicated server or a manager's Mac. Users launch applications on their Macs as usual. With Quota, the client polls a license server to see if a license for a specific piece of software is available. With KeyServer, a client (an INIT called KeyAccess) initiates contact with the KeyServer machine.



KeyServer Audits KeyServer can audit a network, dividing applications into three categories. Access to a Keyed Program goes through KeyServer, while Not Keyed refers to applications that are not administered through KeyServer. Programs that are Key Supported, such as the FileMaker Pro example, are stray copies of an application supported by KeyServer but without access controls set through KeyServer.



Real-Time Application Tracking Quota tracks application use by program or user (top two screens), and it can alert users when all licensed copies of an application are in use (bottom) and when a copy becomes available.

In each program, the client software notifies the user if no license is available, places the user on a notification list, and then sends a message when the application becomes free.

To a lesser extent, TechWorks' GraceLAN Server Manager also governs concurrent use. You can select the copy-protection option and then input the number of licenses available for a given product. For example, if there are five copies of Aldus PageMaker, the server then allows only five users to launch it at one time. But Server Manager won't notify the sixth user when all available copies are in use, nor will it send notification when a program becomes free.

In KeyServer and Quota, license restriction extends to a mobile workforce, as users can "check out" applications to use on PowerBooks or on their Macs at home like people check out books from a library. For every application that is out, the number of licenses available for it on the network is reduced by one. Loaned applications are active only for a specific period of time, after which they cannot be launched.

When an application is under the watch of a license-management program, the license manager recognizes only the monitored copy for checkout. KeyServer also attaches a key to this monitored application. Without the key, the application will not launch.

These asset-management programs also generate usage reports—an accounting of such things as peak use, the number of users of a program for a given period, and the number of users waiting to use each program. With this information, an administrator can demonstrate the need to purchase more software.

The Last Word

License management carries a dual responsibility for any network manager. On the one hand, it is a manager's job to ensure that all of an organization's software is legal. But the manager should also consider the privacy concerns of users, who may perceive management attention to the contents of their hard disks as invasive. Managers should try to allay these fears before conducting an audit, and even perform the audit in the presence of the user. At the same time, a manager needs to explain what constitutes piracy and lay down the company policy governing software use. The SPA offers free sample policies as well as educational videos to help in developing such policies.

A manager can explain how the license manager and audit system work. When the network manager lets users in on the process and perhaps uses a server-based asset-management package like KeyAudit, users will be less hostile to the new system because they can exercise some control over it.

Adjusting to a license-management system is not likely to be a problem for most network managers. You'll work comfortably knowing that the company's software is perfectly legal and that there is one less task that requires you to be in all places at all times. **m**

Freelance writer KRISTI COALE has covered network-management issues for three years.

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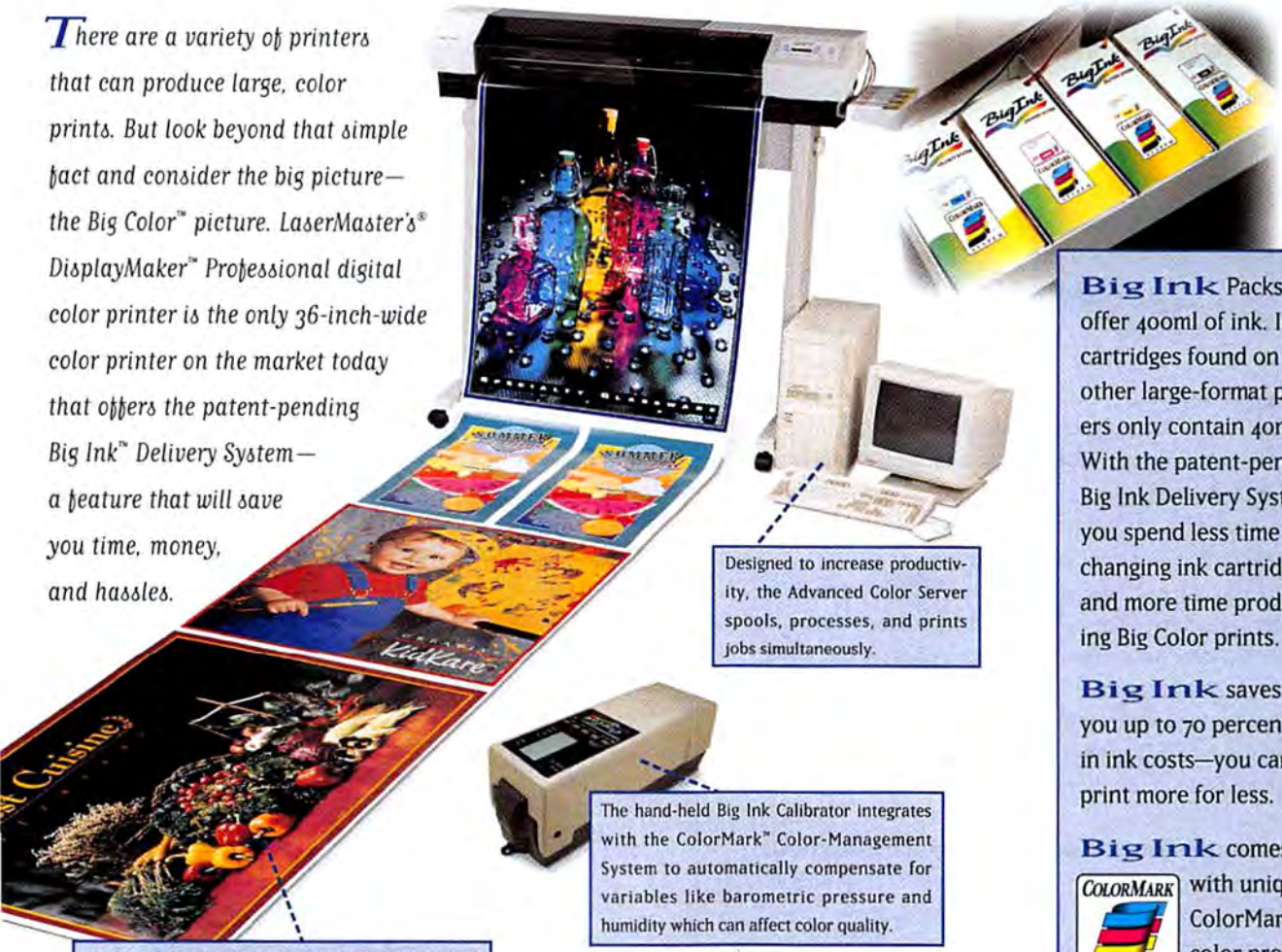

Designed to increase productivity, the Advanced Color Server spools, processes, and prints jobs simultaneously.

The hand-held Big Ink Calibrator integrates with the ColorMark™ Color-Management System to automatically compensate for variables like barometric pressure and humidity which can affect color quality.

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Circle 103 on reader service card

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Circle 58 on reader service card

BY CARY LU

PowerBook Notes

Ethernet for PowerBooks

ONE OF THE BEST FEATURES OF THE PowerBooks is their ability to fit into a Macintosh network with their desktop cousins. Every PowerBook has LocalTalk networking built in; it's effective but rather slow—essentially, floppy disk speed. Ethernet runs three to ten times as fast, at hard disk speeds.

Direct Connections

There are many ways to connect a PowerBook directly to an Ethernet network. I give approximate street prices for generic devices with 10BaseT connectors or thin coax. Many of the devices are also available with both connectors for an additional $30 to $60. I give list prices for specific products.

The best and fastest way to connect to Ethernet is via a full-speed port:

- An Ethernet transceiver that runs through the AAUI Ethernet port costs about $60. The AAUI port is built into 500-series PowerBooks and the Duo Dock II (and most current desktop Macs). Some older AAUI transceiver plugs will not fit into a 500-series PowerBook; contact the maker for replacement cables.
- Ethernet docks for the Duos come in two flavors with 10BaseT connections. Newer Technology (316/685-4904, 800/678-3726) makes a very small Ethernet MicroDock ($249) with a 10BaseT connector and an ADB port; Asanté Technologies (408/435-8388, 800/662-9686) sells the same unit as the NetDock ($259). The larger EtherDock ($699) from E-Machines/SuperMac (408/541-6100, 800/334-3005) has all standard ports (except for the modem). The EtherDock needs a hardware update for compatibility with the Duo 280/280c.
- A NuBus Ethernet card (for the original full-size Duo Dock) costs $100.

PHOTOGRAPH BY PAUL FRANZ-MOORE/SCREEN IMAGE BY JIM LUDTKE

For a 100-series PowerBook or a Duo with other docks, adapters use the SCSI or serial port. Speeds run one-third to one-half as fast as the full-speed Ethernet port (see "Network Speed Tests").

- Small, portable SCSI Ethernet adapters ($270 to $300) draw power from the ADB port. ADB powering does work, although these adapters push the limits of the power available. (Some of the more conservative designs use an AC adapter instead.) The adapters differ mainly in how they handle SCSI cabling. The Asanté Micro EN/SC plugs directly into the PowerBook's SCSI connector to save space, but you can't attach any additional SCSI devices. The DaynaPort Pocket SCSI/Link (reviewed in this issue) requires a short cable and can accept more SCSI devices. These small SCSI adapters make sense if you need to connect to more than one network on your travels.
- Larger SCSI Ethernet adapters use AC power and go for about $220. Besides the larger box, these adapters have an AC power brick. If, like most people, you connect to Ethernet in only one location, you can leave the adapter and power supply in place. The larger SCSI adapters may need a cable adapter for the HDI-30 connector on the PowerBooks.
- Serial port–to-Ethernet adapters—such as The EtherWave PowerBook Adapter from Farallon Computing ($379; 510/814-5000) and the $309 DaynaPort E/Z from Dayna Communications (801/269-7200, 800/531-0600)—provide a solution for Duos without docks. These adapters have a built-in clock that runs the serial port at half to two-thirds the speed of a SCSI Ethernet adapter; they do need their own AC adapter for power. Serial port–to-Ethernet adapters can also work on 100-series PowerBooks, but less expensive SCSI adapters leave the serial port free for other uses.

Indirect Connections

All the methods described so far connect a PowerBook directly to Ethernet. A PowerBook using LocalTalk can also connect indirectly to Ethernet through some intermediary device. Direct connection is always faster, but the indirect methods can be cheaper. Some LocalTalk devices—particularly printers—cannot be put directly on Ethernet.

- A hardware router connects Ethernet and LocalTalk devices together with as many nodes as the networks can support. If you have more than a handful of LocalTalk nodes to connect to Ethernet, a router is essential. Prices begin at $700.
- LocalTalk-to-Ethernet bridges work like routers for two to four Local-

continues

Talk nodes; $300 to $450.

• Software bridges use a Mac to connect Ethernet and LocalTalk networks. Farallon's PowerPath and PowerBridge from Sonic Systems (408/736-1900, 800/535-0725), both $149, can support just one PowerBook; others support up to ten nodes for about $250. A software bridge runs at the same speed as a pure LocalTalk network. Software bridges make sense for occasional use. Hardware routers or bridges work better for heavy use; for one thing, they won't crash.

Wiring Variations

Since wiring installation is often a network's largest expenditure, some Ethernet hardware offers variations on the usual 10BaseT or thin-coax cabling to simplify the wiring. If you can lay down standard Ethernet cable cheaply, such variations are less attractive.

• If you have PhoneNet LocalTalk cabling in place, you must replace it all for Ethernet unless you use Tut Systems' Silver Streak Ethernet hardware (510/682-6510, 800/998-4888), which uses plain phone cable (all four wires), including existing PhoneNet cabling. To combine Silver Streak with 10BaseT, you'll need a $199 adapter from Tut.

• Farallon's EtherWave devices work like ordinary 10BaseT hardware except that you can daisy-chain them together using 10BaseT wiring without using a 10BaseT hub. But their priciness (an additional $50 to $100 per node) cancels out their utility value, since the additional money you'd spend on four EtherWave devices would pay for an eight-port hub.

• A minihub combines a five-port 10BaseT hub with an AAUI transceiver. Apple's $149 10T/5 Workgroup Hub can draw power from the AAUI port or from an optional AC adapter to keep it operational even if the PowerBook is shut down. Asanté's $239 NetExtender Hub gets AAUI power only from the AAUI port. These hubs count as one hop (a single Ethernet network can have four hops).

Servers and Software

When you plug into a network, you are usually connecting to a network server, a desktop Mac that supplies files and storage to any computer on the network, including PowerBooks. With System 7's file sharing, the server can run other Macintosh programs at the same time—with some restrictions. You have to pay attention to (and sometimes wait for) changes in file-sharing settings when you switch storage devices, including removable cartridges and CD-ROMs. Any disruption to the server will also affect any computer using the server. PowerBooks usually don't make good file servers because they are frequently turned off and in transit.

For heavy network traffic, a dedicated Macintosh server running Apple's full AppleShare software will outperform System 7's simpler file-sharing.

The server doesn't even have to be a Macintosh; Personal MacLAN Connect ($199 from Miramar Systems, 805/966-2432, 800/862-2526) turns an IBM PC or compatible on the network into an AppleTalk file server that can run Windows software at the same time; through MacLAN, a PowerBook can print to DOS printers. Personal MacLAN Connect supports many Ethernet and LocalTalk cards for the IBM PC.

For many situations, Farallon's Timbuktu Pro is simpler than file sharing from a server because it can send files from one Mac to another without going through a server or fussing with file-sharing settings. And Timbuktu lets one Mac see and control a second Mac (or a Windows PC; see *PowerBook Notes*, December 1993). But Timbuktu costs from $199 for one Mac to $999 for ten Macs.

Network Software Questions

Since Ethernet hardware is pretty much standardized, you can mix products from many vendors. Install whatever software comes with the device and then update with Apple's latest network software (as this is written, version 1.4.5).

The Apple system software installer will probably put the A/ROSE extension in your System Folder if you specify Ethernet during installation. You need A/ROSE only if you run an SNA gateway to large mainframe computers on an Apple-brand NuBus TokenTalk card. For all other network connections, you can toss out A/ROSE.

When you change between LocalTalk and Ethernet, be sure to switch network types in the Network control panel.

The Personal Ethernet Network

Most PowerBook owners also have a desktop Macintosh; you can create a simple network by connecting the two. In my office, I use a PowerBook exclusively for telecommunications, E-mail, lengthy file uploads and downloads, and faxing while I work on the desktop Mac. Other tasks for a second computer include compiling programs, rendering graphics, running business simulations, and printing complex jobs that may not run in the background. Once you've gotten used to having two computers running simultaneously, you'll never go back to a single computer again. ■

Network Speed Tests (In seconds; smaller numbers are better.)

	Timbuktu Pro	System 7 File Sharing
Via Ethernet		
second Mac IIfx	16	26
PowerBook 540c	23	19
Dayna SCSI/Link SCSI Ethernet adapter		
PowerBook 180	51	50
Farallon EtherWave serial-port adapter		
PowerBook 180	73	102
Duo 210	68	74
DaynaPort E/Z serial-port adapter		
PowerBook 180	93	105
Duo 210	98	99
Via LocalTalk		
PowerBook 540c	137	242
PowerBook 180	167	268
Duo 210	170	232
Via Dayna PathFinder Ethernet-to-LocalTalk router		
Duo 210	150	179
Via Sonic PowerBridge software bridge running on a Mac IIfx		
Duo 210	171	218

Time to transfer a 2.5MB folder using a Mac IIfx as the file sender and file server, with no other network traffic.

CARY LU is a *Macworld* contributing editor who covers mobile- and remote-computing issues in this monthly column.

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Previous Home Address, Number And Street		City Or Town		State	Zip Code	Years There	

Please Tell Us About Your Job

3

Business Name Or Employer		Position	Years At Job	Business Phone Number And Area Code ( )
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☐ Savings Account	Bank/Institution Name:
☐ Visa/MasterCard ☐ Dept. Store/Sears	☐ Diners Club ☐ Gasoline ☐ American Express ☐ Other

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Date

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CB-00838 (3/94)

THE DESKTOP CRITIC

BY DAVID POGUE

Money in Your Pocket

The Newton gets down to business

LONG AFTER THE MEDIA'S HECKling of the original 1993 Newton died away, a funny thing happened to Apple's hand-held pygmy computer: it got useful. The transformation took place slowly and silently, a result of software updates, mechanical improvements (such as the MessagePad 110), and neat new programs from non-Apple companies. This handwriting-recognizing, Mac-descended palmtop is finally approaching worthwhilehood.

So why cover Newton software in a Macintosh magazine? Because Newton software holds a lesson for Mac software developers. Newton programs, as enforced by the machine's teeny screen and tiny memory, are simple and efficient. There are no submenus, no nested folders, not even icons for your documents. You rarely need a manual for a Newton program. (When I was your age, we used to say that about the *Mac*.) As you'll read here, a Newton program's motto is "Do one thing very well" . . . usually.

iambic TimeReporter 1.1

Each Newton program seems designed to eliminate a different category of paper scraps in your pocket. The Newton's built-in Note Pad, of course, replaces cocktail napkins and pocket penny pads.

iambic TimeReporter, on the other hand, is a Newtonized time slip ($129; iambic software, 408/746-3709). It can grab the names of your clients, or the dates of your appointments with them, from your Newton Names or Dates files, saving you handwriting. It can chat in the other direction, too: you can enter an appointment into TimeReporter (for billing purposes) and have it show up on your Dates screen. The stopwatch keeps track of your time even when the Newton is off—neat trick—or you can enter your working stints manually; a little Expense slip lets you bill your client for the occasional cab or pizza.

When it's all over, the program can display, print, and fax tidy summaries organized by client, project, or whatever. My only befuddlement: why can't you write in your hourly rate, so you can also see how much you earned (and print an invoice)? iambic's only answers: (a) we'll have that in version 2, and (b) lawyers let their secretaries do that stuff anyway.

ExpensePlus 1.0.1

Four aspects of the smooth, smart, solid ExpensePlus make using it better than recording trip expenses on paper ($139.95; State of the Art, 714/753-1222). First, ExpensePlus does the math for you, even converting foreign currency. Second, it looks clean and inviting on your little Newton screen; the 12 neat icons give you direct access to expense slips for things like Parking, Supplies, Tips, and Fares. Third, the program's brains save you effort: if you want to record a meal,

for example, ExpensePlus automatically proposes breakfast, lunch, or dinner, depending on the time of day. Furthermore, you can scratch in, say, "$7.50 cab" in your Note Pad, and the Newton's Assist button automatically creates an appropriate expense slip. And fourth, ExpensePlus comes with Macintosh templates for Microsoft Excel and Claris's FileMaker. When you get back from your trip, connect the Newton to your Mac using a printer cable, transfer the data collected during your trip, and print out the beautifully formatted expense reports.

Still, ExpensePlus has a couple of SmallMinuses. It wolfs down 238K of memory; for this one-trick pony, that's a 12-course dinner. The serial number required before your first use is stupidly printed on the registration postcard, which, if you're a good little camper, you've already mailed away. A question, too: what are you supposed to do with the actual receipts that ExpensePlus so nicely summarizes? Despite your high-tech investment, you wind up with little scraps of paper in your pockets after all.

MobileCalc 1.03

Of all the computers on earth, the Newton, with its 3-inch-wide screen, would seem the worst choice for a spreadsheet. MobileCalc, for example, starts up showing only three columns ($119; MobileSoft Corporation, 408/376-0497). True, it has every conceivable feature for alleviating the real-estate problem—scrolling controls, a zoom-out button, first-row/column locking—but you still feel like you're laying out the *National Enquirer* on a Mac Plus screen.

Believe it or not, that's not even MobileCalc's biggest problem, which is speed—MobileCalc doesn't have any. Not that the Newton is a Cray or anything, but this program is *really* slow on my original Newton: it takes three to five seconds for *anything* to happen.

There are 70 math functions; you can create formulas; and little on-screen palettes simplify entering numbers and words. But you can't change the size or style of numbers or text, and 367K is too much to cede to such lethargy.

QuickFigure 2.0.1

If MobileCalc's not quite your speed, there is, fortunately, another contender for the title Excel of the Newton world: QuickFigure ($39; PelicanWare, 503/221-

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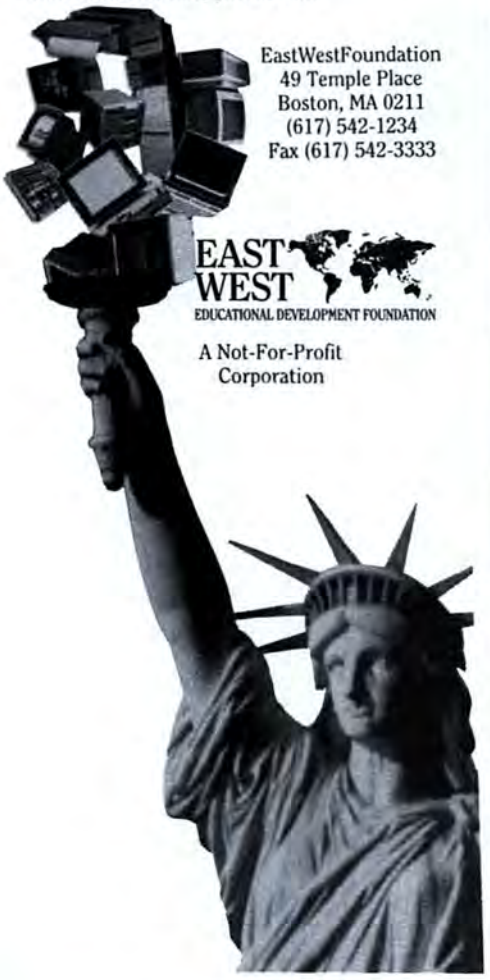

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1148). For a Newton program, this spreadsheet is fast, cheap, and slim (a paltry 125K; 30K more for graphing). QuickFigure neatly ducks the cell-size issue by making you enter numbers in a little input bar, just as Excel does (instead of letting you write directly into a cell, à la MobileCalc). The benefit, of course, is that you can see 5 columns and 17 rows in QuickFigure's start-up setup.

If you had to name the bare essentials for a useful spreadsheet, you'd probably arrive at this program: formattable text and numbers; copy, paste, fill; 85 math functions plus IF-THEN statements; a rudimentary graphing program (installed separately); and an online 88-screen manual (also separate). QuickFigure also niftily integrates with the rest of the computer: you can scrawl "Figure 23*434/23" in the Note Pad, for example, and tap Assist for the answer. You can also send chunks of your spreadsheet (but not graphs, alas) to the Note Pad for incorporation into your memos. The import/export to Excel is clumsy, but I'll take QuickFigure over the back of an envelope any day.

Gulliver's Expenses Tell Gulliver what city you're in, and it resets your Newton's clock, area code, and NewtonMail phone number. Gulliver also tracks your expenses (background).

Accountable 1.03

Accountable ($39; Nomadic Technologies, 216/331-5771) is an ingenious idea. It's a checkbook balancer that's vaguely—*vaguely*—reminiscent of Intuit's Quicken on the Mac. As you scurry through your daily routine, paying bills, visiting cash machines, and so on, you can use Accountable to mind your checks and balances. Unlike Quicken, however, Accountable doesn't print checks, do graphs, offer a funds-transfer option, or make reports.

Ever hear the epithet "un-Mac-like" applied to a Macintosh program in which scroll bars and menus have been replaced by the programmers' own crude creations? Ladies and gentlemen, I give you: the first un-*Newton*-like software. Accountable substitutes dots for diamonds (to represent pop-up menus) and goofy-looking triangles for the standard Newton up and down buttons (for scrolling lists).

I would have been utterly dismissive of this software effort until I learned that version 2.0, supposedly ready as you read this, addresses virtually every whine of mine so far. It also adds reports, graphs, a Mac front end, and exportability to the personal-accounting software god itself, Quicken. If that's all true, I won't mind holding Accountable.

PocketMoney 1.0.2

Until Accountable 2.0 crawls out of its cocoon, I'll be using this very similar—but better designed—shareware program ($20; Hardy Macia, 1413 Surrey Ln., Wynnewood, PA 19096, or in the Mac-world area of America Online). It has two crystal-clear screens: one that shows a register, like a checkbook, and another where you write in each transaction. Like a good little Newton program, its customizable pop-up lists save you handwriting. Incredibly, the Read Me file says that even this little shareware creature can export to Quicken, although I couldn't find any instructions.

TapWorks

My jaw dropped clear to the coffee table when I read about this one. In a single *Newton* program, you supposedly get a miniature ClarisWorks: four integrated applications that can dress up a full letter-size page ($119; Avail Technology, 408/730-6855).

Well, sort of. The four "applications" turn out to make text boxes, spreadsheets, graphs, and drawings. The mini-MacDraw is by far TapWorks' strongest feature: you can draw shapes, apply your choice of fill and line styles, and even align them (sadly, drawings are the only data you *can't* export to the Note Pad). The spreadsheet is so slow it's practically unusable; even if you write a word quickly into the cell-input box, TapWorks can't see it as a word, and instead interprets a letter or two at a time.

On one hand, the program has a million beautiful ideas, such as the Connect command that (at last!) lets you type on your Mac keyboard to enter text into the Newton. On the other hand, it has a million shortcomings: tapping a graphic object doesn't select it (you have to circle it); you can't use your spreadsheet data to

continues

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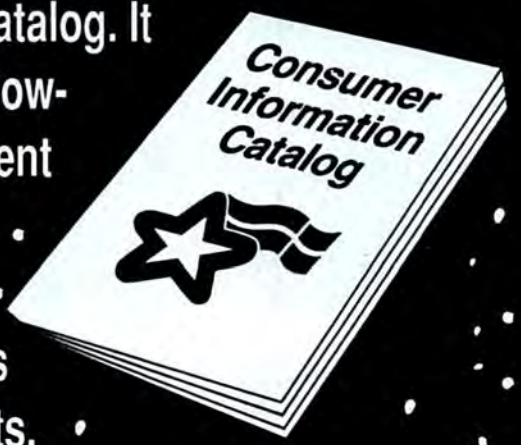

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create graphs; and the whole thing creaks along like a swamped rowboat. On the *other* other hand, maybe I'm like the guy who says the bear dances badly; I should just be grateful that it dances at all.

Gulliver 1.22

Gulliver is an electronic itinerary sheet ($95, on a 1MB RAM card $135 [a very good deal]; True North, 603/673-5040). Plugging in flights and reservations can be quick fun and involve almost no handwriting: you just tap to select from Gulliver's pop-up lists of airlines, hotels, car-rental outfits, and so on. (It prominently displays 800 numbers, too.) A minute or so should cover the creation of a complete country-crisscrossing excursion.

Gulliver's features for use en route are hardly Lilliputian, either. The program keeps your frequent-flier numbers ready at a tap, calculates the length of each flight, tells you the local area code and NewtonMail phone number for each city, and even reminds you to reset your watch when you cross time zones. Plus there's a convenient slip for recording your incidental expenses (only a few stylus-taps less handy than ExpensePlus). Gulliver integrates neatly with the rest of your Newton miniworld, too: you can enter expenses by writing them on the Note Pad, copy departure times to your Date Book, and copy your entire itinerary to the Note Pad. I was a tad confused by Gulliver's use of the little X button, which sometimes means OK and sometimes means Cancel; otherwise, as a punster might say, Gulliver is pretty swift.

The Upshot

You'd be a happy wanderer indeed with clean, well-designed programs like Gulliver, ExpensePlus, and TimeReporter nestled on your Newton. Unfortunately, the Newton's attic space for software isn't what you'd call yawning: it's an absurdly puny 150K on the original models and 450K on the MessagePad 110. (Apple advertises larger capacities but then uses up most of it for its own system software.) Since these programs consume up to 350K apiece, you can understand why you must buy an expensive RAM-expansion card to use even one of them.

If you're unfazed by that added requirement, then this new crop of software will generally stick by you. Your finances and travels will at last be well in hand. **m**

Contributing editor DAVID POGUE is coauthor of the best-seller *Mac & Power Mac Secrets*, second edition (IDG Books Worldwide, 1994). It comes with 1100 pages, $300 worth of commercial software, and six Newton secrets.

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THE ICONOCLAST

BY STEVEN LEVY

emptyWorld

Apple's online service is a slow starter

LOGGING ON TO EWORLD, ONE experiences a sweet thrill of arrival. You are welcomed by the sound of traffic—a busy urban street with impatient motorists honking horns. And then the eWorld Town Square comes into focus, a quaintly drawn cartoon of a city center defined by a set of picturesque buildings. By simply clicking on one of these structures, you can enter a component of the eWorld universe. Cyberspace as real space. Interface as geography. For those few seconds, you are justified in thinking that there is something new under the virtual sun, and that Apple has fulfilled the promise implicit in its major enterprises—formerly arcane technology has been transmogrified into accessible, and delightful, art.

But that is the high point of a trip to eWorld, a tourist town that, at least in the days following its much-heralded rollout, hardly deserves a hotel stay. The Town Square turns out to be sort of a Potemkin village. Once you venture past the facades, the visual-geography representation is abandoned. As with almost every other online service, the metaphor of rooms and auditoriums and cafés is presented verbally, not graphically, and the cursor choices are words and icons, not map points. At its worst, the "places" you go with eWorld are throwbacks to the teletype days. I am thinking here of the implementation of Easy Saabre—the airline booking and information service is one of the most useful features of eWorld, but it retains its ancient command-based interface.

The contrast seems characteristic of the first days of eWorld. The designers of eWorld have obviously done some serious thinking about what an online service should be—this is apparent from the opening screen, the digitized sounds, and particularly the stylish visuals; they are clean, colorful, and generally consistent, a welcome evolutionary step from the previous standard, the interface of America Online. (Apple licensed AOL's software and built eWorld upon that bedrock.) And the implementers have also done some good work, making navigation relatively bug-free. They have recruited an eager, if somewhat goody-goody, band of online guides called the Community Conference Crew—a cyberspace version of a high-school pep squad, always willing to help puzzled frosh and extol the virtues of alma mater at every turn.

But my excursions into eWorld have convinced me that Apple has been too parsimonious in its initial offerings. All too often one encounters the dread hard-hat icon, indicating that a crucial feature is "under construction." Even worse is a paucity of content from the participants. One quickly learns that entering a conference room, a café, or an auditorium on eWorld results in a near empty screen, with a legend above noting "People Here: 1." (Meaning me. Alone again, cybernetically.) The asynchronous discussion boards, the heart of any online system, sit forlornly, waiting for replies to the few comments posted. On a hot conference system like the San Francisco Bay Area's WELL, topics commonly generate a hundred impassioned replies in a day; many Usenet groups pile up text quicker than Tom Clancy closing in on his next advance. eWorld moves more ponderously.

The charter denizens of eWorld, an endangered few, are painfully aware of this. One citizen, embarking on a long-distance move, closes a message with a hopeful encouragement: "Hang in there e-Ghostown!" Another eWorld traveler breathes a sign of relief so deeply that it resonates in cyberspace—"I finally found people," he says. "For a while there I thought I was playing Myst!"

Welcome, stranger, to emptyWorld.

Climbing the Curve

Now I know of course that any new service, just like a new settlement in a physical wilderness, will start with only the bare population base of its founders—every online service was empty at one time. But when beginning an online service in 1994, a time when millions of people have sampled the likes of CompuServe, Prodigy, and America Online—and millions more are keenly interested in what this Internet thing is all about—it is not enough just to open shop with a slick interface and a brand name that means something magical to about 14 percent of the computer market. The foundations of cyberspace have already been laid, by others.

Peter Friedman, general manager and director of Apple's online services, doesn't worry about this. He, in fact, professes delight with the very early response to the system. He explains that approximately 10,000 people were permitted to experiment with eWorld during a several-month beta period, and about half of those actually tried it for varying amounts of time. At the end of June, however, those accounts still active were notified that in order to continue they would thereafter be billed. Friedman proudly reported to me that "the vast majority" of beta testers who had significantly participated in the shakedown period signed up for the real thing, and in the first few weeks were visiting eWorld for longer periods than Apple had anticipated.

continues

"We have to appeal to the untapped market," Friedman says. "There are 100 million personal computers out there and between 3 and 5 million use online services." (He doesn't mention the 25 million Internet users.) By this reasoning, Friedman feels justified in stating flatly that the real competition for eWorld is not so much America Online, CompuServe, Prodigy, Delphi, and the like, but things like video games and television.

This attitude is reminiscent of the early days of the Macintosh, when marketing director Mike Murray would draw a bell curve on a blackboard, point to the beginning of the upward slope, and say, "That's where we are in personal computers." Then he'd explain why the masses of people that would reside on the summit of the hill would use the Macintosh. He was correct in saying that millions would buy computers, even correct about the need for a graphical interface; but for various reasons (primarily the sort of hubris that assumed the Mac's superiority would sell itself, even at premium prices) it is not the Apple product that the masses use. There is a lesson here for eWorld.

As Murray thought about the Macintosh, Friedman thinks that eWorld will prove so superior that it will win a solid percentage of those bell-curve climbers. The reason there are so few user attractions on eWorld at launch time, he says, is that Apple is taking time to make sure that every attraction is a quality one, consistent with Apple's high standards. Once everything is in place, and features will be added weekly, eWorld will draw in many more people. At first they will be Macintosh and Newton users, attracted by the various discussions, databases, and support services offered by Apple and its third-party community. In 1995, the service will roll out software for Windows users. Friedman concedes that it's not easy to explain why the Windows world would gravitate to a service not only oriented to Macintosh but run by Apple itself. But he believes that eWorld will be sufficiently superior to the alternatives that Windows users will flock to it.

So how will eWorld do this? Can it indeed gain a critical mass, especially when at launch time it charges full freight for a system under construction? (And the starting price is not exactly a loss leader—eWorld costs $8.95 a month, plus $4.95 per hour after the first two hours—with a further $2.95-per-hour surcharge if for some reason you want to use eWorld during the day.) There is its interface, which is very pretty, to be sure, but not really revolutionary. There are the services directed specifically toward Apple users, like databases of arcane bug-fixes, and the presence of third-party companies. But most people don't spend their leisure time seeking answers to computer-support questions. There are the usual assortment of stock prices, magazines, movie reviews, and so on. But other services offer these, currently in greater numbers. And though Apple promises innovation, its competitors are capable of innovation as well.

People Who Need People

Ultimately, the success of a service rests on its people. It is of course essential to sign up a solid number of information features, online magazines, and glittery guest speakers (eWorld should have done so as soon as it began charging its customers full freight), but the most important aspect of computer communications is its two-way nature. And this is where I see continuing problems for eWorld.

First of all, you simply need a sufficient number of people to keep discussions going. Friedman may be correct that most eWorld beta testers have remained on the service, but my unscientific measure of the conferences showed a falloff of comments from the time that Apple began to run the meter. I'll bet that many of the defectors were some of the people new users most wanted to talk to—journalists and celebrities in the Macintosh

continues

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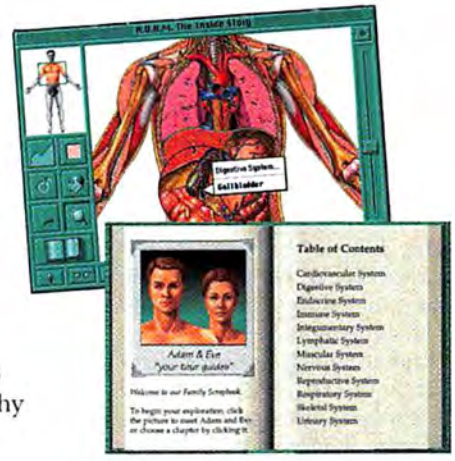

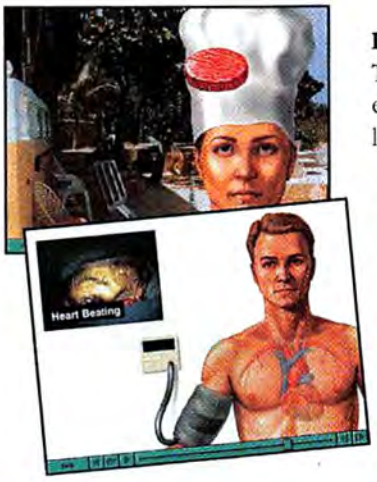

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community who would have added a bit of glitter to the proceedings.

Worse, the comments on the discussion boards seem desultory. It may well be that in individual conversation, eWorld users communicate with the pith of Dorothy Parker and the authority of Samuel Johnson. But as an aggregation they produce a lackluster bunch of comments. On a service run by Apple one would certainly expect a heated, or at least informed, discussion of issues concerning Apple itself. Nuh-uh. For that you'd be better off going to MAUG, the discussion group on CompuServe that seems to generate more chatter about the Macintosh in an hour than eWorld creates in a week—and a lot of it is inside stuff. (You will never see an Apple staffer, or anyone else, really, dish out hot dirt about his or her employer on eWorld because the service bans anonymity—and is therefore whistle-blower-proof.)

Perhaps the lackluster conversation is a function of eWorld's well-meaning but neo-draconian attempt to rid the service not only of anonymity but also of other practices that are oft abused in electronic communications. It would take more than half my column to list the sorts of things you shouldn't say or do on eWorld. Key sentence: "You are expressly prohibited from posting on eWorld any unlawful, inaccurate, threatening, libelous, obscene, profane, sexually offensive, or objectionable information of any kind, including encouraging use of controlled substances, that would constitute a criminal offense, give rise to civil liability, or otherwise violate any local, state, national, or international law." Objectionable information of any kind? Check, please.

"We're not into censorship or control, just standards," says Friedman. "We're trying to have less random noise, to be more focused."

It's a justifiable approach, but I don't know if it's a competitive one. Despite what anyone at Apple thinks, eWorld's marketplace opponents are not Jerry Seinfeld and Sonic the Hedgehog but every alternative that links a personal computer with a modem. The people who run America Online want the same customers, and they have a head start. CompuServe undoubtedly will improve its look and feel. Delphi offers cheap and deep Internet access, a crucial approach that eWorld is planning to enter only gradually. Some of the ultraliterate local services like The WELL in the Bay Area and ECHO in New York City are planning to expand, opening nodes in many cities. It appears that Microsoft will soon begin its own online service. And literally millions of people are discovering the pleasures of surfing the hypertext-like Mosaic software on the Internet.

That is simply the market reality. For too many years, Apple Computer has frittered away its technological lead by not taking the necessary steps to make its products absolutely irresistible. Believing it had superior products, the company felt no need to take painful measures such as price-cutting. I see the same mistake being made with eWorld, a promising system introduced rather late in the game. Instead of waiting for the world to find it, Apple should be playing a pocket-draining round of catch-up. This means dirt-cheap prices (particularly in these empty opening days), an aggressive effort to recruit gregarious and/or famous participants, a more concerted effort to eliminate those hard hats, a less scary subscriber agreement, and a full range of easy-to-use Internet connections.

Cyberspace is not for the timid. While eWorld carefully ramps up, everyone else is recklessly racing up the same incline like Evel Knievel on a motorcycle. Dramatic measures are called for. If Apple doesn't heed the call, all it will be left with is an empty world. **m**

STEVEN LEVY's latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).

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CONSPICUOUS CONSUMER

BY DEBORAH BRANSCUM

Authorized Macs by Mail

Apple changes its sales strategy—but does it offer enough choices?

EARLIER THIS YEAR APPLE announced a change in the way it sells computers. It now allows qualifying Apple dealers to sell Macintosh products by catalog. Apple also authorized a small number of mail-order-only companies to sell PowerBooks, Apple peripherals, and supplies. The company established the Apple Business Direct Program (800/462-7753), which sells Apple products directly to small-business customers. And in August Apple announced that traditional computer dealers will now sell Performas, the all-in-one computer-and-software bundles that were previously sold only by large retailers such as Sears and Circuit City.

These changes mean that consumers have more ways than ever to buy a Macintosh. Finally they can buy Macintoshes by mail through authorized dealers. Apple currently allows only dealers with stores to sell its entire product line by catalog; mail-order firms without stores are not permitted to sell desktop systems—at least not yet. The company says it plans to assess its mail-order program by October; it's possible that at that time it will allow mail-order-only stores to sell its full line.

Dealers versus Mail Order

Apple's mail-order effort is an attempt to broaden its sales channels without alienating the traditional computer dealers who are responsible for many of the Macintoshes sold. But it may be impossible to give consumers more choice without angering at least some dealers.

"I'd rather not have mail order authorized at all," says one Apple-authorized dealer, who asked not to be identified. "We go to the trouble and expense of leasing a storefront and getting demonstration machines. Mail-order companies have a financial advantage."

The dealer may go into catalog sales "as a defensive move," he says, adding that he fears that if Apple authorizes major mail-order companies to sell its full line, prices may fall so low that only businesses located in low-cost rural areas can survive. Moreover, he believes the success of Apple's push to gain market share is dependent on storefront dealers.

"What I think a consumer has to understand—and what's hard to understand because it goes against your pocketbook," says the dealer, "is that if you want to see a computer and touch it and see a demo and talk to someone knowledgeable . . . you need a store. And that costs money—not a lot more than mail order, but a percent or two." But this perspective isn't universal. While some dealers share his concerns, others say Apple will not win more market share unless it opens up all channels.

"I believe that channel expansion does grow the market and brings more people to this industry and to these products than not," says Alex Peder, executive vice president of Ballard Computer in Seattle. "I believe we are dealing with discretionary dollars, dollars that might be spent on a car or a vacation [instead of a computer]. To the degree that authorizing catalog companies to distribute the full line broadens the market, I'm all for that."

The Apple List

Many *Macworld* readers prefer buying both hardware and software by mail. So it's good news that you can buy Apple's product line from authorized dealers. The bad news is that buying a desktop Mac through the mail from an authorized dealer may not be as easy as buying a PowerBook from a company like MacWarehouse or MacConnection. Many of Apple's catalogers are not experienced mail-order firms but rather are resellers just beginning catalog sales or expanding regional catalogs. So some of the benefits associated with mail order—such as seven-day ordering, inexpensive shipping, and overnight delivery—may not be offered by all Apple catalog resellers. At the same time, authorized catalog companies may decide to offer services that traditional mail-order firms don't, such as out-of-warranty repair services by mail.

Several Apple dealers say they participate or plan to participate in catalog sales to individuals; these include Computer Town (800/666-0004) of Boston; Computize of Houston through its Syex Express division (800/289-7939); Computerware (800/326-0092) of Palo Alto, California; Crutchfield Corporation (800/955-9009) of Charlottesville, Virginia; Elektek (800/395-1000) of Skokie, Illinois; J & R Computer World (800/221-8180) of New York City; New MMI Corporation of Williamsport, Pennsylvania (800/221-4283); Oakbrook Computer of Oakbrook, Illinois, through its Technology Now division (800/566-9622); and Vanstar Corporation of Pleasanton, California, through its Computers 800 division (800/321-1234).

Currently at least two existing mail-order companies sell Apple's full line of products. Club Mac (800/258-2622), owned by Pacific Business Systems of Irvine, California, and Creative Computers' MacMall (800/222-2808) of Torrance, California, are owned by different Apple dealers that have been approved for catalog sales, so both carry desktop Macs as well as other Apple products.

continues

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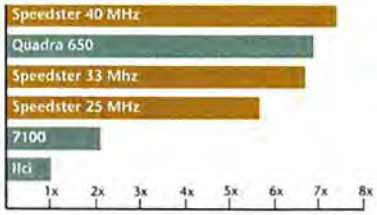

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The five mail-order-only companies authorized to sell selected PowerBook models, peripherals, and supplies are Computer Discount Warehouse (800/509-4239) of Buffalo Grove, Illinois; MacWarehouse (800/255-6227) of Norwalk, Connecticut; MacZone (800/684-8080) of Bellevue, Washington; Egghead Software–owned Mac's Place (406/758-8000) of Kalispell, Montana; and TigerSoftware (800/666-2562) of Coral Gables, Florida.

Authorized versus Gray Market

For mail-order Macs, consumers can now choose from different types of Apple dealers and so-called gray-market companies. Unlike authorized dealers, gray-market companies have no direct relationship with Apple and have not agreed to abide by specific Apple regulations in order to buy products directly from Apple for resale. As a result, authorized Apple dealers like to paint gray-market companies as outlaws—although the gray market is not illegal—and point out the low investment required to begin a mail-order business. Gray-marketeers, on the other hand, suggest authorized dealers have limited inventory, experience, and expertise.

Neither stereotype is entirely true or entirely false. A dealer's direct relationship with Apple can certainly be an advantage to consumers. "We have direct support from Apple, including technical support," says Sam Ryu, president of the Computize chain in Houston. If consumers have a problem with Computize, "since we value our authorization, they can directly complain to Apple, and Apple can have a direct handle on us by telling us to fix it." In contrast, says Ryu, "Apple doesn't have any influence on the gray-marketeer, so the customer has to rely on the goodwill of the gray-marketeer."

Moreover, as the mail-order industry consolidates, Apple's approval implies some level of review. That's usually difficult for consumers to do on their own but can be especially important on the mail-order side, where it's easy for individuals to go into business and sometimes even easier for them to go out of business.

On the plus side, because they don't buy inventory directly from Apple but rather from a broad range of authorized dealers, gray-marketeers may be able to get new machines that are not widely available through authorized dealers. David Goldman, president of Austin, Texas–based Bottom Line Distribution, says his company has an edge over Apple-authorized dealers because of its custom configurations and technical support. "Our solution to a conflict with a CD-ROM drive is not just to tell the customer to send us the CD-ROM drive and we'll replace it, because typically that's not the problem. . . . There's really a difference between offering solutions and selling products."

Other industry folks agree that a company's authorization doesn't automatically translate into a buyer's good mail-order experience, because retail sales and mail-order sales are very different businesses. "The fact that Apple has authorized a dealer doesn't necessarily mean it can provide good sales, technical support, and customer service by mail and over the telephone," says Mike McNeil, president of Club Mac, an authorized Apple cataloger.

All mail-order companies are not equal. Large, experienced gray-market companies may do an excellent job and provide better service than authorized dealers that are new to catalog sales. Even so, a fair number of *Macworld* readers get burned each year by unscrupulous, unauthorized mail-order companies. Apple's authorization will not guarantee a good experience, but it may offer some leverage if a company treats you badly. If that's important to you, buy from authorized dealers. (Call 800/538-9696 for verification.) Since you may not be able to depend on Apple for prompt technical support (I recently spent 33 minutes on hold), check out any dealer's support before you buy. And no matter where you buy, always use a credit card so you can dispute the charge if necessary.

Back to the Future

Alex Peder predicts that mail-order companies such MacWarehouse, MacConnection, and MacZone will eventually be authorized to sell the full Apple product line. "Broadening their channel strategy gives Apple greater market share," says Peder.

Consumers stand to benefit if Apple expands full authorization to established mail-order companies that can handle high-volume sales effectively and professionally. Ironically, though, Apple's tentative foray into mail order may have boosted the fortunes of gray-market companies as much as its own dealers'.

"People used to call up and ask, 'Is this gray market? Will I go to jail over this?'" according to Goldman. "Today, there's not the hesitation to buy mail order anymore, because Apple has said it's OK to buy by mail." **m**

Send nominees for sainthood to *Service Heroes, Macworld,* 501 Second St., San Francisco, CA 94107, or via the Internet (Branscum@AOL.com). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

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Edited by Elizabeth Maffly

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld*'s comparative articles. A ❖ next to a product indicates that we chose more than one product in that category. A ◀ next to a product listing indicates that a native Power Mac version is available.

Hardware

MONITORS

BLACK-AND-WHITE MONITORS, May 93

Portrait monitor: 15-inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4450; $399, with video-display board $549.

Two-page monitor: ❖ L-View MultiMode; Sigma Designs, 510/770-0100; $1099, with video-display board $1398. ❖ MD 202 Two Page Display; Mobius Technologies, 510/654-0556; $699, with video-display board $798.

SMALL COLOR MONITORS, Jan 94

14-inch display: ❖ Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95. ❖ Nanao FlexScan F340i•W; Nanao USA, 800/800-5202; $799.

15-inch display: NEC MultiSync 4FGe; NEC Technologies, 708/860-9500; estimated street price $755.

TWO-PAGE COLOR MONITORS, Nov 94

PressView 21 Display System; SuperMac Technology, 408/541-6100; $3999.

NETWORK HARDWARE

HIGH-SPEED FAX MODEMS, Oct 93

Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold $499, Silver $429.

REMOTE-ACCESS SERVERS, Oct 94

Mixed networks: NetConnect Remote Access Server; Asanté Technologies, 408/435-8401; $3899 for eight ports.

AppleTalk networks: ARA Multiport Server; Apple Computer, 408/996-1010; four ports $1799, eight ports $3298.

PRINTERS

COLOR PRINTERS, Aug 94

Low-end ink-jet: DeskWriter 560C; Hewlett-Packard, 800/752-0900; $719.

Solid ink-jet: Phaser 300i; Tektronix, 503/682-7377; $9995.

Thermal-wax transfer and color laser: Phaser 220i; Tektronix, 503/682-7377, $5995.

DYE-SUBLIMATION PRINTERS, Jul 94

Prepress proofing—tabloid size/fastest: Phaser 480; Tektronix, 503/682-7377; $14,995.

Prepress proofing—tabloid size/most complete: Rainbow; 3M, 612/733-1110; estimated street price of $20,000.

Prepress proofing—letter size: ProofPositive Full Page; SuperMac Technology, 408/541-6100; $7999.

General publishing and business: Phaser IISDX; Tektronix, 503/682-7377; $9995.

PERSONAL PRINTERS, Sep 94

Ink-Jet: DeskWriter 520; Hewlett-Packard, 800/752-0900; $365.

Laser—$1000 to $1600: microLaser Pro 600; Texas Instruments, 214/995-6611; $1599.

WORKGROUP PRINTERS, Feb 94

High-speed: Hewlett-Packard 4Si MX; Hewlett-Packard, 800/752-0900; $5499.

Best buy: ❖ Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; $2529. ❖ Hewlett-Packard LaserJet 4M; Hewlett-Packard, 800/752-0900; $2329.

SCANNERS/IMAGE CAPTURE

ELECTRONIC CAMERAS, Sep 94

Apple QuickTake 100; Apple Computer, 408/996-1010; $749. ◀

LOW-COST COLOR SCANNERS, Nov 93

$1300 to $1600: ❖ La Cie Silverscanner II; La Cie, 503/520-9000; $1599.

❖ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; $1599.

Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; $1299.

OCR, Nov 93

OmniPage Professional; Caere Corp., 408/395-7000; $995. ◀

SYSTEMS/STORAGE

DOUBLE-SPEED CD-ROM DRIVES, Jul 93

Sheer speed: Pioneer DRM-604X; Pioneer, 800/444-6784; $1495.

Overall value: AppleCD 300; Apple Computer, 408/996-1010; $599.

Budget choice: NEC MultiSpin 38; NEC Technologies, 708/860-9500; $465.

HIGH-SPEED HARD DRIVES, Aug 93

2.7GB drives: ❖ Nova XL 2700; Microtech International, 203/468-6223; $2999. ❖ Vista 3.5GB; Relax Technology, 510/471-6112; $3499.

SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; $499.

MACINTOSH UPGRADES, Jun 93

SE accelerator (25MHz): Quik30; Novy Systems, 904/427-2358; $449 (without FPU).

SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz $999 (with FPU), 33MHz $449 (without FPU).

LC and LC II upgrades: Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; $599.

Mac II accelerators: ❖ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i $1199, 33 $2499.

❖ Universal PowerCache series; DayStar Digital, 404/967-2077; $449 to $999.

IIfx SCSI accelerator: QuickSCSI; PLI, 800/288-8754; $499.

Quadra static-RAM cache card: FastCache Quadra; DayStar Digital, 404/967-2077; $299 for Quadra 700 and 900, $449 for Quadra 800 and 950.

OPTICAL DRIVES, Dec 93

3½-inch: ❖ Epson OMD 5010; ClubMac, 800/258-2622; $959.

❖ 128 MO; APS Technologies, 800/874-1428; $899.

5¼-inch: ❖ Sharp JY-750; ClubMac, 800/258-2622; $1829.

❖ Infinity MaxOptical 11m; Peripheral Land Inc., 800/288-8754; $4113.

PC COPROCESSING, Oct 94

OrangePC Model 210; Orange Micro, 714/779-2772; $1283.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94

Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; $599.

Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; $4499.

HIGH-END VIDEO EDITING, Jun 94

Presentation video: ❖ MoviePak2 Pro Suite; RasterOps, 801/785-5750; $4199. ❖ VideoVision Studio; Radius, 408/434-1010; $4499.

Corporate video (offline): Media Composer 400s; Avid Technology, 508/640-6789; $14,995.

Corporate video (online): VideoCube; ImMix, 916/272-9800; $40,500.

continues

MACWORLD Editors' Choice

PHOTOSHOP ACCELERATORS, Apr 94
PhotoBooster; Radius, 408/434-1010; $999.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business system: M.Y.O.B.; Teleware, 201/586-2200; $199.
Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

COMMUNICATIONS SOFTWARE, Aug 94
Basic connectivity: ZTerm; David P. Alverson (no phone number available); $30.
Terminal emulation: Crosstalk for Macintosh; Digital Communications Associates, 404/442-4000; $195.
Internet exploration: VersaTerm; Synergy Software, 215/779-0522; $125.

DOS WINDOWS EMULATION, Oct 94
Timbuktu Pro 1.0.3 for Macintosh, Timbuktu 1.1 for Windows; Farallon Computing, 510/814-5000; $199 each.

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93
Faxstf; Telefocus, 816/886-9800; $79.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

PROTOCOL ANALYZERS, Jul 94
EtherPeek, AG Group, 510/937-7900; $795.

SOFTWARE ROUTER, Jul 93
Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package $499.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

3-D DESIGN, Aug 93
Price for performance: ❖ Ray Dream Designer 2.0.4; Ray Dream, 415/960-0765; $299. ❖ Alias Sketch 1.5; Alias Research, 416/362-9181; $995.
All-in-one solution: ❖ Infini-D 2.5; Specular International, 413/253-3100; $695. ◀ ❖ StrataVision 3D 2.6.1; Strata, 801/628-5218; $995. ◀

CLIP ART'S GREATEST HITS, Jan 94
Overall collection: ❖ ClickArt Studio Series; T/Maker Company, 415/962-0195; $99.95 per volume. ❖ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; $67.50 per month. ❖ Metro ImageBase Electronic Clip Art; Metro ImageBase, 800/525-1552; $74.95 per volume, CD-ROM $149.95. ❖ Images with Impact series; 3G Graphics, 800/456-0234; $99.95 to $129.95 per volume, CD-ROM $499. ❖ Typographers' Ornaments; Underground Grammarian, 609/589-6477; $25 per volume; ten TIFF albums $200; EPS volumes $50 each.

DRAW PROGRAMS (LOW-COST), Sep 93
Budget draw: Expert Draw; Expert Software, 305/567-9990; $49.95.
Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; $79.
Beginners' program: Aldus SuperPaint; Aldus Corp., 619/558-6000; $149.95.
Overall: Canvas; Deneba Software, 305/596-5644; $399.

FONT BUYERS' GUIDE, Mar 94
Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400, 800/682-3623; $99 (includes the ability to unlock two families from preselected packages) plus $25 to unlock individual faces or $69 to $179 for unlocking families.
Display/decorative-face collection: Fontek; Letraset, 201/845-6100; $39.95 per face.
Bargain collection: Monotype ValuePack; Monotype, 312/855-1440; $89 for 57 fonts.

IMAGE DATABASES, Oct 93
❖ Aldus Fetch 1.0; Aldus Corp., 206/628-5739; $295. ❖ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; $249.

PAINT AND IMAGE-EDITING, Sep 93
Budget buy: Expert Color Paint; Expert Software, 305/567-9990; $49.95.
Overall program: Fractal Design Painter; Fractal Design Corp., 408/688-8800; $399. ◀
Image-editing program: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; $895. ◀

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClarisWorks; Claris Corporation, 408/727-8227; $299. ◀

Vendors: Please write to *Macworld Editors' Choice*, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

ONLINE SERVICES

ONLINE SERVICES, Aug 94
E-mail: America Online; America Online, 703/893-6288; basic monthly fee $9.95.
Reference: CompuServe; CompuServe Information Service, 614/457-0802; basic monthly fee $8.95.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93
Alarm system: ❖ First Things First; Visionary Software, 503/246-6200; $79.95.
❖ Smart Alarms Plus; JAM Software, 203/630-0055; $75.
All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; $99.
Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack $495.

GRAPHING SOFTWARE, Aug 94
DeltaGraph Pro 3 3.0.4; DeltaPoint, 408/648-4000; $195. ◀

SALES-AUTOMATION SOFTWARE, Oct 93
❖ Contact Ease; WestWare, 619/274-5053; one user $395, five users $1495. ❖ CBS; Colleague Business Software, 512/345-9964; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small system: On Location; On Technology, 617/374-1400; $129.
Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

PRESENTATION SOFTWARE, Jul 94
Persuasion 3.0; Aldus Corp., 206/622-5500; $495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.
Book-length documents: FrameReader; Frame Technology, 800/843-7263; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; $149.

VIRUS KILLERS, Jul 94
Commercial software: Virex; Datawatch, 919/549-0711; $99.95.
Free software: Disinfectant; free from online services.

VIRTUAL MEMORY SOFTWARE

VIRTUAL MEMORY, Jun 94
Virtual memory software: Virtual 3.0; Connectix Corp., 415/571-5100; $99.
Memory-boosting software: RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; $99. ◀ m

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Star Ratings

HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of *Macworld*'s authoritative product reviews from the past year. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones. The ◀ symbol indicates that a product is available in a native Power Mac version, although unless stated otherwise the version we reviewed was the 680X0 version.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★ **4D First 1.0 (1.0.1), ACI US, 408/252-4444, $295.** This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. It's not much easier to use, however, than the full-fledged 4D. May 94

★★★ **AccuZip6 1.8.7, Software Publishers, 800/233-0555, $689.** Bulk-mail software has informative progress indicators, batch and individual processing, low rates, and flexible parsing during import, but the interface is incomprehensible. Sep 94

★★ **BaseMap 1.0.1, GeoPoint, 415/957-1560, $149.** For simple maps displaying simple data, this map-making tool may be useful. It's not for the cartographic sophisticate, however, as it offers very limited data-display abilities and only one projection. May 94

★★ **Bulk Mailer CASS 1.00d, Satori Software, 206/443-0765, $150.** Unattended operation is possible with this inexpensive bulk-mail software, but batch processing is slow and the program has coding problems. Sep 94

★★★★ **ClarisImpact 1.0 (1.0 v3), Claris Corp., 408/727-8227, $399.** Business graphing, project management, object-oriented drawing, word processing, and presentation functions merge in this business graphics software. The outstanding integration offers versatility that dedicated programs are pressed to match. Jun 94 ◀

★★★ **Cricket Graph III 1.5 (1.52), Computer Associates International, 516/342-6000, $129.** Basic and foolproof charting program produces cleaner charts than Excel with little effort, although its feature set is fairly modest. Apr 94

★★★★ **Crystal Ball 3.0, Decisioneering, 303/449-5177, $295.** Compact business-simulation software is fast enough for complex projects and can pay for itself in disaster-avoidance in a large variety of common business tasks. Oct 94

★★★★ **DeltaGraph Pro 3 (3.5), DeltaPoint, 408/648-4000, $195.** At its new lower price, this charting program is the best feature-for-feature value in Macintosh charting. There's even a new Chart Advisor function that suggests the appropriate display for your data. Apr 94 ◀

★★★ **Extend+BPR 3.0, Imagine That, 408/365-0305, $990.** Business-modeling software includes a superior set of templates for business-process re-engineering, but it requires more than icon-based programming knowledge. Oct 94

★★★ **FastTrack Schedule 2.1, AEC Software, 703/450-1980, $279.** Simple project-management software is ideal for managers who must quickly put together a schedule, but if you require more power to manage conflicts between multiple projects and resource allocation, you'll need a more comprehensive program. Sep 94

★★★★ **Helix Express 2.0.1 (2.0.4), Helix Technologies, 708/465-0242, $589.** Icon-based relational-database software's improved performance makes it a serious competitor for all-Mac networks. Especially notable is its much faster speed; multiuser operation is downright snappy. Jul 94

★★★ **Helix Tracker 1.0, Helix Technologies, 708/465-0242, $439.** Well-designed workgroup-document manager has strong audit and annotation features. For large documents, however, Ethernet will look mighty attractive. Nov 93

★★★ **Map II 1.5, ThinkSpace, 519/858-5047, $395.** Well-structured program has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS and for alert first-time users who just like maps. May 94

★★★ **Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, $695.** When you require cross-project resource sharing and leveling for a reasonable price, this project-management software has the edge. Nov 93

★★★★ **Microsoft FoxPro for Macintosh 2.5 (2.6), Microsoft Corp., 206/882-8080, $495.** Dazzlingly fast and easy to use relational database has a greatly improved interface and cross-platform compatibility. For projects of 4 to 20 users that handle large amounts of data (hundreds of thousands to millions of records) it offers excellent performance. Apr 94

★★★ **Office Tracker 1.1, Milum Corp., 512/327-2255, $195 to $995.** The efficient user interface of this software sign-out board makes it easy to learn and use; but it has some minor flaws. Dec 93

★★★★ **Pablo 2.0.1 (2.03), Andyne Computing, 613/548-4355, $695.** This effective end-user data-reporting tool puts a considerable workload on the corporate information department, but it sidesteps the hassles of SQL data access and produces great reports with minimal effort. Jul 94

★★★ **Street Atlas USA 2.0, DeLorme Mapping, 207/865-1234, $169.** For the most part, this geographical information software delivers what it promises at a great price. Although inaccuracies in the data are troubling, DeLorme pledges to fix all reported errors in subsequent annual updates. Oct 94

★★★★ **TopDown 4.0 (4.1), Kaetron Software Corp., 713/298-1500, $345.** Flowcharting program's custom symbols, multiple palettes, and automatic drawing aids, and its ability to let you easily create and navigate lower-level charts, make it a productive tool. Jul 94

★★ **Useful Voice Processor for Macintosh 1.1v7 (1.1v9), Useful Software Corp., 508/774-8233, $179.95.** Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. Dec 93

★★★★ **ZipZapp 1.0, True Basic, 603/298-8517, $39.95.** You can use this data-reference utility to find an area code, the correct spelling of a city's name, and more. The interface is intuitive, and the cost, low. Oct 94

★★★ **ZP4 12.1 (14), Semaphore Corp., 408/688-9200, $125.** Inexpensive bulk-mail software supports batch and individual processing, but the progress indicators are uninformative, and unattended operation requires extra work. Sep 94

COMMUNICATIONS/NETWORKS

★★ **AccessPC 3.0, Insignia Solutions, 415/694-7600, $129.95.** Utility translates most word-processor and some database formats, but it doesn't translate graphics and some of its translations result in data loss. Apr 94

★★★ **Crosstalk for Macintosh 2.0 (2.0.1), Digital Communications Associates, 404/442-4095, $195.** Commendable communications product has a feature set that well matches its competition. Still, the script editing is complex and you must manually enter phone numbers each time you use it. Apr 94

★★★ **Delrina FaxPro for Macintosh 1.0 (1.5.1), Delrina Corp., 408/363-2345, $129.** Fast, efficient fax software has an excellent address-book feature but also has some interface quirks. Feb 94

★★★★ **DOS Mounter Plus 4.0, Dayna Communications, 801/269-7200, $100.** File-transfer and translation utility works with floppies, removable drives, and

continues

Star Ratings

network volumes and supports wild cards in DOS extensions. Apr 94

★★★★ **EtherPeek 2.0.3 (2.0.4), LocalPeek 2.0.3 (2.0.4), TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, $495 to $995.** Priced at a fraction of the cost of dedicated hardware analyzers, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. Jan 94

★★★★ **MacLink Plus/Translators Pro 7.5, DataViz, 203/268-0030, $149.** If your PC files are in archaic formats, you'll need this file-transfer and translation utility. It's a great option for most users, but it doesn't support removable drives or network volumes. Apr 94

★★★ **MicroPhone Pro 2.0, Software Ventures Corp., 510/644-3232, $295.** The new feature set of this communications package includes multiple sessions, faxing, TCP/IP networking, and more, but it's a mixed bag. Not all the features are well integrated, although some are innovations for which users will be grateful. Oct 94

★★★ **On The Road 1.1, Connectix, 415/571-5100, $99.** Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. Dec 93

★ **PowerShare Collaboration Servers, Apple Computer, 408/996-1010, $999.** Before this collaboration software will be ready for prime time, Apple needs to overhaul the complex Admin application, add serious diagnostic aids, provide comprehensive documentation, and offer knowledgeable technical support at a price less than that of the program itself. Aug 94

★★★★ **Silver Cloud 1.2 (1.2.1), AG Group, 510/937-7900, $495 to $1595.** If you are administrating a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. Feb 94

★★★ **SITcomm 1.0, Aladdin Systems, 408/761-6200, $120.** Inexpensive telecommunications software is fairly easy to set up and use, and will do well for people who use just one or two online services. Still, it lacks true scripting and has limited protocol options. Apr 94

★★★ **Snap Mail 1.01, Casady & Greene, 408/484-9228, $200 to $1440.** Software will put you on the electronic-mail trail more easily and more cheaply than any competing product, if you can live with some minor (but surprising) shortcomings. Jun 94

★★ **SoftPC 3.1, Insignia Solutions, 415/694-7600, $499.** While the speed of this Windows PC emulator is greatly improved, buying an add-in PC card for your Mac is more efficient. Mar 94

★★ **SoftWindows 1.0, Insignia Solutions, 415/694-7600, $499.** You can run Windows software on a Power Mac with this emulation software, but although it's a viable solution, you pay the price in terms of performance, compatibility, and actual cost. Aug 94

★★★★ **Timbuktu Pro 1.0 (1.05), Farallon Computing, 510/814-5000, $199 to $1999.** Terminal emulation product is a must-have for in-house technical-support staff and for people who need direct connection to computer systems on a variety of networks. The major enhancements of this version are TCP/IP support for Macs and noticeably faster screen redraw. May 94

★★ **TrafficWatch II 2.0 (2.1), Neon Software, 510/283-9771, $495.** The price of this AppleTalk traffic monitor is closer to that of full-blown network analyzers but without printing, alarms, or true multiprotocol support, this product misses the mark. Jun 94

★★★★ **VersaTerm 5.0 (5.04), Synergy Software, 215/779-0522, $195.** The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to Internet connectivity, this is it. Jan 94

DESKTOP PUBLISHING

★ **AboutFace 1.1.1 (1.1.2), Big Rock Software, 716/288-2860, $69.95.** Type-specimen generator has many serious deficiencies that need to be addressed. Jan 94

★★★★ **Aldus PageMaker 5.0, Aldus Corp., 206/622-5500, $895.** Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. This is a superb upgrade. Nov 93

★★★★ **FontChameleon 1.0.1, Ares Software Corp., 415/578-9090, $295.** Font utility introduces a new font-creation technology; it builds serif and sans serif fonts from a master outline file. It offers high-quality renditions of popular fonts, plus customizes fonts. Sep 94

★★★ **FontMixer 1.0, Monotype Typography, 312/855-1440, $79.** Although a tad expensive for a one-trick pony, this font utility is a straightforward, relatively painless way to mix characters from different fonts to create composite fonts. Oct 94

★★★★ **Fontographer 4.0.4, Altsys Corp., 214/680-2060, $495.** No other font editor does more or works better than this one. For the price of a few font families, it can give you a universe of unique faces. Oct 94

★★ **FotoTune 1.1 (1.13), Agfa Division of Miles, 508/658-5600, $395.** Color-management software has a capable engine, but it's not the complete color-management system Agfa touts. Apr 94

★★★★ **FrameMaker 4.0 (4.04), Frame Technology Corp., 408/433-3311, $895.** For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well mannered, and a real time-saver. Mar 94

★★★★ **Print Shop Deluxe 1.0 (1.1), Broderbund Software, 415/382-4400, $49.95.** Even the most ham-fingered can create professional-looking greeting cards, signs, banners, letterhead stationery, and calendars with these desktop publishing templates and graphics. While it's not a substitute for a high-end program, it is easy to use and inexpensive. Apr 94

★★★★ **QuarkXPress 3.2, Quark, 303/894-8888, $895.** This upgrade adds the EfiColor XTension to ensure the greatest possible fidelity of color images and is a must-have for professional color publishers who use Quark. For others, the enhancements are welcome but minor enough that they provide little incentive to upgrade. Nov 93

★★★ **ReadySetGo 6.0.2, Manhattan Graphics Corp., 914/725-2048, $395.** There's no strong reason not to use this desktop publishing software if its tools meet your needs, but there's no compelling reason to choose it over the competition, either. Its low price is nice, but not enough. Oct 94

★★★★ **Tableworks Plus 1.05, Npath, 206/392-7745, $299.** Publishing utility adds a full table-editor to QuarkXPress and is a must-have for anyone doing even mildly complex tables. Jan 94

EDUCATION

★★★ **Creative Writer 1.0, Microsoft Corp., 206/882-8080, $64.95.** Graphics/page-layout/word-processor hybrid offers some terrific type effects, zany sounds, bright graphics, and wacky characters. While it doesn't teach kids to be better writers, it does encourage them to develop ideas. Sep 94

★★★ **The Cruncher, Davidson & Associates, 310/793-0600, $59.95.** If you want to teach a child spreadsheet basics, this combination educational spreadsheet and business application will do the job. It's creative and easy to use, but slow. Aug 94

★★★★ **Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, $395.** CD-ROM encyclopedia has excellent search capabilities, weighs much less than a shelf of books, and is lots of fun. Its timeliness and some hierarchical snafus were slight problems. Jul 94

★★★★ **How Computers Work, Time Warner Interactive Group, 818/955-9999, $43.60.** Graceful, well-integrated CD-ROM tutorial guides the curious through brief but helpful explanations of basic computer technologies. Jan 94

★★★ **HyperStudio, Roger Wagner Publishing, 619/442-0522, $179.95.** Hypermedia authoring tool supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. Dec 93

★★★ **MacGrade 1.5.5 (2.2.7), CalEd Software, 800/795-0641, $85 to $245.** Grade-book program has a straightforward, simple interface and clear documentation. Although there's room for improvement, it's easy to use and flexible. Feb 94

★★★★ **The Rosetta Stone, Fairfield Language Technologies, 703/432-6166, $395.** Foreign-language instruction on CD-ROM is a valuable educational tool and fun to use. The lessons are well paced, and the content is generally excellent and diverse. Jan 94

★★★ **Small Blue Planet 1.2.1, Now What Software, 415/885-3432, $79.95.** Nicely integrated collection of beautiful Earth-from-space images on CD-ROM lacks many features of standard atlases and doesn't have a search function, but is endlessly fascinating. Jul 94

ENTERTAINMENT

★★★★ **Crystal Crazy, Casady & Greene, 408/484-9228, $49.95.** Ultraglossy, superpolished version of the classic Crystal Quest is challenging and fun. Each level retains some old elements, and adds some new ones to keep you on your toes. Jun 94

★★★★ **Falcon MC 1.0, Spectrum HoloByte, 510/522-1164, $69.95.** Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this flight simulator. Dec 93

★★★ **Firefall Arcade 1.0 (1.0.2), Inline Software, 617/935-1515, $49.95.** If you loved the classic video game Centipede, or are just looking for a fun shoot-'em-up, this arcade-style game will satisfy. Jun 94

★★★ **Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, $35.97.** Take a diabolical New York cabbie with a penchant for time travel, add a few brainteasers, and you've got this engaging game on CD-ROM. It's slow and the arcade sections are hard to control, but overall it succeeds. Jan 94

★★★★ **Myst 1.0 (1.01), Broderbund Software, 415/382-4400, $59.95.** The smooth pacing of actions and sounds in this beautiful CD-ROM game give it a dreamlike quality. This is a game that's been polished until it shines. Mar 94

★★★★ **SimCity 2000, Maxis Software, 510/254-9700, $54.95.** In essence, your goal with this marvelous city-simulation software is to build a city and run

it successfully. The game is fascinatingly complex, but it's simple to use, and the elaborate graphics are so lovely that it's even fun just to watch. **Jun 94**

★★★★ **Spectre Supreme, Velocity Development, 415/274-8840, $69.95 to $89.95.** The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. **Dec 93**

★★★★ **Spin Doctor (1.0), Callisto Corp., 508/655-0707, $59.95.** In the tradition of the best Macintosh games, this game tests your wits and reflexes alike. It's part strategy game, part kinetic sculpture. **Jun 94**

FINANCE/ACCOUNTING

★★★★ **Andrew Tobias' TaxCut 1993, MECA Software, 203/255-1441, $79.95.** The free-form approach and flexible Help menus of this tax-preparation software make filling out your tax return a smooth, almost relaxing process. The only state versions available are California and New York. **Apr 94**

★★★ **ExpensePlus 1.0.1 (1.0.2), State of the Art, 714/753-1222, $139.95.** Software uses a Newton MessagePad to record expenses, then sends the data to a Mac to create and print expense reports. While it's a real time-saver, you'll need AppleScript expertise to modify the expense reports. **Apr 94**

★★ **Financial Competence 1.5, Competence Software, 603/435-5098, $99.** This business economics tutorial explains how financial statements are compiled and how they relate to each other, but you could learn the same things from a book, faster and for less money. And that might just be the more financially competent thing to do. **Jul 94**

★★★★ **MacInTax 1993, Intuit, 602/295-3110, $69.95.** Tax-preparation software provides a reasonably detailed manual and a reliable, structured interface for building your tax return. Its inability to accept figures containing amounts in cents or round off to whole dollar amounts will frustrate some users. **Apr 94**

★★★ **MacInTax Tax Planner, Intuit, 602/295-3110, $29.95.** Software allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format. If you have a tax preparation program, you can do the same thing by creating alternative tax returns. **Apr 94**

★★★ **MacInTax Tax Savings Guide, Intuit, 602/295-3110, $19.95.** Simple, straightforward collection of well-written, fully indexed tax tips and suggestions is designed to help you better understand your tax return and reduce your tax liability. Although strong in content, it doesn't allow you to copy and paste, export as a text file, or even print. **Apr 94**

★★★ **MacMoney 4.01, Survivor Software, 310/410-9527, $89.95.** Personal-finance software has new and improved features that will please longtime users, but it hasn't kept up with the leaders in the field and won't win many new converts. **Jul 94**

★★★ **Managing Your Money 6.0, MECA Software, 203/255-1441, $79.95.** Personal-finance program does a good if somewhat roundabout job of keeping track of your total financial picture. Although it isn't as easy to use as the competition, it excels in tax, investment, and financial planning. **Jun 94**

★★★★ **Quicken 4, Intuit, 415/858-6095, $69.95.** Personal-finance software is powerful and easy to learn, even for a financial neophyte. Although slower than previous versions, 4.0 lives up to its promise of making financial chores easier and better organized. **Nov 93**

GRAPHICS

★★★★ **Adobe Illustrator 5.5, Adobe Systems, 415/961-4100, $595.** Despite slight speed disappointments, this draw program's upgrade is a bargain. It includes more than 200 tile patterns, 220 fonts, and the Acrobat Distiller and Exchange utilities. **Sep 94**

★★★★ **Aldus FreeHand 4.0 (4.0a), Aldus Corp., 206/622-5500, $595.** The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. **Mar 94**

★★★ **Canvas 3.5 (3.5.2), Deneba Software, 305/596-5644, $399.** Draw program offers two to three times as many features as any competing program, but our reviewer would prefer an interface that you can navigate without scrambling for the manual. **Jan 94**

★★★ **Collage 1.0.1 (2.0), Specular International, 413/253-3100, $399.** Image-compositing software is a flawed but serviceable tool that allows you to combine and composite multiple RGB images stored in PICT, TIFF, and Photoshop 2.5 formats. **Jul 94**

★★ **ColorUp 1.0, Pantone, 201/935-5500, $99.95.** Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. **Nov 93**

★★★★ **DeBabelizer 1.5 (1.5.5), Equilibrium Technologies, 415/332-4343, $299.** If you spend any significant time dealing with file conversion, you should have this bitmapped-graphics-conversion software. **Nov 93**

★★★★ **DeBabelizer Lite 1.0 (1.1), Equilibrium Technologies, 415/332-4343, $129.** Terrific graphics utility converts graphics files from one format to another. It offers a choice selection of capabilities at a nice, slim price. **Aug 94**

★★★ **DesignWorkshop 1.0 (1.1), Artifice, 503/345-7421, $895.** The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. **May 94**

★★★ **Infini-D 2.5.1 (2.6), Specular International, 413/253-3100, $695.** Serviceable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface and quick operating speed. **Feb 94**

★★★★ **IntelliDraw 2.0, Aldus Consumer Division, 619/558-6000, $129.** Wonderful general-purpose graphics package works well, does a great job of automating drawing tasks, and is straightforward. Despite its breadth of features, it always feels approachable. **Sep 94**

★★★★★ **Kai's Power Tools 2.0a (2.1), HSC Software, 310/392-8441, $199.** Phenomenally powerful suite of Photoshop plug-ins have an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate, the ways you can apply them, and the artwork you can create. **May 94**

★★★ **Koyn Fractal Studio 2.02, Koyn Software, 314/878-9125, $149.95.** Software lets you generate beautiful fractals of your own design. It's a reasonable choice if you are interested in Sierpinski triangles or naturalistic forms, but it's not an all-fractals-for-all-people program. **Aug 94**

★★★★ **MacroModel, Macromedia, 415/252-2000, $1495.** This 3-D modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegantly simple, making the Mac's inner space a more pleasant place to work. **May 94**

★★★★ **MetaFlo', The VALIS Group, 415/435-5404, $595.** Graphics utility yields interesting visual effects with a minimum of fuss. It imparts elasticity to 2-D images, letting you push and pull collections of pixels while retaining the visual integrity of the image. **Aug 94**

★★★★ **Paint Alchemy 1.0, Xaos Tools, 415/487-7000, $99.** For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little chaos into their work. **May 94**

★★★ **Pointillist, Pictor GraFX, 310/865-0495, $39.95.** Stereogram software creates images that look like random dots, but as you focus beyond the page, a 3-D image emerges from the pattern and appears to hover inches in front of the background. It's gleefully wacky. **Jul 94**

★★ **Ray Dream Designer 3.0.3 (3.1), Ray Dream, 415/960-0768, $349.** Although this 3-D–illustration software remains a price leader, unstable operation, misbehaving features, and sluggish performance are problems that need to be rectified. **Jul 94**

★★★★ **Scenery Animator 1.0.4 (1.1), Natural Graphics, 916/624-1436, $149.** Landscape rendering and animation software uses U.S. Geological Survey data to create remarkably realistic 3-D representations of terrain. Its flaws are few, and our reviewer recommends it. **Aug 94**

★★★★ **Showplace 2.0 (2.1), Pixar, 510/236-4000, $495.** Entry-level, 3-D modeler is suitable for illustration and other graphic arts applications. This version offers improved access to MacRenderMan, one of the best renderers around, plus plug-in modeling tools. **Apr 94**

★★★ **StrataVision 3d 2.6.3 (3.1), Strata, 801/628-5218, $695.** 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. **Feb 94**

★★★★ **StudioPro 1.0 (1.1), Strata, 801/628-5218, $1495.** If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this application is an excellent choice. **Mar 94**

★★★ **Transverter Pro 1.0 (1.51), TechPool, 216/291-1922, $395.** Remarkable graphics-conversion software can read PostScript files and convert them to a variety of formats. As you might expect of a program attempting to fill such a tall order, its conversions are not always flawless, but it can be a lifesaver nonetheless. **Nov 93**

★★★ **Typestry 2.0 (2.1), Pixar, 510/236-4000, $299.** An approachable interface, animation support, and outstanding Renderman rendering technology make this 3-D type-renderer a popular choice. This version still lacks canned positioning effects. **Jun 94**

★★★ **upFront 2.0, SketchTech, 612/379-9181, $299.** Capable modeler is something of an acquired taste. However, take the time to learn it and you'll find useful, if unconventional and demanding, tools that are well suited for architectural modeling. **Jan 94**

MATH/SCIENCE

★★★★ **Caduceus Science Review Macintosh Project 1.0 (1.1), Scientia, 617/776-3427, $250.** If you're taking the MCAT, you'd be nuts not to buy this interactive science review. With proper use, its 9MB of files are certain to improve your score. **Apr 94**

★★★★ **CSC ChemOffice 2.0, Cambridge Scientific Computing, 617/491-6862, $995.** Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost $200,000.

continues

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Star Ratings

It's a winner. Feb 94

★★★ **InStat 2.01, GraphPad Software, 619/457-3909, $95.** For scientists with limited statistics backgrounds, the chatty clarity of this lab-oriented statistics software's help screens will be invaluable, while the limited variables and minimal graphics won't be a problem. Nov 93

★★★★ **JMP 3.0, SAS Institute, 919/677-8000, $695.** This statistics software can be used for a wide range of biological, chemical, and physical-science investigations. New features include floating tool palettes, an annotation tool for data tables, and an experimental-design module. Sep 94

★★★★ **LabView for Mac 3.0.1, National Instruments, 512/338-9119, $1995.** For large-scale, demanding projects in data acquisition and analysis, this scientific software is an unchallenged standard, in a class by itself. Jul 94

★★★ **Maple V 3.0, Waterloo Maple Software, 519/747-2373, $795.** If you prefer to do your own programming and function creation, you'll benefit from this symbolic mathematics software's efficient use of your Mac's resources. This version hits most of the points on your symbolic-math wish list. Oct 94

★★★ **QC Tools 1.0, Abacus Concepts, 510/540-1949, $245.** Quality-control tool kit for StatView appears to introduce a slight slowdown in program response, but is well designed, well documented, and suitable for quality-control neophytes as well as professionals. Jan 94

★★★★ **Resampling Stats 1.0, Resampling Stats, Inc., 703/522-2713, $225.** Innovative statistics software has proved itself to be a superior teaching tool in numerous classroom tests. If you have any interest in statistics, you should give this admirably straightforward approach careful consideration. Jun 94

★★★★ **SerePlot 2.12, Scientfic Visions, 301/593-0317, $135.** If you have piles of data and don't need animated, exploding bar-charts in 24-bit color, this scriptable plotting software should be part of your analysis tool kit. Jun 94

★★★★ **Spyglass Plot 1.0, Spyglass, 217/355-6000, $295.** This scientific-charting software is the first choice for serious large-set plot crunching. Oct 94

★★★★ **SuperScope II 1.25, GW Instruments, 617/625-4096, $1490.** Despite a relatively small instrument library, this laboratory data-acquisition software effectively covers a wide range of needs, and learning to use it won't become your life's work. Oct 94

★★★★ **Turing's World 3.0, CSLI Publications, 312/568-1550, $19.95.** Computer-science educational software lets you investigate some fundamentals in computing at an almost unbelievable bargain price. Feb 94

★★★★ **Visualization of Natural Phenomena, Telos/Springer Verlag, 408/249-9314, $59.95.** CD-ROM introduction to applying all aspects of computer graphics to scientific imaging covers all disciplines and offers definitive analysis of methods. No other source covers this much material, at this level of clarity. Jan 94

ORGANIZATION/PRODUCTIVITY

★★★★ **Arrange 1.1 (2.0), Common Knowledge, 415/325-9900, $349.** This personal information database's flexible, intuitive approach to data-handling makes it an excellent tool for storing all kinds of day-to-day information. May 94

★★★★ **DateBook & TouchBase Pro Bundle 4.0, Aldus Consumer Division, 619/558-6000, $89.99.** Personal information manager package is now easier to use and offers many new features. The excellent linking between contacts and calendar is the most significant feature. Sep 94

★★★ **DateView 1.0.1 (1.0.2), Advanced Software, 515/225-4163, $99.95.** If you're willing to sacrifice some features to get simplicity and speed, this calendar/to-do manager makes sense. It integrates with the contact manager, InTouch. Aug 94

★★★ **Dynodex for Macintosh 3.5, Portfolio Software, 802/434-6400, $69.95.** Although this program doesn't currently link to a calendar, it's an excellent contact manager. This upgrade has a few new features, improved performance, and an easier interface. Sep 94

★★★ **Full Contact 2.01 (2.02), FIT Software, 408/562-5990, $169.** Personal information manager can handle with speed and style tasks that would choke other products, but frequently, using it feels like a full-time job. Aug 94

★★★★ **In Control 3.0.4, Attain Corp., 617/776-1110, $85.** Excellent to-do-list manager and outliner, coupled with a good calendar; a strong choice if you live and die by to-do lists. It does have some oddities, though, such as not allowing you to copy across views. Oct 94

★★★ **Now Contact 1.0 (1.1), Now Software, 503/274-2899, $69.** This contact manager has some innovative features and could easily become the top address-book program for the Mac by adding some features, such as file reconciliation. Mar 94

★★ **Rae Assist 1.0.2 (1.5), Rae Technology, 408/725-2850, $99.** Although this personal information manager offers some fresh ideas, including automatic linking of company and contact information, it's too big and too slow. Jan 94

★★★ **TimeSquare 1.0, Team Building Technologies, 514/278-3010, $149.** Fast, flexible, network calendar program has lots of handy features, but it's missing a few as well, such as multiday events and label grouping. Aug 94

PRESENTATION TOOLS

★★★★ **Adobe Premiere 3.0 (4.0), Adobe Systems, 415/961-4400, $695.** Solid and dependable QuickTime video-editing software offers a structured, responsive, and flexible interface with enhancements that range from the mundane to the dramatic. It can now mix 99 tracks. Jan 94

★★ **Animation Master 2.0.5, Hash Enterprises, 206/750-0042, $699.** Although this animation software packs extraordinary power at a reasonable price, it's needlessly difficult to learn and prone to instability. Oct 94

★★★★ **Astound 1.0, Gold Disk, 408/982-0200, $399.** Presentation software lets you include sound, text, and graphics animation with no more effort than pasting in a chart in other products. It's a good value. Nov 93

★★★★ **Authorware Professional 2.0.1, Macromedia, 415/252-2000, $4995.** Multimedia-scripting and -presentation software lets you develop complex presentations with amazing speed. Although expensive, it's wonderfully done and will pay for itself in time saved. Feb 94

★★★ **Avid VideoShop 2.0, Avid Technology, 508/640-6789, $499.** QuickTime video-editing program shines in its intuitive, easy-to-use interface, although it may fall short on features for hard-core video professionals. Feb 94

★★★ **Deck II 2.1, OSC, 415/252-0460, $399.** AV Macs turn into digital-audio workstations with this software that enables you to record, mix, modify, and play back CD-quality sound. It doesn't include equalization. Jun 94

★★ **Elastic Reality 1.0 (1.2), Elastic Reality, 608/273-6585, $349.95.** Exciting morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface, poor documentation, and inadequate tech support make that a difficult task. Feb 94

★★★★ **FlipBook 1.0, S. H. Pierce, 617/338-2222, $89.** Animation printing utility lets users make flip-books (consisting of a series of printed images that, through application of an extremely technical thumb-and-forefinger method, appear to move) out of QuickTime movies, PICS animations, and Scrapbook files. Jun 94

★★★ **HyperCard 2.2, Apple Computer, 408/996-1010, $249.** Authoring tool strikes a good balance between power and ease of use, and its price is reasonable. It may not satisfy all your wishes, but it should keep you happily building stacks until the next version comes along. Sep 94

★★★★ **Macromedia Director 4.0, Macromedia, 415/252-2000, $1195.** Although this multimedia program remains far from easy to use, this admirable upgrade increases the program's power and improves its interface. Multimedia professionals will continue to find it the best package available. Sep 94

★★★★ **Morph 2.0 (2.5), Gryphon Software, 619/454-6836, $239.** Easy to use morphing software is beautifully designed, with delightful new features, including the ability to morph QuickTime movies. Using it is as painless as morphing gets. Apr 94

★★ **MovieWorks 2.0.2, Interactive Solutions, 415/377-0136, $295.** With diligence you can get decent results with this all-in-one QuickTime-based multimedia package. But other entry-level programs make leaping into multimedia easier and more rewarding. Sep 94

★★★ **Passport Producer Pro 1.0 (1.1.2), Passport Designs, 415/726-0280, $995.** Superb, albeit quite expensive, media-integration package makes assembling even complex presentations surprisingly easy. Path animation is limited to entrances and exits. Apr 94

★★★★ **Persuasion 3.0, Aldus Corp., 206/622-5500, $339.** Users have plenty of new features to cheer about, including improved tool palettes, extensive charting options, and hypertext functions with this presentation graphics program's upgrade. High memory and disk-space requirements are drawbacks, however. Sep 94

★★★ **QuickFlix 1.0 (1.1.1), VideoFusion, 419/891-1090, $149.** Approachable QuickTime movie-making software lacks the high-end features of other programs but costs a whole lot less. Feb 94

PROGRAMMING

★★★★ **IDL 3.5, Research Systems, 303/786-9900, $1500.** In this shockingly powerful, compact, graphics-oriented, interpreted language, a single command is worth a page of C-language code. Oct 94

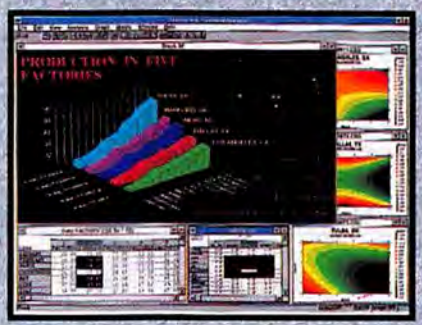
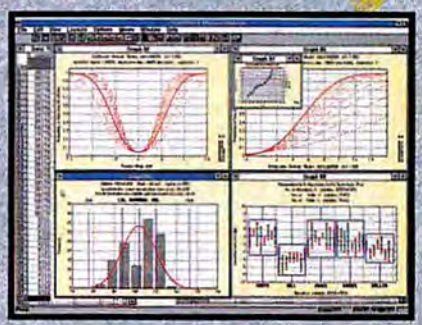
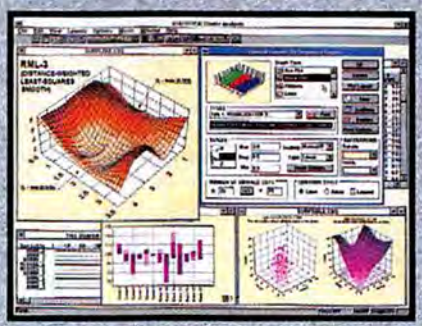
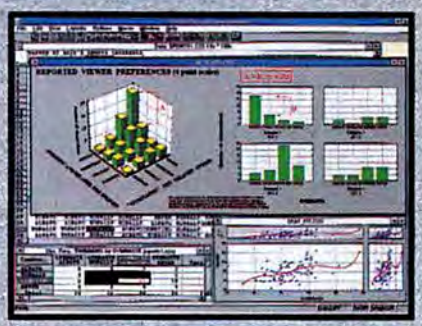
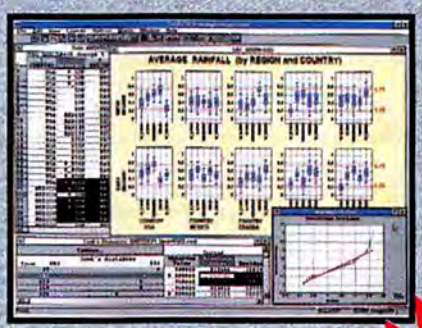
★★★★ **Object Master for Think C and C++, ACI US, 408/252-4444, $255.** Object-oriented development environment is full of goodies and will pay for itself in about a week due to increased programmer productivity. Apr 94

★★★★ **Smalltalk/V for Macintosh 2.0 (2.02), Digitalk, 714/513-3000, $495.** Object-oriented development system is now even more viable for commercial projects, while Digitalk's customer support and documentation set a standard other vendors should emulate. Feb 94

continues

STATISTICA/w

Windows, DOS, Macintosh

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Star Ratings

★★★★ **Symantec C++ for Macintosh 6.0 (7.0), Symantec Corp., 503/334-6054, $499.** If you like Think C, you'll like this software-development system, too. For the Mac, it's an excellent opportunity to catch a new wave in programming. Nov 93

★★★ **VIP BASIC 1.0.1 (1.0.3), Mainstay, 805/484-9400, $295.** Popular programming language lets programmers who know only BASIC get started producing real, if interpreted, Mac programs. It's a serious developer's tool, though it's not on the same footing as VIP-C. Jun 94

★★★★ **VIP-C 1.0.1 (1.5.1), Mainstay, 805/484-9400, $495.** If you've mastered the rudiments of C, this programming-code generator will let you code about ten times faster than you could using only an editor. Its real strength is in rapidly assembling smaller projects. May 94

UTILITIES

★★★ **AppleSearch 1.0, Apple Computer, 408/996-1010, $1799.** Although it has some rough edges, this product for archiving and retrieving text is highly useful. It presents retrieved information clearly and extracts text from documents in many formats. May 94

★★★ **Atticus Vista 1.0 (1.0.2), Atticus Software Corp., 203/348-6100, $69.95.** Control panel and application automatically catalog the disks you mount on the desktop. It has a few problems, including limited search options, but it can help bring order to disorganized disk collections. May 94

★★★★ **Automap Road Atlas for Macintosh 2.01 (2.04), Automap, 206/455-3552, $99.95.** Mapping software tells you how to get where you're going better than any other map or software our reviewer has seen. Although screen redraw is slow, it's worth it for the written directions and maps. Jul 94

★★★ **CD AllCache 2.0, CharisMac Engineering, 916/885-4420, $79.95.** CD-ROM accelerator improves access time by caching a CD's directory and putting its most frequently used data into RAM. Despite this software's limitations, most CD addicts will find the speed improvement worth the trouble. Sep 94

★★★★ **CD-ROM ToolKit 1.0.5 (1.1), FWB, 415/474-8055, $79.** Software accelerator can halve the time it takes to open files and search on a CD-ROM. Playback of QuickTime movies is often uneven. May 94

★★★★★ **Conflict Catcher II 2.1.1, Casady & Greene, 408/484-9228, $79.95.** Customizable, fast, and safe extension-management utility goes well beyond the basics. For Power Macintosh users, it even tells which extensions aren't written in native code and are likely to slow down Power Macs. Oct 94

★★★ **Connectix Desktop Utilities 1.0 (1.0.4), Connectix Corp., 415/571-5100, $99.** Although some of the 16 utilities offered in this package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. Nov 93

★★★ **Copyright Pro 1.0.3, CSG Technologies, 412/471-7170, $79.** Utility takes over the Finder's copying function, copies in the background, and allows you to regularly schedule copying. Nov 93

★★★ **CryptoMactic 1.01, Kent Marsh, 713/522-5625, $99.** Security software offers fast Finder-level encryption and decryption with effective file removal. Although its simplest encryption algorithm isn't quite hacker-proof, it's worth considering. Feb 94

★★★ **DiskDoubler 4.0, Symantec Corp., 503/334-6054, $79.95.** In pure efficiency terms, this file-compression software is a winner, but it lacks many features of previous versions, including passwords on self-extracting files and automatic recompression. Aug 94

★★★★ **DiskLock PB 1.0 (3.0), Symantec/Fifth Generation Systems, 503/334-6054, $99.** PowerBook security software balances robust security with simplicity and ease of use. It's much harder to crack than most PowerBook utility collections' security features, and will keep out all but the most determined. Jan 94

★★★★ **DiskTop 4.5 (4.5.1), PrairieSoft, 515/225-3720, $99.95.** Organizing a crammed hard drive is a more manageable task with this simple but powerful file-management utility that lets you copy, move, rename, delete, and find files—without using the Finder. Jul 94

★★★ **The Disney Collection Screen Saver, Berkeley Systems, 510/540-5535, $49.99.** Mickey, Goofy, Peter Pan, Ariel, and other Disney favorites cavort around your screen with this screen saver that includes 16 different modules. Mar 94

★★★ **DriveShare 1.03, Casa Blanca Works, 415/461-2227, $129.95.** This utility allows users to share a removable drive over a network. It's most useful if your network consists of both System 6 and System 7 users, as its advantages over System 7 file sharing are slight. Nov 93

★ **DriveTech 1.0, MicroMat Computer Systems, 415/898-6227, $59.95.** Without decent documentation or clearer error messages, this floppy-drive cleaning and diagnostic program is essentially a $60 floppy-drive cleaning kit. Since you can buy a cleaning kit without software for $10, that makes it a bad deal. Jan 94

★★★ **DupLocator 1.03, Midnight Software, 303/933-1013, $99.** For new Macintosh users who don't have a general file utility, this software that locates duplicate files, as well as performs basic file commands such as moving and renaming files, may be useful. Jan 94

★★★ **Icon-It Pro 3.0.6, Olduvai Corp., 305/670-1112, $129.** Utility allows you to attach custom tool bars to almost any application, including the Finder. The interface is quirky, but you get used to it. Dec 93

★★★★ **Icon Mania 1.0 (1.01), Dubl-Click Software, 503/317-0355, $69.95.** Delightful icon-editing utility comes with terrific tools for building new icons, including an outstanding thumbnail feature that builds custom icons from graphics files. Aug 94

★★★★ **MacTools 3.0, Central Point Software, 503/690-8090, $149.** Recovering trashed files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. Mar 94

★★★★ **Mr. File 2.0, Softways, 408/978-9167, $99.** The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quirks. Dec 93

★★★ **Now Compress 1.0 (1.0.1), Now Software, 503/274-2899, $69.** Compression utility holds its own in a crowded market; it's easy to use, it's complete, and it compresses as well as other options. Dec 93

★★★ **Now Fun, Now Software, 503/274-2899, $45.** Five control panels let you liven up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns and pictures are fairly limited, though. Dec 93

★★★ **Open Sesame 1.02 (1.1), Charles River Analytics, 617/491-3474, $99.** Utility automates Finder operations, such as opening files, without resorting to macros. It has an elegant interface, but people with strict work habits are more likely to find its suggestions worthwhile than are those who don't follow a routine. May 94

★★★ **OptiMem 1.4.1 (1.5.6f), Jump Development Group, 412/681-2692, $129.** Systemwide memory manager monitors RAM use and allocates RAM where it's needed. Works best with software that handles minimum-memory situations effectively. Mar 94

★★★ **PopupFolder 1.0 (1.5), Inline Software, 617/935-1515, $59.95.** Finder utility is so handy and easy to use, you wonder why it isn't built into the Mac's system software. On the other hand, it's sluggish when readying pop-up menus for every folder. Aug 94

★★★★ **PowerMerge 2.0, Leader Technologies, 714/757-1787, $129.** Powerful file-management tool helps you keep individual files, folders, or entire volumes organized and up-to-date. This version lets you compare and launch documents, rename files, trash superfluous files, and lots more. Aug 94

★★★ **Power To Go 2.0, Claris Corp., 408/727-8227, $39.** PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It does lack features of similar products. Dec 93

★★★ **ProFiles 1.0, Dayna Communications, 801/269-7200, $129.** Unusual new utility lets you group related files and folders for quick access and actions such as making aliases, copying, turning sharing on and off, and more. The recommended RAM allocation of 1MB may be a problem for computers with limited memory. Aug 94

★★★★ **QuicKeys 3.0, CE Software, 515/221-1801, $139.** The simple, unintimidating interface of this macro-building utility allows you to build a set of useful shortcuts quickly. Mar 94

★★★★ **RAM Doubler 1.0.1 (1.5), Connectix Corp., 415/571-5100, $99.** Inexpensive system extension doubles available RAM for many Mac users. There are a number of requirements, however, including System 7, 4MB of physical RAM, and a 68030 board. May 94

★★★ **Redux Deluxe 2.0.2 (2.5.1), Inline Software, 617/935-1515, $79.95.** Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn't have a compression option. Jan 94

★★★★ **SAM 3.5.8 (4.0), Symantec Corp., 503/334-6054, $99.** Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. Mar 94

★★★★ **Screenscapes 1.0.1, Kiwi Software, 805/685-4031, $44.95.** With more than 600 desktop patterns—and a suite of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. Nov 93

★★ **SCSI Director Pro 3.0.6, Transoft Corp., 805/565-5200, $99.** Utility provides simple, one-button hard disk formatting, but when it comes to doing some of the fancy tricks described on the box, the going gets rough and technical support costs $1.90 per minute. Sep 94

★★★ **Stop & Go 4.0, Engram International, 415/455-1100, $69.99.** File-protection/relaunch utility uses a portion of your hard disk to save a snapshot of the data in your Mac's RAM. It's fast, and it relaunches files, applications, and extensions in a single, unified process, but it's unduly complicated. Oct 94

★★★ **Tempo II Plus 3.0.9 (3.0.9a), Affinity Microsystems, 303/442-4840, $179.95.** Very capable macro-creating utility may be daunting for novices but offers plenty of power for advanced users. Mar 94

★★★★ **TimesTwo 2.0, Golden Triangle Computers, 619/587-0110, $149.** This driver-level compression utility is transparent and robust. It caused no problems through a two-month course of testing, on a sys-

continues

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Circle 46 on reader service card

Star Ratings

tem with myriad utilities and system software tools. Mar 94

★★★★ **Toner Tuner 1.0.3 (1.06), Working Software, 408/423-5696, $24.95.** Inexpensive, incredibly useful extension adds a sliding bar to print dialog boxes allowing you to adjust the amount of toner applied to each print job. If you can't save trees, you can at least save toner. Dec 93

★★★★ **ultraShield 1.252 (2.0), usrEZ Software, 714/756-5140, $149.** Sophisticated security product combines practically every feature you might need into an integrated package. Dec 93

★★★ **UnderWare 1.0.1, Bit Jugglers, 415/968-3908, $59.95.** Inspired, silly fun for your Mac's desktop comes from a control panel that adds three features: a screen saver, desktop patterns, and animations that run on your desktop while you work. The price for this whimsy is mostly in disk space. Jun 94

★★★★ **Virex 5.0 (5.03), Datawatch Corp., 919/549-0711, $99.95.** The extremely fast, trouble-free performance of this software makes the task of guarding against computer viruses almost painless. Its speed puts it ahead of the pack. May 94

★★★★ **VirtualDisk 1.1a (2.0), Continuum Software, 206/695-8136, $79.** Rapid disk cataloging; fast, efficient label-printing; and an excellent disk-copy utility make this software package a wonderful value. Jul 94

★★★ **Working Watermarker 1.02 (1.06), Working Software, 408/423-5696, $49.95.** Simple, useful system extension allows you to print or fax text and/or graphics "watermarks" in the background of virtually any document. Although it has imperfections, it's earned a permanent spot in our reviewer's System Folder. Jan 94

VERTICAL MARKETS

★★★★ **Claire, The Personal Music Coach 1.0.1, Opcode Systems, 415/856-3333, $129.95.** Musicianship program teaches pitch and interval recognition, sight singing, and intonation. Although the interface is nonstandard, it's logical and easy to learn. May 94

★★★★ **Finale 3.0.1, Coda Music Technology, 800/843-2066, $749.** Upgraded music-notation software is now infinitely more pleasant to use. Its comprehensive feature set makes it the standard against which all other music-notation products must be judged. Dec 93

★★ **MacInteriors 1.0 (1.2), Microspot, 408/253-2000, $129.** Correctly placing objects is unduly cumbersome in this interior-design software, but once you catch on to the program's quirks, it's useful. Feb 94

★★★★ **Mayo Clinic Family Health Book 1.2, IVI Publishing, 612/686-0779, $69.95.** Medical CD-ROM for home use deals with the full gamut of health-care topics, from AIDS to zygotes, although it doesn't include any reference to alternative therapies. Sep 94

★★★ **Mayo Clinic: The Total Heart 1.0, IVI Publishing, 612/686-0779, $59.95.** Cardiovascular health and related subjects are the topics of this medical CD-ROM for home use. Although it makes liberal use of drawings, photographs, and animations, video sequences would have been more effective. Sep 94

★★★ **MusicTime 2.0, Passport Designs, 415/726-0280, $149 to $249.** Music-notation program is geared for hobbyists and students. If your needs aren't complex, it may fit the bill, at a great price. Oct 94

★★★ **Sailing Master 1.1, Starboard Software, 313/662-4393, $64.99.** Though the slow speed and jerky motion point to less-than-polished programming, this sailboat-racing simulation offers good tactical play and is fun—well worth the price for sailing competitors. Nov 93

★★★ **SAM-CD, Scientific American Medicine, 212/754-0550, $395.** Despite a few shortcomings, such as the poor interface for case simulations, this medical reference work—a popular series of publications covering topics in clinical medicine—should prove a worthwhile addition to any medical library. Sep 94

★★★★ **WillMaker 5.0, Nolo Press, 510/549-1976, $69.95.** Legal software quickly and easily automates the creation of wills, health-care directives and proxies, and final-arrangements documents. It offers excellent supporting explanations and background. Jun 94

WRITING TOOLS

★★★★ **MacWrite Pro 1.5 (1.5 v2), Claris Corp., 408/727-8227, $249.** The clean, uncluttered interface of this low- to middle-level word processor is still one of its major assets. This upgrade adds support for QuickTime, PowerTalk, AppleScript, and more. May 94

★ **The Oxford English Dictionary, Oxford University Press, Electronic Publishing, 212/679-7300 ext. 7370, $895.** CD-ROM dictionary contains 20 print volumes, including half a million words, but the flaws, omissions, unreliability, and unforgivably poor design are unbearable. Apr 94

★★★ **Random House Unabridged Dictionary, Random House Electronic Publishing, 212/572-2600, $179.** The most comprehensive American-made dictionary on CD-ROM works within any program and is good at guessing misspelled words. Although some functions don't work reliably, the quality and design of the software are better than those of other dictionaries on CD-ROM. May 94

★★★ **TextBridge 2.0, Xerox Imaging Systems, 508/977-2000, $99.** Optical character recognition software is impressive on good documents and can be trained and automated. You won't find that anywhere else at this price. Sep 94

★★★★ **Thunder 7 1.5.3, Baseline Publishing, 901/682-9676, $99.95.** Stand-alone spelling checker and thesaurus interactively monitors your keystrokes and alerts you to potential errors as they are entered. It quickly and transparently prevents you from making embarrassing typos. Nov 93

★★★★ **WordPerfect for Macintosh 3.0 (3.0a), WordPerfect Corp., 801/225-5000, $495.** The innovative interface of this word processor uses context-sensitive button bars and expandable rulers to make innumerable features accessible with a click of the mouse. It's an accomplishment in ease of use. Mar 94

★★★★ **WriteNow 4.0.1, WordStar International, 617/494-1200, $119.95.** Tidy word processor's conservative use of memory (the application fits into a dainty 600K partition) and graceful interface will continue to win it enthusiastic fans. This version adds elegant table capabilities and PowerBook-friendly features. Jun 94

★★★ **A Zillion Kajillion Rhymes 1.0, Eccentric Software, 206/628-2687, $49.95.** Rhyming dictionary is quick, small, simple, and self-contained; but it only rhymes with the roots of search words (and ignores *-ed, -s,* and *-ing* endings). Nov 93

Hardware

INPUT DEVICES

★★★ **DrawingSlate, CalComp Digitizer Division, 714/821-2000, $395.** Digitizing tablet is a good, compact, low-cost implementation of pressure sensitivity, although the battery-operated stylus is a bit heavy. Jun 94

★★★ **Ear Phone Streamline AV, Jabra Corp., 619/622-0764, $169.** As a hands-free telephony tool—and as a replacement for the Apple PlainTalk microphone—this telephone/speech-recognition earpiece is a winner. Its biggest drawback is that you can't hear other Mac sounds, such as modem tones, when it's plugged in. Jul 94

★★★ **PenDirect ADB, FTG Data Systems, 714/995-3900, $398.** Input device lets you manipulate items on the Macintosh screen using a special stylus called a light pen. It works well, although it seems ergonomically inferior to a mouse for routine tasks. Mar 94

★★★ **TrakMate, Key Tronic Corp., 509/928-8000, $149.** Input device integrates a trackball into a wrist pad. While the design is interesting, it's not for everyone. Feb 94

★★★ **Wacom UD-1212R, Wacom Technology Corp., 206/750-8882, $749.** Graphics tablet with pressure-sensitive stylus is easy to use and highly customizable, though it's incompatible with AppleTalk and AppleTalk Remote. May 94

MISCELLANEOUS HARDWARE

★★ **ACS100, Altec Lansing Consumer Products, 717/296-2818, $180.** Lightweight powered speakers don't sound as good as they should. There's too much emphasis on the high end at the expense of the midrange, and they hiss noticeably. Dec 93

★★ **ACS150, Altec Lansing Consumer Products, 717/296-2818, $150.** Subwoofer rounds out the sharp tones of the ACS100, but the bass response is neither punchy enough nor loud enough, and the unit is about the size and weight of a concrete block. Dec 93

★★★ **AppleDesign Powered Speakers, Apple Computer, 408/996-1010, $179.** Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. Dec 93

★★★ **Apple Newton MessagePad, Apple Computer, 408/996-1010, $699.** Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very intelligent piece of work with an impressive variety of serious business uses. Dec 93

★★★ **Apple PowerCD, Apple Computer, 408/996-1010, $400.** This extremely versatile and beautifully designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you're a serious CD-ROM user, it's too slow to satisfy. Jan 94

★★ **G-Vox, Lyrrus, 215/922-0880, $399.** Hardware-software guitar-instruction package lets your Mac "hear" the notes you play on your guitar. Although the hardware works well, the software has some basic problems and doesn't live up to the hardware. Apr 94

★★★ **Hello Music, Yamaha Corp. of America, 714/522-9240, $449.** MIDI starter kit includes an impressive tone generator that's compatible with General MIDI Level 1 and Roland MT-32, but the included software is functional at best. Dec 93

★★ **Macintosh TV, Apple Computer, 408/996-1010, $2079.** As a computer, this combination computer-television-CD player is sleek but slow. You can get faster performance and better expandability from several less-expensive Performa models. Apr 94

★★★ **PowerLink Presentor, E-Machines, 503/**

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Circle 297 on reader service card

Star Ratings

646-6699, $499. Simple, compact Duo dock wobbles a bit but provides fine support for a variety of displays, plus ports for ADB, floppy drive, and sound output. **Nov 93**

★★★ **PowerPlate, Technöggin, 513/321-1777, $169.95 to $299.95.** Line of long-lived, external PowerBook battery packs, each of which lets you work for three to five times as long as the usual PowerBook battery. Unfortunately, the System 7 power manager periodically alerts you that your battery is not charging and dims the screen though battery pack has hours of time left. **Mar 94**

★★★ **RCD-202, Pinnacle Micro, 714/727-3300, $2495.** Writable CD-ROM drive is good for archiving data simply and inexpensively, but it's incompatible with many hard drives. **Mar 94**

★★★★ **SCSI Sentry, APS Technologies, 816/483-6100, $99.** Although the price of this terminator may seem steep, this device may well be the cure for SCSI woes. Our reviewer heartily recommends it. **Sep 94**

★★★★ **ThinPack, VST Power Systems, 508/287-4600, $199.95.** External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. **Mar 94**

★★★★ **TurboDialer, Advanced Software, 408/733-2364, $69.95.** Automatic telephone dialer is a well-executed product, except for occasional computer noise that seeps into phone conversations. If you constantly dial phone numbers that are stored in your computer, this product will save you time and energy. **Jul 94**

★★★★ **Yamaha YST-M10 Powered Monitor Speakers, Yamaha, 714/522-9240, $149.95.** Powered speakers have a good balanced sound and a great volume range at an outstanding price. **Apr 94**

MODEMS/NETWORK HARDWARE

★★★★ **AsantéHub 1012, Asanté Technologies, 408/435-8388, $1299.** This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. **Dec 93**

★★★★ **Cypress PhonePro 1.2 (1.4), Cypress Research Corp., 408/752-2700, $349 to $950.** By improving its integration with FaxPro and with PowerTalk and PowerShare, this powerful telephony software has greatly extended its business scope. **May 94**

★★★ **DataLink PB; Axcell Cellular Interface, Applied Engineering, 214/241-6060, $824.** If you need a full-blown office on the beach, this PowerBook cellular-modem package with automatic answering machine is a well-executed solution. Each recorded second requires 25K of disk space. **Nov 93**

★★★★★ **EtherWave, Farallon Computing, 510/814-5000, $129.** If you need to expand your network at a reasonable price with minimal fuss, get this Ethernet transceiver. Instead of providing only one 10BaseT twisted-pair jack, it includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. **May 94**

★★★ **OneWorld Fax, Global Village Communication, 415/390-8200, $999.** Easy-to-use network fax product lets an office share fax-sending resources without dedicating a hard drive and CPU; however, it can't receive faxes and can't queue more than one fax document at a time from a single CPU. **Aug 94**

★★★ **PerFit Port-A-Com, PerFit, 303/530-7333, $349.** Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but is still a solid product at a reasonable price. **Nov 93**

★★★ **Spectra-Com P192mx, Bay Connection, 408/270-8070, $199.95.** If you must have absolute portability and AC power isn't available, this pocket data/fax modem can do the job. It's not that much smaller than a regular desktop modem, however. **Oct 94**

★★★ **SupraFaxModem 144PB, Supra Corp., 503/967-2400, $349.95.** If you're looking for a high-speed internal modem for your PowerBook, and you want to save a few bucks, this modem is worth considering. Disabling its fax software solved occasional transfer problems. **Nov 93**

★★★★ **SupraFaxModem 288, Supra Corp., 503/967-2410, $329.95.** This 28,800-bps fax modem is a very good performer, as good as or better than 14,400-bps modems, and the price of admission isn't terribly steep. Combined with fast, stable fax software and a good terminal program, it's hard to beat. **Aug 94**

★★★ **Watermark Message Central 2.0.2, High Tide Software, 510/704-9927, $499.** If you're willing to put in a lot of effort, you'll find this highly sophisticated voice-mail system supremely flexible. It includes a specially modified modem with voice chip, as well as fax software and telecommunications software. **Jul 94**

PRINTERS

★★★★ **Apple Portable StyleWriter, Apple Computer, 408/996-1010, $439.** Sleek, portable ink-jet printer weighs 4½ pounds and is a pleasure to use. It uses standard StyleWriter cartridges. **Jan 94**

★★ **Brother HJ-400, Brother International, 908/356-8880, $369.** Compact, 360-dpi ink-jet printer is fairly slow and does not allow background printing. Some large files require additional application memory to print correctly. **May 94**

★★★★ **Color StyleWriter Pro, Apple Computer, 408/996-1010, $629.** Color printer represents one of the best values in the inexpensive color-printing market. It's fast, produces nice-looking output, and has some good features, including a great way of handling color ink cartridges. **Sep 94**

★★★★ **DeskWriter 310, Hewlett-Packard, 800/752-0900, $379 to $455.** Versatile, low-cost ink-jet printer is a 4.3-pound, battery-powered portable. With its 60-page sheet feeder, it's also a great desktop printer; and with a $49 color print cartridge, it offers inexpensive three-color printing. **Mar 94**

★★★ **HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, $1279.** Primarily for those of you who use a PC or work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. Its advanced PC features may not be worthwhile for those who use Macs only. **May 94**

★★★★★ **LaserWriter Select 360, Apple Computer, 408/996-1010, $1599.** Low-cost, high-performance, 10-ppm printer is perfect for small LocalTalk or mixed networks. For bigger networks, consider buying more than one; they're more cost-effective than a 20-ppm printer. **Apr 94**

★★★ **MobileWriterPS, Mannesmann Tally Corp., 206/251-5524, $999.** Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy laser paper, it's mediocre on inexpensive bond. **Dec 93**

★★ **Notebook Printer II, Citizen America, 310/453-0614, $399.** If weight and size are your biggest concerns in choosing a portable printer, and you print primarily in black and white, this thermal-fusion printer may be a good choice. If speed is at all an issue, however, other options may be preferable. **Jun 94**

★★★★ **Personal LaserWriter 320, Apple Computer, 408/996-1010, $959.** If you've been holding out for a high-quality personal laser printer that's fast enough to share over LocalTalk, the small inconveniences of this 300-dpi printer are easily outweighed by its low price, good speed, and PostScript Level 2 support. **May 94**

★★★★ **PowerPrint 2.5, GDT Softworks, 604/291-9121, $149.** Ingenious hardware-software combo lets you print from your Mac to almost any PC printer. It supports over 1000 printers, ranging from aging dot matrix models to the newer color ink-jet and laser printers. **Sep 94**

★★★ **P-Touch PC, Brother International Corp., 908/356-8880, ext. 4307, $449.95.** Versatile label printer is easy to set up and use, and produces high-quality output. The cost per label is high, though, and the documentation is weak. **Sep 94**

★★ **QMS ColorScript Laser 1000, QMS, 205/633-4300, $7999.** Color laser printer succeeds in combining the versatility of monochrome laser printing with attention-getting color, but if you don't need to chase rainbows right away, you might wait and see if competition drives capabilities up. **Jul 94**

★★★ **Silentwriter 640, NEC Technologies, 508/264-8000, $825.** With 3MB of RAM, PostScript Level 2 support, and a 6-ppm engine, this printer is a capable performer. Generally, it represents hassle-free printing, but it doesn't handle single sheets of paper well. **Jun 94**

★★★ **Smart Label Printer Pro, Seiko Instruments, 408/922-5900, $299.95.** If you need to print only a few labels at a time, this label printer may be an expensive but good choice. It prints very quickly, and with excellent print quality. **May 94**

SCANNERS

★★★★ **Coolscan LS-10e, Nikon Electronic Imaging, 516/547-4200, $2600.** Compact desktop scanner for digitizing images from 35mm transparencies is slow, but delivers images good enough for newsprint publications and some catalogs. **Dec 93**

★★★★ **IX-4015 Color Image Scanner, Canon Computer Systems, 714/438-3000, $1169.** The price of this color flatbed scanner is competitive, and its speed and excellent bundled software make it easy to use and a good choice for the small office. If you can get by without legal-size scans, it should serve you well. **Jul 94**

★★★ **LightningScan Portable, Thunderware, 510/254-6581, $459.** PowerBook owners will find this hand scanner's modem- or serial-port connection, lightweight interface, and total portability well worth the cost, although the scanner is incompatible with some desktop Macs. **Dec 93**

★★★★ **Mirror 800 Plus Color Scanner, Mirror Technologies, 612/830-1549, $999.** Add the NuBus JPEG board ($300) and easy-to-use 35mm transparency scanning module ($599) and you get a nifty—if slow—desktop scanning package for a reasonable price. **Jan 94**

★★★ **ScanMaker 35t, Microtek, 310/297-5000, $1999.** Speedy 35mm film scanner accommodates loose film and delivers a good image, but the included software is weak. **Dec 93**

SYSTEMS/STORAGE

★★★★ **Alacrity PM 6100, KS Labs, 614/374-5665, $165.** Installing a clock booster is the quickest, easiest, and cheapest way to extract more power from Apple's

continues

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Introducing the ScanMaker® III, the first 36-bit, single-pass, color flatbed scanner that's also the best value in the cosmos.

The ScanMaker III's 36-bit color scanning capability allows it to capture an astronomical 68 billion colors. It has an optical density that reaches 3.4, unprecedented for a flatbed scanner, which results in a vastly expanded dynamic range. What all this means is, that your scanned images will have smoother color gradations, denser color values and substantially increased detail in shadow and highlight areas.

Performing like scanners priced somewhere in the stratosphere, the ScanMaker III's scans are so sharp, you will actually reduce the amount of time spent in post-scanning software to sharpen images. And its optical resolution of 600 x 1200 dpi (enhanced through software to 2400 x 2400 dpi) is great for enlarging small originals.

ScanMaker III shown with optional Transparent Media Adapter for scanning transparencies up to 8" x 10".

For accurate scanned color, DCR™ (Dynamic Color Rendition), Microtek's award-winning color calibration/correction system calibrates the ScanMaker III to a photographic industry-accepted calibration target creating a custom profile of your specific scanner. This ensures the most accurate color possible as you scan an image, so you spend a lot less time adjusting the color of your scans to match your originals.

Windows users also get Microtek's ScanWizard™, a drag and drop application for instant image management, faxing and printing. The ScanMaker III also includes the full-version of Adobe Photoshop for complete image editing and color separations.

See why Microtek is the universally accepted leader in image quality. For more information about the ScanMaker III, DCR, ScanWizard, or for the name of your nearest authorized Microtek reseller, call **1-800-654-4160**.

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Circle 287 on reader service card

Star Ratings

entry-level Power Mac. Oct 94

★★★ **Conley SR2 RAID System, Conley Corp., 212/682-0162, $25,335.** While RAID technology is typically praised for its fault-tolerance rather than its speed, this high-performance storage system proves that you can have both. For critical tasks requiring redundancy and round-the-clock operation, this is one of the best Mac RAID systems shipping. Sep 94

★★★ **EtherDock, E-Machines, 408/541-6100, $699.** Heavy-duty Duo docking option is equipped with a full set of 11 ports, including an Ethernet port. The locking mechanism is alarmingly wobbly—although reliable enough to ensure a good connection. May 94

★★★ **Expert Pad PI-7000, Sharp Electronics Corp., 800/237-4277, $899.** Personal digital assistant features the advantages of the Newton, in a better industrial design and at a comparative price. If the battery lasted longer and the message network were implemented, the PDA revolution could begin. Feb 94

★★ **HP Optical Disk Library 10LC, Hewlett-Packard, 800/752-0900, $9495.** Optical jukebox may fill the need for 10 gigabytes of online storage, but its performance is poor, and the software lacks the features needed for adequate management. Jan 94

★★★★ **LC 575, Apple Computer, 408/996-1010, $1699.** For students and small-business professionals who want high power and the convenience of having everything integrated into one case, this 33MHz 68040 system is an ideal choice. Jun 94

★★★ **Newton MessagePad 110, Apple Computer, 408/996-1010, $599.** This is the personal digital assistant that Apple should have shipped in August 1993, with improved handwriting recognition, including deferred and letter-by-letter recognition. It also has more memory, longer battery life, and a more efficient design. Aug 94

★ **NuTek Duet, NuTek USA Corp., 408/973-8799, $2996.** Mac workalike is both a PC and a Mac in a single box, but because of many incompatibilities and problems, the Duet is not a computer anyone should consider using for serious work. Feb 94

★★★★ **OrangePC Model 200 Series, Orange Micro, 714/779-2772, $1139 to $3237.** If your goal is to get a Mac that runs Windows as fast as a PC, you can't get there from here. If your goal is to get business-level performance for day-in, day-out use, these PC coprocessor cards are probably your best choice. Aug 94

★★★★ **PLI Infinity 270 Turbo, PLI, 510/657-2211, $651.** This 270MB SyQuest drive is fast, reliable, and a very good product. The cost of the medium is competitive with that of optical drives. Sep 94

★★★★ **PowerBook 140 F/25 Upgrade, Digital Eclipse Software, 510/547-6101, $399.** By changing the oscillators and adding an FPU, Digital Eclipse changes PowerBook 140s into 170s, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. Dec 93

★★★ **PowerBook 540c, Apple Computer, 408/996-1010, $4839.** The prestige PowerBook du jour, this sleek, curvy and futuristic-looking notebook makes a good computer for both on-the-road and in-the-office use. Its nonstandard battery, memory, and Ethernet ports are not ideal features, however. Oct 94

★★★★ **PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 $3099.** Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. The lack of a floppy drive can be inconvenient, though. Feb 94

★★★★ **PowerBook Duo 280c, Apple Computer, 408/996-1010, $3759.** If you travel a lot, this notebook computer is hands down the best Mac to get. It offers close to the power of a Quadra 650 in a subnotebook. Oct 94

★★ **PowerBook Duo Dock II, Apple Computer, 408/996-1010, $969.** Apple has added Ethernet to this full-featured docking station, but installing NuBus cards is still absurdly difficult. If you don't need NuBus expansion, consider other options. Oct 94

★★★★ **Power Macintosh 6100/60, Apple Computer, 408/996-1010, base model $1819.** Given its price and performance, this Power Macintosh is hard to resist. When developers offer in PowerPC format the software that most business users run daily, this should be a system that will give you power to spare. Jun 94

★★★★★ **Power Macintosh 7100/66, Apple Computer, 408/996-1010, $2899.** Midrange Power Mac makes an outstanding workstation whose power should last for several years. The price is nothing to take lightly, but this system delivers every dollar's worth. Aug 94

★★★★ **Power Macintosh 8100/80, Apple Computer, 408/996-1010, $4249.** While this system doesn't quite offer the excellent price/performance ratio of the other available Power Macs, you should consider it if you're a high-end user moving your work over to RISC-based computing. Aug 94

★★★ **Power Macintosh Upgrade Card, Apple Computer, 408/996-1010, $699.** Current 33MHz 040 machines will get the best bang for the buck with this card, which is a less expensive upgrade path than a standard motherboard replacement. However, other Macs won't realize as much of a performance gain. Oct 94

★★★★ **Quadra 605, Apple Computer, 408/996-1010, 4/80 $979.** Never before has Apple offered so much performance for so little money. The performance and price of this 040-based machine match those of a standard entry-level 486SX-based Windows PC. Mar 94

★★★★ **Quadra 840AV, Apple Computer, 408/996-1010, 8/230 $4069.** Technological tour de force uses a 40MHz 68040 and an AT&T 3210 digital signal processor, and is brimming with sophisticated speech-recognition and audiovisual technology. Beware of some hardware and software incompatibilities. Dec 93

★★★ **SCSI MicroDock, Newer Technology, 316/685-4904, $175.** Tiny Duo docking station is just under 4½ ounces and barely 5 inches long. It adds only an ADB port and a SCSI port—but both are useful. May 94

★★★★ **SledgeHammer2000FMF, FWB, 415/474-8055, $3179.** RAID drive is both fast and inexpensive. Although it can be a bit noisy when accessing data, it's a good deal. Apr 94

★★★ **Turbo 040, DayStar Digital, 404/967-2077, $1899.** This accelerator card is equipped with the fastest 68040 chip available and is as fast as or faster than any Macintosh in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. Dec 93

VIDEO/DISPLAY

★★★ **Apple Macintosh Display Card 24AC, Apple Computer, 408/996-1010, $1579.** 24-bit accelerated graphics card offers a satisfactory price/performance ratio, although it can't switch resolutions from the keyboard. Oct 94

★★★ **Apple QuickTake 100 for Macintosh, Apple Computer, 408/996-1010, $749.** If you're in the market for a medium-quality, digital color camera that costs less than $1000, this is the best deal around. But if you're not in a hurry, you may want to wait until some of the camera's more obvious problems, such as its fixed-focus lens and lack of a zoom option, are ironed out. Jul 94

★★★ **AudioVision 14 Display, Apple Computer, 408/996-1010, $769.** Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. Dec 93

★★★ **Editing Aces Suite, RasterOps, 801/785-5750, $3899.** Video professionals can record and play back full-screen movies in 24-bit color with 16-bit CD-quality sound with these products. Despite flaws, this package represents a step forward in QuickTime technology. Nov 93

★★★ **Intellicolor Display/20, Radius, 408/434-1010, $2399.** Although with its exceptional brightness and clarity this monitor would be a fine addition to any designer's desk, the included Intellicolor software, which lets you control the settings of your display, doesn't offer much added value. Apr 94

★★★ **L-TV Portable, Focus Enhancements, 617/938-8088, $299.** Sturdy, inexpensive, external TV-converter plugs into your Mac and converts video output to NTSC. It provided a crisp, clean image, but mild flickering and conspicuous shimmers were persistent. Aug 94

★★★ **L-TV Pro NuBus, Focus Enhancements, 617/938-8088, $399.99.** NuBus card converts your Mac's RGB video signal to NTSC so you can use your Mac with a TV or VCR. It supports a wide range of Macs, but the image has some flicker and distortion, despite flicker-filtering software. Aug 94

★★★★ **MovieMovie, Sigma Designs, 510/770-0100, $349.** This 7-inch NuBus video-capture board may be what you've been waiting for. The price is right, and the addition of on-board audio input is a plus, even if it is only mono. Dec 93

★★★ **The Presenter Plus Mac/PC, Consumer Technology Northwest, 503/643-1662, $429.** Small, external TV-converter supports output to television from most Macs with built-in video. It does a barely passable job of providing a stable image. Aug 94

★★★ **QA-350 LCD, Sharp Electronics Corp., 800/237-4277, $2495.** At less than half the cost of a typical active matrix LCD panel, this passive matrix projection panel offers an economical alternative for presenters who don't need multimedia capability. Jul 94

★★★★ **Radius LeMansGT, Radius, 408/434-1010, $2499.** Fast, 24-bit accelerated graphics card has automatic 30-bit CLUT calibration and can switch resolution on the fly via a pop-up menu. Oct 94

★★ **RasterOps Horizon 24, RasterOps, 408/562-4200, $1999.** This 13-inch 24-bit accelerated graphics card is slower than anticipated and overpriced. The ROM can, however, be upgraded via software. Oct 94

★★★ **Simply TV, E-Machines, 408/541-6100, $439.** Easy-to-install video card plugs snugly into a PDS slot, and allows you to use your Mac with a television for display. The image is impressively flicker-free, but the resolution is limited to 256 colors. Aug 94

★★★★ **SuperMac Spectrum Power•1152, SuperMac, 408/541-6100, $1399.** Fast, relatively inexpensive, 24-bit accelerated graphics card can switch resolutions from the keyboard and offers zoom and pan options. Oct 94

★★ **Tornado Graphics Card, Mirror Technologies, 612/832-5622, $699.** Inexpensive 24-bit accelerated graphics card has zoom and pan options but is relatively slow. Oct 94 m

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MACWORLD MW EDITORS' CHOICE

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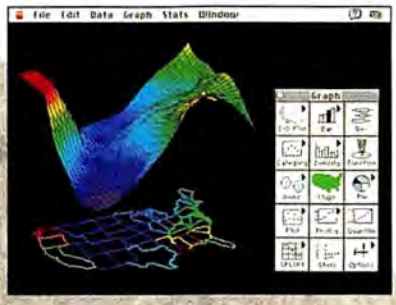

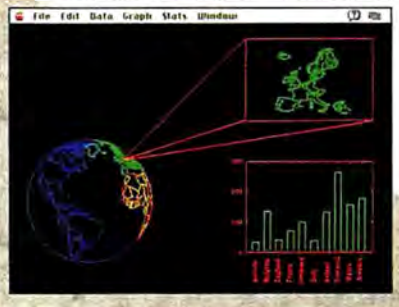

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Free output sample, 800/835-6100, Ext. 10

Circle 143 on reader service card

Streetwise Shopper

SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

Selected and edited by Charles Barrett

The following listings include both time-sensitive promotions and open-ended offers being sponsored by Macintosh vendors and their resellers. Each listing indicates which products have been awarded a star rating in *Macworld*'s *Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an Editors' Choice, or have won a World-Class award. In some cases, the editorial evaluation quoted is for an earlier product version. The ◁ symbol indicates that the product is Power Mac related.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld*, 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

BUNDLES

◁ **Canvas 3.5 + Clip Art + TrueType Fonts** Deneba Software is including 10,000 clip art images cataloged in an Image Browser graphics database and a cross-platform collection of 2000 text, display, and novelty TrueType fonts on CD-ROM with all versions of its $399 Canvas draw program (Jan 94 ★★★ for the 680X0 version). Call 305/596-5644 for more information.

Créarts/Texas + Créarts Potpourri Clip Art Aktulun Design is offering its $59 Texas collection of 44 EPS images plus its $39 Potpourri collection of 60 EPS images for $69. Call 512/447-6522 to order or to obtain a free interactive demo disk. *Offer expires 10/30/94.*

DynaMO 230 + Macromedia Director 4.0 Fujitsu Computer Products is bundling Macromedia's $1195 multimedia/animation program (Sep 94 ★★★★) with its $1295 DynaMO magneto-optical external drive (includes optical disk stand, power supply, software drivers and formatter, and 25-pin SCSI cable). Available through Rocky Mountain Computer Outfitters, 800/908-0009.

FileMaker Pro 2.1 + PowerAgent 1.1 SouthBeach Software is offering its $159 PowerAgent for accessing and distributing FileMaker Pro data, or running its scripts, for $49 (regularly $89.95). PowerAgent also automates AppleScript and distributes information using PowerTalk and QuickMail. To qualify, the latest version of FileMaker Pro must also be purchased ($269, or upgrade for $89 and sidegrade for $99). Available through MacWarehouse (800/255-6227; ask for #AAP 0012). For more information about PowerAgent call 305/858-8416. *Offer not to expire before 12/31/94.*

Kai's Power Tools 2.1 + Color It 2.0 HSC Software is bundling MicroFrontier's $149.95 Color It image-editing application (Apr 93 ★★★ for version 2.0.1) with the latest version of its $199 Kai's Power Tools collection of plug-in extensions (May 94 ★★★★★ for version 2.0a) for such applications as Adobe Photoshop and Fractal Design. Call 310/392-8441 for more information.

PenMouse Tablet + Dabbler 1.0 Kurta Corporation is including a free copy of Fractal Design Corporation's $99 Dabbler natural-media draw and paint application (Nov 94 ★★★) with its $249 PenMouse cordless pen, 4-by-5-inch drawing tablet, driver software, and accessory package. Call 800/445-8782 for nearest reseller. *Offer expires 12/31/94.*

◁ **PressView 21•T Display System** SuperMac Technology is including a $799 tristimulus SuperMatch Display Calibrator Pro (Nov 94 "Big Screen Close-up" Editors' Choice) with its new $3999 21-inch diagonal-aperture-grill display, which supports a top resolution of 1600 by 1200 when used with SuperMac's Thunder II GX•1600 graphics card. PressView display-control software and a ColorShield antiglare display hood are also included. Call 800/334-3005 for more information.

COMPETITIVE UPGRADES

Apple IP Gateway Apple is offering this $249 AppleTalk software server to owners of Apple Remote Access Personal Server 2.0.1, MultiPort Server 2.0.1, or Apple Internet Router 3.0.1 for $69 with proof of purchase. In combination with Apple Remote Access products and MacTCP, this gateway enables easy-to-use dial-up access to IP-based services such as Internet. Call 408/862-3385 for more information.

Drive7 3.0 Casa Blanca Works is offering this $89.95 drive-formatting and -acceleration program (Nov 94 ★★★★) to owners of any other formatting utility for $40. Call 415/461-2227 for further information.

◁ **First Things First Proactive 1.1** Visionary Software is offering this $149 scheduling program (Nov 94 ★★★) in 680X0 and PowerPC versions to users of competing products for $59 ($39 to current users). Call 800/877-1832 for more information.

◁ **OmniPage Professional 5.0** Caere Corporation is offering this native-mode version of its $695 OCR package (Nov 94 ★★★★; Nov 93 "OCR: The Recognition You Deserve" Editors' Choice for version 2.1) for $199 to users of competitive products (Xerox TextBridge owners can upgrade for $239). Call 800/535-7226 for more information.

SPECIAL DISCOUNTS/REBATES

Day-to-Day Portfolio Software is offering this $149.95 bundle for $89.95 (the Contacts and Calendar modules are available separately for $49.95 each; the Notepad for $29.95). The bundle consists of the following: Day-to-Day Contacts (formerly Dynodex) address-book manager (Sep 94 ★★★ and 1993 World-Class for Dynodex 3.5); Day-to-Day Notepad (formerly DynoNotepad) for creating outlines, to-do lists, and notes; a new Day-to-Day Calendar module; and a leather organizer. Day-to-Day Contacts allows you to view contacts without opening the application, and features a linking button that automatically creates new Notepad files to keep ongoing records of contact information. Call 800/329-8632 to order. *Offer not to expire before 12/31/94.*

◁ **Microsoft Office 4.2** Microsoft Corporation is offering this upgrade of its integrated business-application software for $259 (regular nonupgrade street price is approximately $499) to users of Microsoft Works, Excel, PowerPoint, or Word with the return of a $40 coupon that accompanies the product. Office's applications include Excel 5.0, PowerPoint 4.0, Word 6.0, and a workstation license for Microsoft Mail 3.2. A free copy of Connectix Corporation's $99 RAM Doubler memory-enhancement product will also be included through 3/31/95. A second coupon accompanying the 680X0 version entitles you to a free copy of the Power Mac version prior to 11/1/94, at which time both versions are to ship in the same box. Call 800/622-4445 for rebate information. *Offer expires 12/31/94.*

Note-it; Souvenir ComposeTel is offering a special introductory price of $44 on its $79 Note-it electronic sticky-note program, which allows notes to contain styled text with embedded sounds, PICT images, or QuickTime movies; and $49 on its $89 Souvenir networkable contact manager, which is always available by pressing the ⌘ key twice. Call 800/283-5872 (415/327-0744 if in California) for more information. *Offer expires 10/31/94.*

Now Utilities 5.0 Now Software is offering a special introductory price of $69.95 ($89.95 regular estimated street price) on the new version of this system utility collection (Aug 93 ★★★★ for version 4.0.1). Special multipack prices are also available. Call 800/689-9427 for more information. *Offer not to expire before 10/31/94.*

Signature Series (Professional Stock Photography) Digital Stock is offering an introductory price of $249 per disc (regularly $349) for this series of photo CDs that highlights the best work of noted photographers in distinct subject areas. Released so far are Western Scenics (Mike Sedam), Undersea Textures (Robert Yin), and Food (Joshua Ets-Hokin). Each disc contains 100 royalty-free photos together with a hi-res, color contact sheet. Call 800/545-4514 to order and for more information. *Offer not to expire before 10/15/94.*

Summagraphics Plotters Summagraphics is offering reduced list prices on the following series of pen plotters: HiPlot 7000, D- and E-size multipen DMP-160, and single-pen DMP 60SP. Hi JetPro C-size monochrome ink-jet plotters are also included. The $3595 A- to D-size HiPlot 7100 is $2499, and the $4695 A- to E-size 7200 is $2999. The $2795 DMP-161 is $1799, the $3595 DMP-162 is $2199, and the $5495 162R is $3999. The $1995 DMP-61SP is $1399, and the $2795 DMP-62SP is $1799. The $1795 HI JetPro V50 is $1499, and the $2495 V100 is $1999. Call 512/835-0900 for more information. *Offer expires 10/31/94.* m

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Circle 202 on reader service card

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137	Graphix Zone	—	—
185	Graphsoft	46	410/290-5114
93	Hewlett Packard	11	—
142	HSC Software	5	310/392-8441
30-31	IBM	179	800/1IBM-6676
138	IDG Books	—	800/762-2974
176	Insignia Solutions	68	800/848-7677
143	Intuit/Chipsoft	—	800/964-1040
BC	Kensington Microware Ltd.	—	800/535-4242
15-17	La Cie	52	800/999-1157
45	LaserMaster	102	800/950-6868
151	LaserMaster	103	800/950-6868
187	Logicode Technology	297	800/735-6442
224-225	Mac Bargains	70	800/619-9091
71-73	MacConnection	—	800/800-3333
199-205	MacMall	131	800/222-2808
14	MacTable/ScanCo	—	800/722-6263
216-217	MacWarehouse	150	800/255-6227
128-131	Macworld Expo SF	—	617/361-8000
253	Macworld	—	—
218	MegaHaus	245	800/786-1184
40	MicroNet Technology, Inc.	139	800/800-DISK
CV2-1	Microsoft	—	—
22-23	Microsoft	—	—
102-103	Microsoft	—	—
189	Microtek Lab Inc.	287	800/654-4160
152	Mirror Technologies	58	800/643-4142
170	Mobius Technologies	109	800/800-4334
28	Momentum, Inc.	8	808/263-0088
2-3	NEC Technologies	15	800/NEC-INFO
IBC	NEC Technologies	16	800/NEC-INFO
42	Nisus	123	800/647-8794
111	Now Software	—	800/237-2078
20	Orange Micro Inc.	33	714/779-2772
94-95	Pinnacle Micro	115	800/553-7070
62	Polaroid	295	—
223	Pro Direct	135	800/524-9952
159	Proxima Corporation	47	800/447-7694
254-256	Quality Computers	263	800/777-3612
80	Samsung Electronics	198	800/933-4110
112-113	Scitex	233	800/685-9462
161-162	Signature Software	300	800/925-8840
13	Software Ventures	213	—
183	Statsoft	99	918/583-4149
48	Strata	114	800/869-6855
49	Strata	116	800/869-6855
166	SunStar	246	800/660-4480
219	SuperMicro	126	800/352-3415
50-51	Symantec Corporation	—	—
191	Systat	29	708/864-5670
212	TechWorks	244	800/395-7924
192	Tektronix	143	800/835-6100
180-181	Texas Instruments	266	800/527-3500
227	The Mac Zone	71	800/436-0606
24	Umax Technologies	196	800/769-7848
168	ViewSonic	237	909/869-7976
12	VST Power Systems	73	508/287-4600
120-121	WordPerfect Corporation	—	800/526-7820
29	Xante Corporation	112	800/926-8839
74	Xante Corporation	111	800/926-8839

Macworld Product Index

A quick and easy product index from Macworld. Simply use this index to find the page or advertiser of the products which interest you. Then, use the reader service number for our FastFacts Product Information Card located on the following page.

Page No.	Advertiser	Reader Srvc. No.
SOFTWARE		
BUSINESS		
26	Attain Software	—
134	Charles Schwab	277
56	Delrina Corporation	137
21	Globalink Inc.	223
CV2-1	Microsoft	—
22-23	Microsoft	—
102-103	Microsoft	—
161-162	Signature Software	300
183	Statsoft	99
191	Systat	29
120-121	WordPerfect Corporation	—
CAD/CAM		
12	Engineered Software	12
185	Graphsoft	46
CD ROM		
175	Corel Corporation	78
257	Educorp	157
COMMUNICATION		
60	DataViz	79
56	Delrina Corporation	137
13	Software Ventures	213
EDUCATION		
165	Adam Software Inc.	22
213	Educational Resources	210
254-256	Quality Computers	263
FONTS		
161-162	Signature Software	300
GRAPHICS/DTP		
78	Agfa	90
58	Claris Corporation	—
175	Corel Corporation	78
9	Fractal Design	190
14	Fusion Digital Media	274
142	HSC Software	5
112-113	Scitex	233
48	Strata	114
49	Strata	116
MULTIMEDIA		
165	Adam Software Inc.	22
14	Fusion Digital Media	274
PERSONAL		
143	Intuit/Chipsoft	—
POWERBOOK		
44	Connectix	189
50-51	Symantec Corporation	—
STATISTICAL		
183	Statsoft	99
191	Systat	29
UTILITIES		
164	Connectix	192
44	Connectix	189
47	Dantz Development	26
8	GDT Softworks	32/42
176	Insignia Solutions	68
111	Now Software	—
50-51	Symantec Corporation	—
WORD PROCESSING		
42	Nisus	123
120-121	WordPerfect Corporation	—
HARDWARE		
BOARDS		
170	Mobius Technologies	109
20	Orange Micro Inc.	33
212	TechWorks	244
CD ROM		
257	Educorp	157
219	SuperMicro	126
COMPUTER SYSTEMS		
76	Apple Computer	—
226	CRA Systems Inc.	20
208-209	Express Direct	81
DIGITIZERS/SCANNERS		
68	Agfa	158
141	Agfa	43
214	Digital Axis	83
6-7	Epson America	—
194	Fujitsu	202
189	Microtek Lab Inc.	287
152	Mirror Technologies	58
62	Polaroid	295
112-113	Scitex	233
24	Umax Technologies	196
DISPLAY		
226	CRA Systems Inc.	20
66	CTX International	38
214	Digital Axis	83
152	Mirror Technologies	58
2-3	NEC Technologies	15
IBC	NEC Technologies	16
159	Proxima Corporation	47
80	Samsung Electronics America, Inc.	198
168	ViewSonic	237
EXPANSIONS/UPGRADES		
212	TechWorks	244
FURNITURE		
28	Agio	—
HARD DISKS/STORAGE		
210-211	Alliance Peripheral Systems	62
220-221	BottomLine Distribution	63
222	BottomLine Distribution	65
206-207	ClubMac	96
215	Direct Connections	121
15-17	La Cie	52
218	MegaHaus	245
40	MicroNet Technology, Inc.	139
94-95	Pinnacle Micro	115
223	Pro Direct	135
219	SuperMicro	126
INPUT DEVICES		
BC	Kensington Microware Ltd.	—
MISCELLANEOUS		
28	Momentum, Inc.	8
MODEMS		
187	Logicode Technology	297
NETWORKING		
146-147	Dayna Communications	161
30-31	IBM	179
POWERBOOK		
12	VST Power Systems	73
PRINTERS		
64	Fargo Electronics	172
8	GDT Softworks	32/42
93	Hewlett Packard	11
45	LaserMaster	102
151	LaserMaster	103
112-113	Scitex	233
192	Tektronix	143
180-181	Texas Instruments	266
29	Xante Corporation	112
74	Xante Corporation	111
VIDEO		
46	Connectix	191
SERVICES		
FINANCIAL		
155-156	Citibank	—
ACCESSORIES		
FURNITURE		
10	Anthro	—
14	MacTable/ScanCo	—
MISCELLANEOUS		
11	Apple Computer	—
14	MacTable/ScanCo	—
ON LINE		
171-172	America OnLine	—
101	CompuServe	66
32	Delphi	173
TRADESHOWS/CONFERENCES		
128-131	Macworld Expo SF	—
MAIL ORDER		
210-211	Alliance Peripheral Systems	62
220-221	BottomLine Distribution	63
222	BottomLine Distribution	65
206-207	ClubMac	96
83-85	Computer Discount Warehouse	2
215	Direct Connections	121
213	Educational Resources	210
208-209	Express Direct	81
224-225	Mac Bargains	70
71-73	MacConnection	—
199-205	MacMall	131
216-217	MacWarehouse	150
218	MegaHaus	245
223	Pro Direct	135
254-256	Quality Computers	263
227	The Mac Zone	71

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Please answer these questions so that we may better serve you.

A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)
- 01 ❑ 1000+
- 02 ❑ 999 - 100
- 03 ❑ 99 - 25
- 04 ❑ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)
- 05 ❑ Apple Workgroup Servers/ Mac Quadra-series
- 06 ❑ Mac Centris-series/II-series/LC III/ Performa 600/450/SE 30
- 07 ❑ Mac LC/LC II/Performa 430/405/ 400/200/Classic-series/SE/Plus/ 512K/128K/Portable
- 08 ❑ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/ or services? (Check one.)

	C	D
500+	❑ 09	❑ 15
499 - 100	❑ 10	❑ 16
99 - 50	❑ 11	❑ 17
49 - 10	❑ 12	❑ 18
9 - 1	❑ 13	❑ 19
None	❑ 14	❑ 20

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)
- 21 ❑ Initiate/Determine need for product/capabilities/features
- 22 ❑ Evaluate, recommend, or approve brands/models
- 23 ❑ Evaluate, recommend, or approve purchase source
- 24 ❑ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)
- 25 ❑ $1 million or more
- 26 ❑ $999,999 – $500,000
- 27 ❑ $499,999 – $100,000
- 28 ❑ $99,999 – $50,000
- 29 ❑ $49,999 – $10,000
- 30 ❑ Under $10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)
- 31 ❑ Business software (Word processing, spreadsheet, database, etc.)
- 32 ❑ Graphics/publishing software
- 33 ❑ Monitors/displays
- 34 ❑ Printers/scanners
- 35 ❑ Networking/communications hardware and/or software
- 36 ❑ Multimedia/AV hardware and/or software
- 37 ❑ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)
- 38 ❑ Computer Reseller/VAR/VAD
- 39 ❑ MIS/DP/IS/Network Management
- 40 ❑ Engineering
- 41 ❑ R&D/Scientific
- 42 ❑ Corporate/General Management
- 43 ❑ Accounting/Finance
- 44 ❑ Marketing/Sales/PR/ Communications
- 45 ❑ Art/Design/Creative Services

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1	2	3	4	5	151	152	153	154	155
6	7	8	9	10	156	157	158	159	160
11	12	13	14	15	161	162	163	164	165
16	17	18	19	20	166	167	168	169	170
21	22	23	24	25	171	172	173	174	175
26	27	28	29	30	176	177	178	179	180
31	32	33	34	35	181	182	183	184	185
36	37	38	39	40	186	187	188	189	190
41	42	43	44	45	191	192	193	194	195
46	47	48	49	50	196	197	198	199	200
51	52	53	54	55	201	202	203	204	205
56	57	58	59	60	206	207	208	209	210
61	62	63	64	65	211	212	213	214	215
66	67	68	69	70	216	217	218	219	220
71	72	73	74	75	221	222	223	224	225
76	77	78	79	80	226	227	228	229	230
81	82	83	84	85	231	232	233	234	235
86	87	88	89	90	236	237	238	239	240
91	92	93	94	95	241	242	243	244	245
96	97	98	99	100	246	247	248	249	250
101	102	103	104	105	251	252	253	254	255
106	107	108	109	110	256	257	258	259	260
111	112	113	114	115	261	262	263	264	265
116	117	118	119	120	266	267	268	269	270
121	122	123	124	125	271	272	273	274	275
126	127	128	129	130	276	277	278	279	280
131	132	133	134	135	281	282	283	284	285
136	137	138	139	140	286	287	288	289	290
141	142	143	144	145	291	292	293	294	295
146	147	148	149	150	296	297	298	299	300

Free Macworld Shopper Information

401	402	403	404	405	501	502	503	504	505
406	407	408	409	410	506	507	508	509	510
411	412	413	414	415	511	512	513	514	515
416	417	418	419	420	516	517	518	519	520
421	422	423	424	425	521	522	523	524	525
426	427	428	429	430	526	527	528	529	530
431	432	433	434	435	531	532	533	534	535
436	437	438	439	440	536	537	538	539	540
441	442	443	444	445	541	542	543	544	545
446	447	448	449	450	546	547	548	549	550
451	452	453	454	455	551	552	553	554	555
456	457	458	459	460	556	557	558	559	560
461	462	463	464	465	561	562	563	564	565
466	467	468	469	470	566	567	568	569	570
471	472	473	474	475	571	572	573	574	575
476	477	478	479	480	576	577	578	579	580
481	482	483	484	485	581	582	583	584	585
486	487	488	489	490	586	587	588	589	590
491	492	493	494	495	591	592	593	594	595
496	497	498	499	500	596	597	598	599	600

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RELISYS

AVEC 2400

Color Scanner

The Avec Color 2400 Mac is a scanner which maximizes the desktop personal computer into a working imaging tool. It is a three pass design, capable of scanning a 8 1/2"x14" area in 24-bit, 16.8 million colors with a maximum resolution of 2400 dpi. This translates into 180,000 pixels per square inch, a true benefit for image scanning. Bundled with Adobe Photoshop LE and OmniPage Direct OCR software, the Avec 2400 has everything you need in an entry level color scanner with three times the specifications of the competition at a lower cost. SCSI-2 interface.

65711 $588.99

RELI 2412

Color Scanner

The Reli 2412 Mac is an excellent choice for the desktop publisher. It is of a single pass design, capable of scanning a 24-bit 8 1/2" x 14" 16.8 million color image with a maximum resolution of 2400 dpi. The Reli 2412's maximum optical resolution translates into 360,000 pixels per square inch, which benefits anyone scanning color images and transparencies. Bundled with Adobe Photoshop LE image processing and OmniPage Direct OCR software.

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ALASKA AS SOFTWARE

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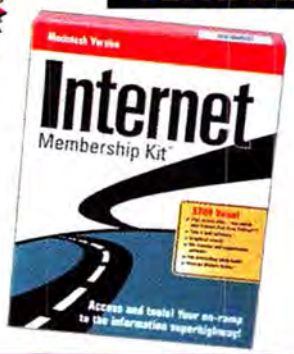

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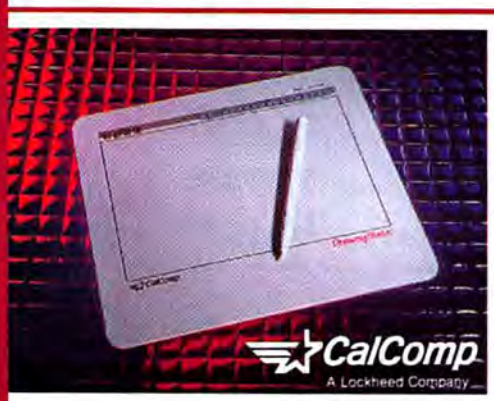

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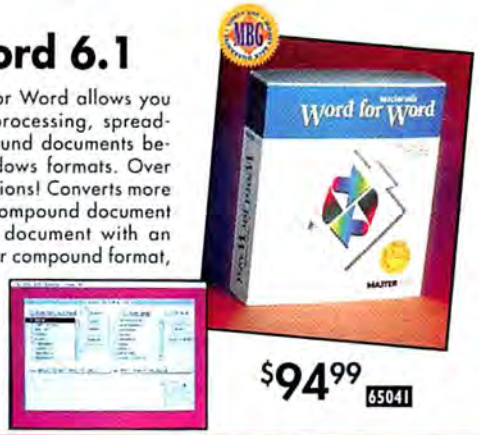

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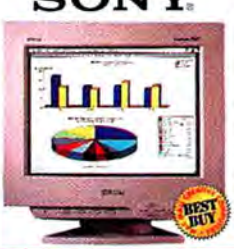

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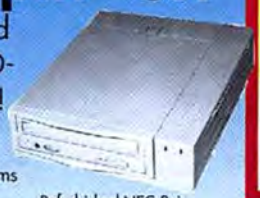
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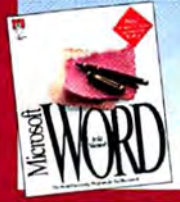
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1.7GB	ST11950N	*Barracuda 1*	8ms	1350mb	$1379	$1439
2.1GB	ST12550N	*Barracuda 2*	8ms	2050mb	$1389	$1449
4.3GB	ST115150N	*Barracuda 4*	8.5ms	4000mb	$2479	$2539
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CD-ROMs

NEC MultiSpin 3Xp

The 3Xp combines 3X transfer rate performance, 250ms access time and a 256 KB continuous-flow cache in a compact design, making it and incredible value. At only 2.4 lbs the 3Xp is the world's lightest triple speed CD-ROM reader.

MultiSpin CD-ROM READER | MPC2 Multimedia PC | PhotoCD

NEC

MultiSpin 3Xp CD-ROM Reader

CD-ROM READERS

	w/o bundle	w/ClubMac CD bundle
MultiSpin 3Xp (Portable, 250ms access time, very light; 2.4 lbs)	$385	$485
MultiSpin 3Xi (Internal, 195ms access time, 450KB/sec data transfer)	$429	$529
MultiSpin 3Xe (External, 195ms access time, 450KB/sec data transfer)	$469	$569
MultiSpin 4X Pro (External, 180ms access time, 600KB/sec data transfer)	$699	$799

NEC MultiSpin CD-ROM Readers carry a TWO Year Warranty

ClubMac Removable Drives

FEATURING SyQuest REMOVABLE TECHNOLOGY

ClubMac 30 DAY MONEY BACK GUARANTEE

CLUBMAC 3.5" REMOVABLES | CLUBMAC 5.25" REMOVABLES

CLUBMAC REMOVABLES

	Internal	External
ClubMac 44mb 5.25" (SQ555)	$199	$229
ClubMac 88c 5.25" (SQ5110C)	$328	$368
ClubMac 200mb 5.25" (SQ5200)	$448	$488
ClubMac 105mb 3.5" (SQ3105)	$259	$299
ClubMac 270mb 3.5" (SQ3270)	$459	$499

CARTRIDGES

44mb (SQ400)	$57
88mb (SQ800)	$69
200mb (SQ2000)	$79
105mb (SQ310)	$57
270mb (SQ327)	$65

All drives include SCSI Director formatting software, ONE FREE Cartridge, necessary cables for "plug-and-play" and documentation.
All SyQuest drives include a TWO Year Warranty. All SyQuest cartridges include a FIVE Year Warranty.

ClubMac Optical Drives

INTRODUCING THE NEW CLUBMAC 230MB OLYMPUS OPTICAL DRIVE

- 28ms Average Seek Time
- MTBF: 50,000 hours
- SCSI-2 Interface
- Includes a FREE formatted optical disk
- TWO Year Warranty

ClubMac 30 DAY MONEY BACK GUARANTEE

	Access Time	Internal	External
ClubMac (MOS-320E) 3.5" 230MB Olympus Optical NEW	28ms	$865	$895
Fujitsu (M2512A-DYNAMO) 3.5" 230MB Dynamo	30ms		$929
ClubMac (JY-750) 5.25" 650MB Sharp Optical MW	40ms	$1669	$1699
ClubMac (JY-800) 5.25" 1.3GB Sharp Optical	40ms	$2069	$2099
MaxOptix Tahiti III (9400) 5.25" 1.3GB Optical	19ms		$2499
Hewlett-Packard (C1716T) 5.25" 1.3GB Optical External	28ms		$2399

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

ClubMac Tape Backups

ClubMac 2.0GB DDS DAT Drive

- 20 second average data access time (based on 60m tape)
- Up to 266 KB/sec data transfer rate
- SCSI-1/SCSI-2 Interface • MTBF of 60,000 hours

ClubMac 30 DAY MONEY BACK GUARANTEE

Capacity	Model	Format	Media	Internal	External
2.0GB	ClubMac DAT	DDS	60m, 90m	$739	$789
2-4GB	ClubMac DAT/DC	DDS-DC	60m, 90m	$929	$979
4-8GB	ClubMac DAT/2	DDS-2	60m, 90m, 120m	$1139	$1189
2-4GB	EXB-8205S	8mm	112m	$1499	$1549
5-10GB	EXB-8505S	8mm	112m	$2315	$2365

ClubMac DAT and DAT/DC drives include Retrospect v2.1 Backup Software, ONE 90 Meter Tape and a TWO Year Warranty. Exabyte Tape Backup drives carry a ONE Year Warranty. The ClubMac DAT/2 drive includes Retrospect Remote v2.0 (3-Pack) Network Backup Software, ONE 120 Meter Tape and a ONE Year Warranty

CD-ROMs

ClubMac 2X Speed CD-ROM Reader

- 320ms access time • Caddy-Less design
- Double Speed performance
- Headphone jack and RCA jacks
- PhotoCD compliant

$199

ClubMac 30 DAY MONEY BACK GUARANTEE

	w/o bundle	w/ClubMac CD bundle
ClubMac Dual-Speed (External, 320ms access time)	$199	$299
ClubMac Quad-Speed (External, 150ms access time) NEW	$599	$699

The ClubMac CD ROM readers carry a ONE Year Warranty

ClubMac CD Bundle $800 VALUE

The Animals | Atlas Pack (World) | Atlas Pack (US) | Maya Clinic | Toolworks Encyclopedia v6.0 | Space Shuttle | Quickshot Speakers

MacWorld November 1994

radius

Monitors, Graphic Cards & MultiMedia

SUPERMAC™

E-Machines T16 II

The T16 II delivers 70% more display area, providing you with the elbow room for full-page layouts or working with several applications in multiple windows at the same time. Its multiple resolutions range from 640 x 480 to 1024 x 768. Automatically syncs to most popular Macintosh timings; plus it works with on-board graphics on the Quadra and Centris.

While supplies last!!

VideoVision Studio

With JPEG hardware compression and decompression for full-screen, full motion recording and playback from a hard disk, VideoVision Studio combines the power and flexibility of the Macintosh with the ease and transportability of video tape.

DigitalFilm Deluxe

Real-time capture of 60 fields/sec, full-motion video and audio to disk, supports 30 frames/sec with video capture up to 640 x 240, hardware JPEG compression, includes MacroMedia Director.

Incredible price!

LeMansGT

Delivering 24-bit color at resolutions up to 1152 x 870, Radius' high-octane LeMansGT delivers the best on-screen performance of any interface in its class. The LeMansGT features a 7" board, instantaneous resolution switching, on-board acceleration, razor-sharp photorealistic color, and Adobe Photoshop Acceleration.

Thunder II GX• 1152

Thunder II GX•1152's 1152 x 870 resolution is great for viewing a full two-page spread without scrolling. A cost-effective solution with all the power of CMYK acceleration, image-processing acceleration, image-processing acceleration, and QuickDraw acceleration. It is also Power Macintosh compatible.

MONITORS

PrecisionColor Display/21 (0463)	$1969
IntelliColor Display/20e (0461)	$1875
PrecisionColor Display/20v (0427)	$1379
PrecisionColor Display/17 (0460)	$959 *
Pivot Display (0361)	$549
Full Page Display/gs (0424)	$479
FPD20gs (0436)/21gs (0437)	$785/$969
SuperMatch 21•T XL Trinitron (STD2102)	$2099
SuperMatch 20•T XL Trinitron (STD9752-XL)	$1949
SuperMatch 17XL (STD1701)	$869
Matinum 21 Two-Page GS (STD9761)	$999
PressView 21 •T (PV2101)	$3199
E-Machines T16 II (PV2101)	$799

*After MFR $100.00 rebate. Offer expires 09/30/94

MULTIMEDIA SOLUTIONS

VideoVision Studio Pro Pak (0418)	$8299
VideoVision Studio (0418)	$3295
VideoVision Studio Upgrade (0419)	$1499
VideoVision Studio Basic (0416)	$1509
DigitalFilm Deluxe (DV2050)	$1699
Spigot II Tape (DV1530)	$835
Video Spigot NuBus (DV1030)	$359
Video Spigot NuBus LC (DV1050)	$235

GRAPHIC CARDS

LeMansGT (0447)	$1835
PrecisionColor Pro 24X (0429)	$1319
PrecisionColor Pro 24XK (0430)	$749
PrecisionColor Pro 24XP (0431)	$439
PrecisionColor 24X (0421)	$929
PrecisionColor 8XJ (0369)	$439
Thunder II GX•1600 1600 x 1200 CMYK acceleration	$3199
Thunder II GX•1360 1360 x 1024 CMYK acceleration	$2579
Thunder II GX•1152 1152 x 870 CMYK acceleration	$2169
Thunder/24 v3.0 (G1130)	$1399
Spectrum Power • 1152 (G3430)	$1169
Spectrum/24 Series V (G7930)	$829

NEC

21" MultiSync 6FGp

MONITORS

14" MultiSync 2V (JC-1432VMA) up to 832 x 624	$310*
15" MultiSync 3V (JC-1535VMA) up to 1024 x 768	$429**
15" MultiSync 4FGe (JC-1531VMA-3) up to 1024 x 768	$629
17" MultiSync 5FGe (JC-1731VMA-3) up to 1024 x 768	$989
17" MultiSync 5FGp (JC-1741UMA-3) up to 1280 x 1024	$1099
21" MultiSync 6FGp (JC-2141UMA-3) up to 1280 x 1024	$1999

NEC Monitors carry a THREE Year Warranty.
*After MFR $25.00 rebate. **After MFR $40.00 rebate. Offers end 09/30/94

PRINTERS

Silentwriter 640 6ppm, 300 dpi, 52 fonts, PS Level 2	$679*
Silentwriter 1097 10ppm, 600 dpi, 35 fonts PS Level 2	$1379

The Silentwriter 640 carries a Limited TWO-Year Overnight Replacement Warranty
The Silentwriter 1097 carries a ONE Year Warranty.
*After MFR $50.00 rebate. Offer ends 09/30/94

Printers

IP LaserJet 4MP Printer

True 600 x 600 dpi
PostScript Level 2
with 35 scalable fonts
6 MB RAM, expandable to 22MB

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HP DeskWriter Inkjet Printers carry a THREE Year Warranty.
HP DeskWriter 310 Printers carry a ONE Year Warranty.
HP LaserJet Printers carry a ONE Year Warranty.

HP DeskWriter 310 Printer 300 x 300 dpi, 3ppm, Optional Color Kit Available	$309
HP DeskWriter 310 Printer with Cutsheet Feeder (60-sheet) Color Kit Available	$369
HP DeskWriter 520 Inkjet Printer 600 x 300 dpi, 3ppm, 35 fonts	$289
HP DeskWriter 560C Inkjet Printer 600 x 300 dpi color, 3ppm, 35 fonts	$575
HP DeskJet 1200C/PS PostScript Printer 600 x 300 dpi, 6ppm	$2215
HP LaserJet 4ML Printer 300 x 300 dpi, 4ppm, 35 scalable fonts	$1029
HP LaserJet 4MP Printer 600 x 600 dpi, 4ppm, 35 scalable fonts	$1395

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ScanMaker IIHR with full version of Photoshop	$1079

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- Optical resolution: 600 x 1200 dpi
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- 30-bit internal, 24-bit external
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ES-1200C Pro-MAC Up to 4800dpi, Full version of PhotoShop, ScanTastic, Kai's PowerTools	$1299
ES-800C LE Up to 1600dpi, PhotoShop LE, ScanTastic	$899
ActionScanning-Mac Up to 1200dpi, PhotoShop LE & ScanTastic	$699*
Transparency Unit (8813021)	$749

*After MFR $100 rebate, offer ends 12/31/94

Modems

SupraFAXModem 28.8 MC

SUPRA MODEMS

SupraFAXModem 14.4 LC V.32bis, V.42bis, FAXcilitate	$139
SupraFAXModem 14.4 MC V.32bis, V.42bis, FAXcilitate	$199
SupraFAXModem 14.4 PB V.32bis, V.42, FAXcilitate	$219
SupraFAXModem 28.8 MC V.Fast Class w/FAXcilitate	$279
SupraFAXModem 28.8 PB V.Fast Class, FAXcilitate	$319

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DUO & PB500 Series Mercury now in stock!

TelePort Mercury

GLOBAL VILLAGE MODEMS

PowerPort / TelePort

Mercury 19,200, V.32 Turbo	$319/$279
Gold 14,400 V.32bis	$239/$225
Bronze/Bronze II 2400, 4800, 9600 Fax	$89/$89
OneWorld Fax Server 1 Line/AppleTalk	$839
OneWorld Fax Server 2 Line/10BT	$1259

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Turbo 040 (with FPU support)	
33 MHz Turbo 040 w/128K cache (000773)	$789
50 MHz Turbo 040 w/128K cache (000797)	$955
Turbo 040i (w/o FPU support)	
33 MHz Turbo 040i w/128K cache (000780)	$625
FastCache Turbo (000223)	$165

APPLICATION ACCELERATORS

Passage 040 (Quadra/Centris) (000414)	$1539
Road 040 w/128K cache (Quadra/Centris) (000056)	$955

POWERPC PRODUCTS

66 MHz PowerPro 601 (000728)	$1315
80 MHz PowerPro 601 (000735)	$1997
FastCache PowerPro-1MB Cache (000742)	$499
66 MHz w/1MB Cache Bundle (000858)	$1689
80 MHz w/1MB Cache Bundle (000865)	$2425

POWERCACHE

	without FPU / with FPU
33 MHz PowerCache (P31UV-033)	$275 / $357
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PowerCache Adapter*	$99

* Not req'd for IIci, IIvi, IIvx, Performa 600

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WACOM UD Graphic Tablet

WACOM PRODUCTS

ARTZ 6x8 ADB Tablet	$299
UD 12x12 Standard Tablet	$499
UD 12x18 Electrostatic Tablet	$809
UD 12x18 Standard Tablet	$699
UD 18x25 Standard Tablet	$1999

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ITHUB/12	10BT Hub w/12 10T, Thk & Thn ports	$465
ITHUB/8	10BT Hub w/8 10T, Thn port	$229
ni EN/SC	Thn/10BT SCSI Ether w/DT& PB cable	$297
ni EN/SC10T	10T SCSI Ethernet w/DT & PB cable	$237
TEXT-FN	AAUI Hub w/4 RJ45 ports	$179

ASANTÉ

FNTNA	10BT or Thin FriendlyNet Media Adapter	$65
MGNB-TN	Mac II & Perf 600, Thk/Thn, 64K	$115
MGNB10T	Mac II & Perf 600, Thk, 10BT, 64K	$109
MGNB-TK/TN/10	Mac II & Perf 600 Thk/Thn/10BT	$165
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NEW Vista S6 600 to 4800 dpi, 24-bit color	$679
UC 1260 1200 to 9600 dpi, 24-bit color	$869
PowerLook Pro 1200 to 9600 dpi, 30-bit color	$2969

Pick Your Own Software Bundle
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Pro Bundle Full Photoshop, Kai's Power Tools & MagicMatch	$229
LE Bundle Photoshop LE, OmniPage Direct OCR & MagicMatch	$109

$3399

*Recommended for digital video on the 840AV, the FWB 2.0 GB **SledgeHammer 2000 FMF Wide Disk Array** and **SCSI JackHammer** optimize digital video recording and playback.*

FWB incorporated

SCSI JackHammer	$629
1 GB Hammer RAID NuBus Upgrade Upgrade your existing Apple or Apple or FWB drive to a 2 GB Hammer disk array. MacUser Editor's Choice Finalist.	$1669
17.5 GB SledgeHammer 17400FMF NuBus	$11,769
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4 GB SledgeHammer 4100FMF Wide	$5899

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SUPERMAC™

Spectrum Power 1152 Accelerated 24-bit up to 1152x870, 31 times faster than on-board	$1229
Thunder /24 with Free DSP Accelerated 24-bit up to 1152x870 with Photoshop DSP	$1549
SuperMatch 21 • TXL Energy Star compliant, WYSIWYG 1152x870, up to 1600x1200	$2099
Thunder II GX • 1600 CMYK accelerated up to 1600x1200	$3299
Thunder II GX • 1360 CMYK accelerated up to 1360x1024	$2749

radius

NEW Video Vision Studio 2.0	Call
Precision Color Display /17 Resolution up to 1152x870, switch-on-the-fly, Energy Star compliant	$1089
Le Mans GT Fastest card available, 24-bit up to 1152x870, fits in 7" NuBus	$1999
Precision Color Pro 24X Accelerated 24-bit up to 1152x870, fits in 7" NuBus	$1399
Precision Color Pro 24XP Accelerated 24-bit up to 832x624, fits in 7" NuBus	$499
NEW Color Pivot Portrait /15	$799

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APS MS 4110

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For Performance and value, The APS MS 4110 is the best deal going.

A stellar performer, the APS MS 4110 is the perfect internal match for the Mac that requires a low profile drive, sustained transfer rates as high as 3.5MB per second and seek times as low as 8.5ms. And yes this drive also includes an incredible 5 year manufacturer's warranty.

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Macworld 1994 World-Class Awards:
★ Best Customer Service
★ Storage
★ Alternative Storage

Macworld 1993 World-Class Award:
★ APS Hard Drive Series

Consultants Choice Award 1994:
★ Best Technical Support

MacUser Editor's Choice Award 1993:
★ Best New Storage Product

SCSI Sentry™

MW ★★★★ When all was said and done, SCSI Sentry did its stuff. All the problems I have experienced became history...and this device may well be the cure for your SCSI Woes. Even if your SCSI setup is working OK, I heartily recommend SCSI Sentry as an extra ounce of protection.

— "MacWorld SEPT 94"

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Benefits	SCSI Sentry
Optimizes Overall SCSI Performance	✓
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Get the APS *I*^{mr}540 internal for only $299!

The APS *I* 540 delivers seek times as low as 12ms and transfer rates as high as 2.3MB per second. As an extra bonus its Magneto Resistive Head technology allows data to be more densely packed on the drive platter.

APS *I*^{mr}540

$399*

APS HARD DRIVES

For your Mac or Power Mac

Model	Capacity	Internal	SR2000
163MB - 1003MB			
APS Q 270[2] Maxtor 7290 mechanism	276MB	$199	$299
APS *I*^{mr} 360[2] IBM DSAS 3360 mechanism	342MB	299	399
APS *I*^{mr} 540[2] IBM DSAS 3540 mechanism	522MB	289	399
APS Q 540[2] Quantum 540 mechanism	516MB	329	429
APS *I*^{mr} 720[2] IBM DSAS 3720 mechanism	700MB	499	599
APS MS1.2AV[5] Micropolis 2210AV mechanism	965MB	759	859
APS *I*^{mr}1.0[5] IBM 0662 mechanism	1003MB	699	799
APS MS 4110[5] Micropolis 4110 mechanism	1002MB	649	749
1029MB - 2845MB			
APS Q 1080[2] Quantum 1080S mechanism	1029MB	$699	$799
APS MS 1.7AV[5] Micropolis 2217AV mechanism	1612MB	999	1099
APS MS 1.7[5] Micropolis 2217S mechanism	1682MB	929	1029
APS *I* 2.0[5] IBM 0664 mechanism	1920MB	1299	1399
APS ST 2.0[5] Seagate ST 12550N Barracuda mech.	2040MB	1399	1499
APS MS 3.0G[5] Micropolis 1936 mechanism	2845MB	1999	✾2199
APS ST 4.0[5] Seagate ST 15150 mechanism	4294MB	2799	2899
APS ST 9.0[5] Seagate ST410800N mechanism	8673MB	4149	✾4349

Internal drives for Quadra 800 and Centris 610 available.
DATerm™ patent pending
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1-5 *Denotes length of manufacturer's warranty*
✾ *External Case is Special Full Height Only*
* *Internal Price Listing*

POWERBOOK DRIVES

Model	Capacity	Internal	LW Pro 630	Companion II AC/DC
APS PB 85[1]	80MB	—	$249	—
APS T 340[1]	324MB	399	399	549
APS T 520[1]	500MB	599	549	649

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The Perfect Home for your 2.5" PowerBook Drive.

Companion II Enclosures	AC	AC/DC
Enclosure	$89	$139

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APS HyperDAT

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APS DAT

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APS DAT $799

"In the fiercely competitive world of the humble desktop hard drive, nobody sweats the details more than APS. Elegant design, quality components, and rock-solid construction distinguish the compact APS SR 2000 Case."
— *Editors of MacUser*

Macworld's 1994 World-Class Award for Alternative Storage goes to the APS line of DAT Drives.

DAT

Model	Capacity*	Internal	SR 2000
APS DAT[2]	1.8-2G on 90m tape	$749	$799
APS Turbo DAT[2]	4-5G on 90m tape	949	999
APS HyperDAT[1]	8-10G on 120m tape	1149	1199

**Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.*

DAT Media (Units)	*1-4*	*5-19*	*20+*
60 meter DAT Tapes —	*$10*	*$9*	*$8*
90 meter DAT Tapes —	*12*	*11*	*10*
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All APS DAT Drives Include Retrospect by Dantz & 1 FREE DAT Tape

APS 1.3 MO $1999*

** Does not include cartridge. External Configuration*

CD ROM

Model	SR 2000
APS T 4101	$299
APS T 3401	399

MAGNETO OPTICAL

Model	Internal*	SR 2000
APS 128MB MO[1]	$629	$729
APS 230MB MO[1]	899	999
APS 1.3Gig MO[1]	2009	2109

All MO Drives Include 1 FREE Cartridge

MO Media (unformatted)	*1-4*	*5-19*	*20+*
128MB cartridge —	*$35*	*$34*	*$29*
230MB cartridge —	*46*	*45*	*40*
1.3Gig cartridge —	*110*	*109*	*104 (1024MB/M)*

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APS SQ 555[2]	44MB	$259
APS SQ 5110c[2]	44/88MB†	429
APS SQ 5200[2]	200MB††	499
APS SQ 3105[1]	105MB	329
APS SQ 3270[1]	270MB	499

† Does not format 44MB cartridges
†† Does not format 44MB & 88MB cartridges
All SyQuest Drives Include 1 FREE Cartridge

SyQuest Media	*1-4*	*5-19*	*20+*
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105MB cartridge —	*59*	*57*	*56*
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Prices listed are for unformatted media.

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- All prices and specifications are subject to change without notice.
- Refused orders subject to restocking fee.
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- All external drive products and cases come with a premium 25 x 50 SCSI cable. Companion II drives, (not cases) include a 50 x 50 PowerBook SCSI cable.
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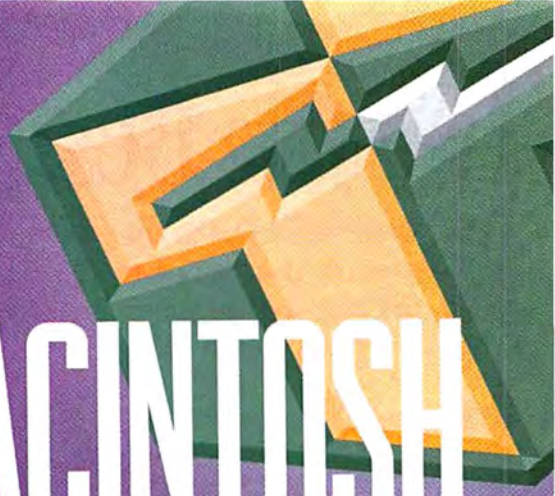

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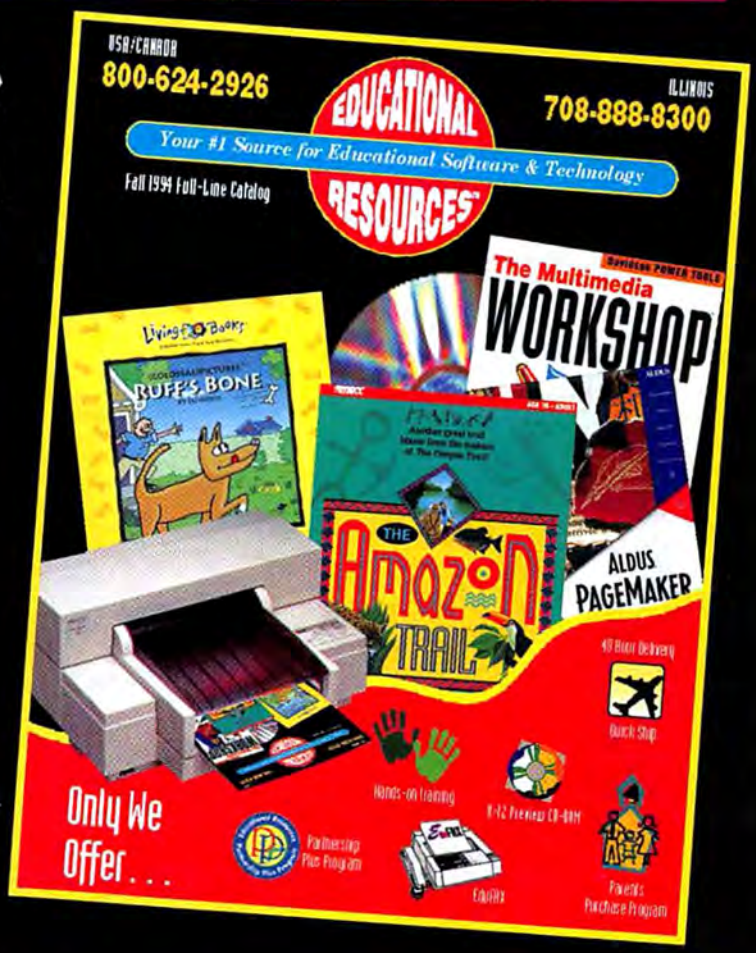

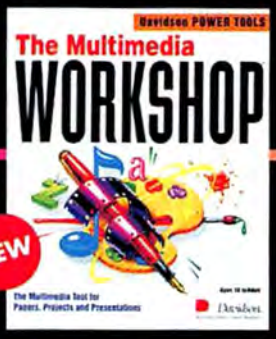

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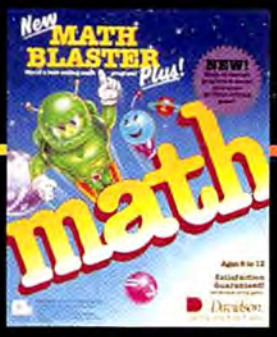

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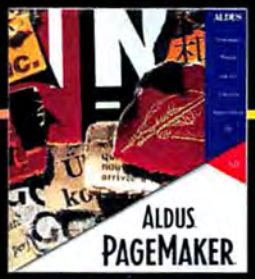

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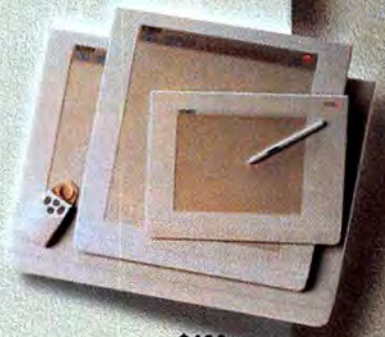

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2.4GIG	3.5"	9MS	ST12400N	$ 1315
2.5GIG	3.5"	8MS	Barracuda 2	$ 1440
2.5GIG	3.5"	8MS	Barracuda 2 WIDE	$ 1499
3.4GIG	5.25"	10MS	Elite 3	$ 1999
4.1GIG	3.5"	8MS	BARRACUDA 4	$ 2335
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545MB**	3.5"	12MS	CFA540S	$ 450
1.0GIG	3.5"	9MS	CFP1060S	$ 699

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CAPACITY	SIZE	ACCESS	MODEL	EXTERNAL
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2.2GIG	3.5"	9.5MS	E2160S	$ 1159

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CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
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Sony	GDM-15SF1 15"	$ 469
Sony	GDM-17SE1 17"	$ 1059
Sony	GDM-20SE1 20"	$ 1899
RasterOps	Horizon 24	$ 2259
RasterOps	Paintbd Turbo	$ 1159
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650MB	Sharp		40MS		$ 1699
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520MB	Tandberg TDC 3660	DC6250	$ 565	$ 625
1.3-2GIG	DC DAT	4MM	$ 729	$ 789
1.3-4GIG	DC DOUBLE DAT	4MM	$ 839	$ 899
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4.0GIG	Sony 5200 DDS-2	4MM	$ 989	$ 1049
4.0-8GIG	Sony 5000 DDS-2	4MM	$ 1029	$ 1089
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Circle 121 on reader service card

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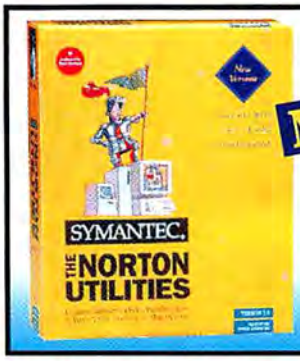

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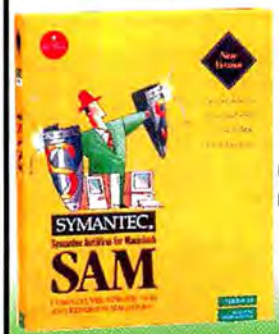

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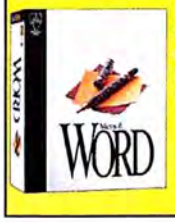

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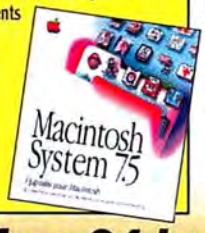

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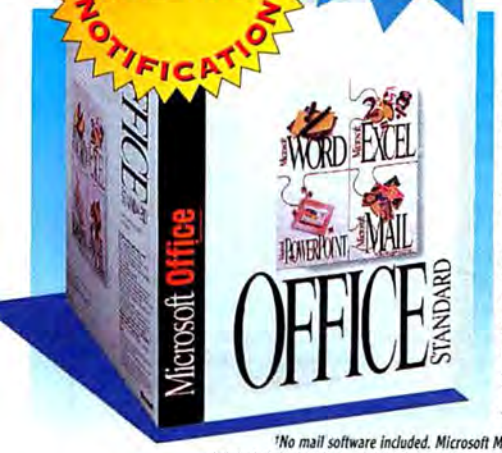

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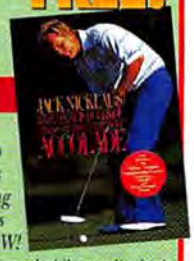

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9100MB	10ms	5400	256K	Micropolis	5 Years	$3999	$4099

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PowerPro 80MHZ 60/Acc..1995
Turbo 040 40MHZ w/Cache949

Keyboards/Accessories

Apple Extended Keyboard....158
DGR Extended Keyboard 79
Kensington Turbo Mouse 99
MicroSpeed Keyboard Deluxe 89
Powercase II for Powerbook 79

Software

Utilities Software

Adobe Super ATM 99
Adobe Type Reunion 42
Auto Doubler 2.0.....56
Central Point Mac Tools 3.0.....86.95
Disk Doubler 4.0 55
Disk Lock 3.0.....72
DOS Mounter 4.0 49
Fast Back Plus 3.0 99
Folder Bolt 1.02 69
Fileguard 2.7.....175
Fontographer 4.0.....259
FWB HDT Toolkit.....129
Mac Link Plus Translators 7.0....115
Mac Tools 3.0 PPC 95
Norton Essentials PB 1.0 85
Now Utilities 4.0.2 77
Quick Keys 3.0.1.....105
Retrospect 139
Stuffit Deluxe 3.0.....64
Virex 5.0.....59

Graphics/Word Processing

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Adobe Illustrator 5.5.....369
Adobe Photoshop 3.0 559
Adobe Premiere 4.0.....535
Aldus Freehand 4.0 369
Aldus Pagemaker 5.0 449
Aldus Persuasion 3.0 322
Canvas 269
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Word Perfect 3.0.....326

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Foxbase 2.01.....319
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MS Office 4.2 497
MS Project 3.0.....429
Now Up to Date 2.0.....60
Power Point 4.0.....322

Communications Software

Delrina Fax Pro.....73
Fax STF.....45
Microphone 5.0.....135

CDROMs

7th Guest 51
Flying Nightmares Power PC ..55
Hilarious 25
Iron Helix 59
Journey to the Yangtzee 37
The Journeyman Project
NFL Magazine 25
Myst.....51
PGA Tour Golf II 60
Wayzata Assorted.....19

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540 MB	12 ms	4500	128K	290	350

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256 MB	17ms	335	415

Empire and Pro Series

Capacity	Seek	RPM	Disc Cache	Int	Ext
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700 MB	10 ms	4500	512K	385	445
1080 MB	10ms	5400	512K	640	700
1440 MB	9.5 ms	5400	512K	825	885
1800 MB	10 ms	4500	512K	995	1055
2100 MB	9.5 ms	5400	512K	1135	1195

Pro & Empire drives have a 5 year factory warranty and are SCSI 1 & 2 compatible.

Seagate

Capacity	Model	Size	Access	RPM	Disc Cache	Int	Ext
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1.9 GB	ST1240ON	3.5"	9ms	5400	1024K	1265	1310
2.4 GB	Barracuda 2	3.5"	8ms	7200	1024K	1335	1395
4.2 GB	Barracuda 4	3.5"	8ms	7200	1024K	Call	Call
3.4 GB Elite 3	ST 43400N	5.25"	10ms	5400	512K	2045	2145
9 GB Elite 9	ST 410800N	5.25"	11ms	5400	512K	Call	Call

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Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
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1.2 GB	3.5"	M2210	10 MS	5400	512K	640	700
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1.2 GB	M2694ESA	3.5	8.5 ms	5400	512K	$650	$710

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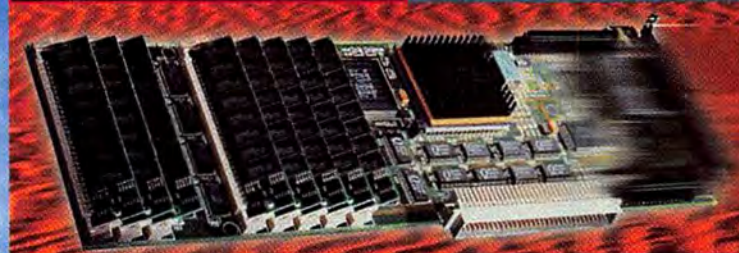

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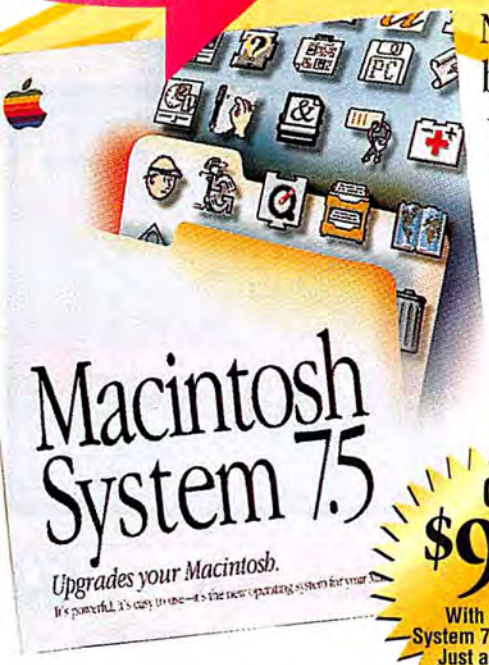

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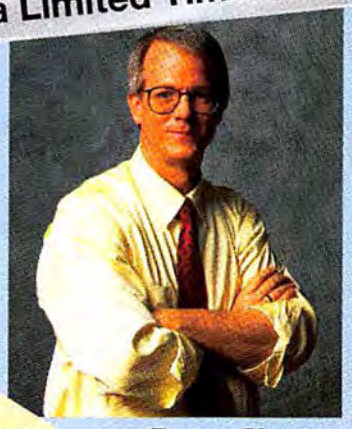

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PRODUCT INDEX
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PRODUCT INDEX

Category	Page No.
ACCESSORIES	.247
Covers	
Computer Mouse Pads	
Diskettes	
BUSINESS TOOLS	.228-230
Bar Code	
Cataloging Software	
Credit Authorization	
Point of Sale	
Real Estate	
EDUCATIONAL & RECREATIONAL	.247-248
Astrology	
Degree Program	
Discount Software	
Genealogy	
Grading	
Music	
Religion	
GRAPHICS	.249-250
CAD/CAM	
CD ROM Photos	
Clip Art	
Fonts	
Graphics Translators	
Magazine	
MOBILE COMPUTING & PDA's	.251
Battery Charger	
PowerBook Accessories	
MULTIMEDIA & CD-ROM	.249
Presentation	
Quicktime Flipbook	
NETWORKING & COMMUNICATIONS	.251
BBS	
PROGRAMMING & UTILITIES	.251
Languages	
SERVICES & SUPPLIES	.251-252
Computer Insurance	
Computer Repair	
Data Recovery	
Patent Research	
Prepress Services	
Slides	
SPECIALIZED MARKETS	.251
Languages	
Medical	
SYSTEMS & PERIPHERALS	.230-240
Hard Drives	
Switch Box	
Printers	
UPGRADES & MEMORY	.241-246

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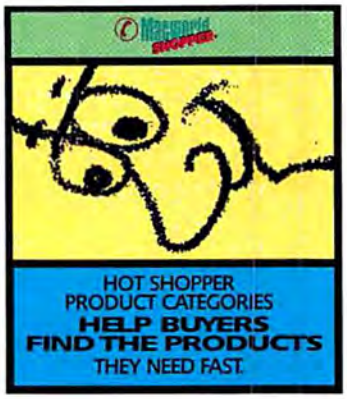

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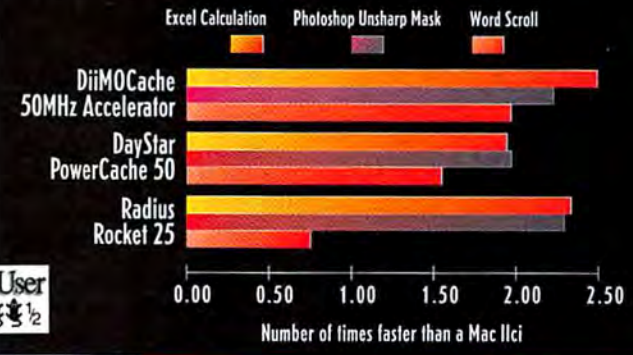

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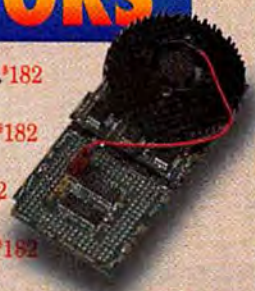

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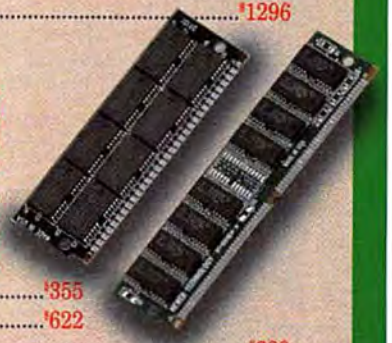

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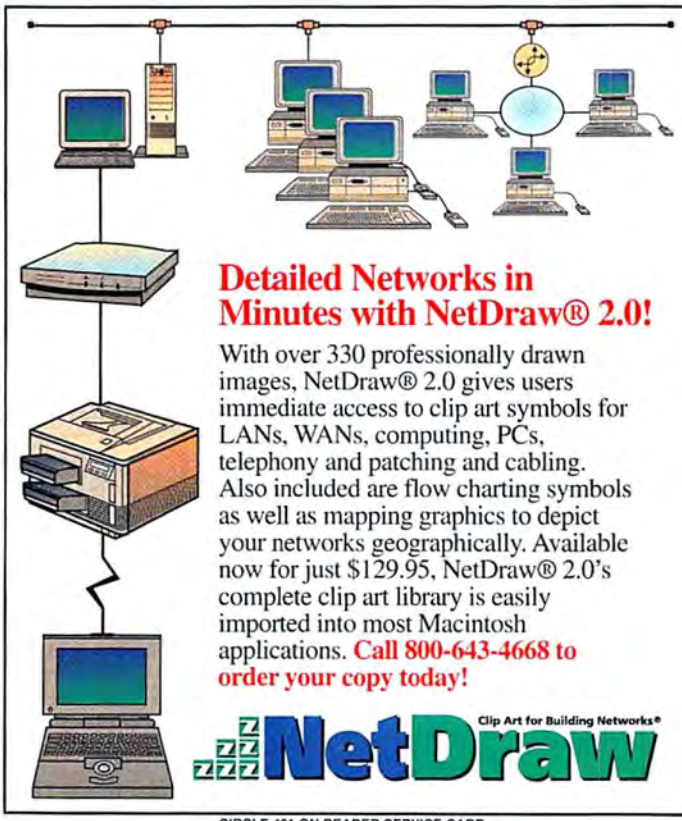

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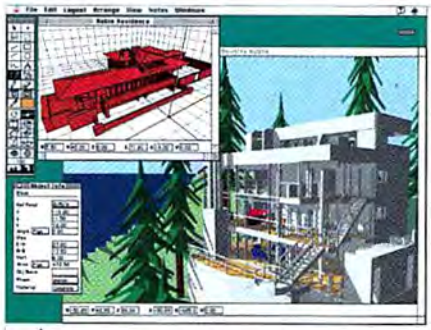

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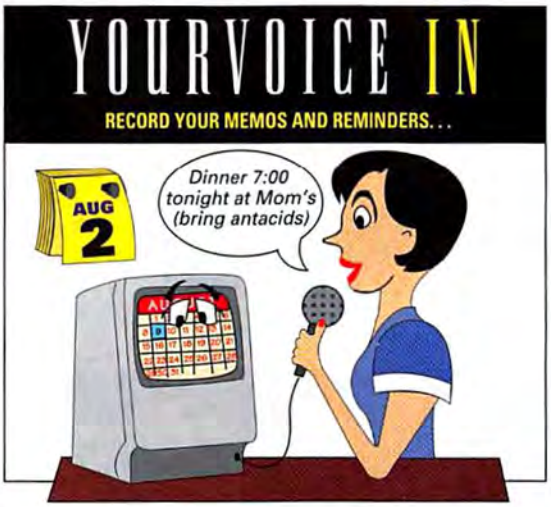

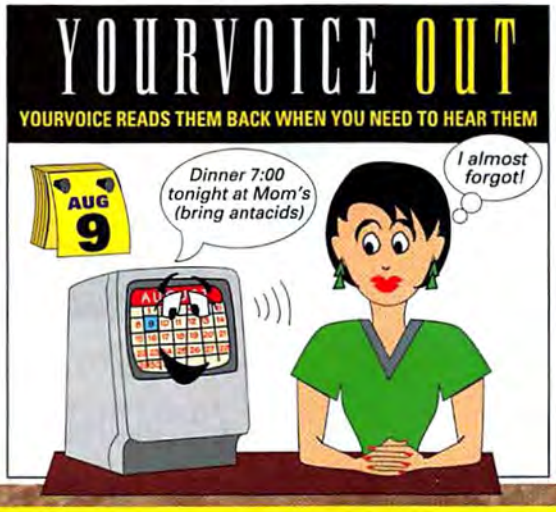

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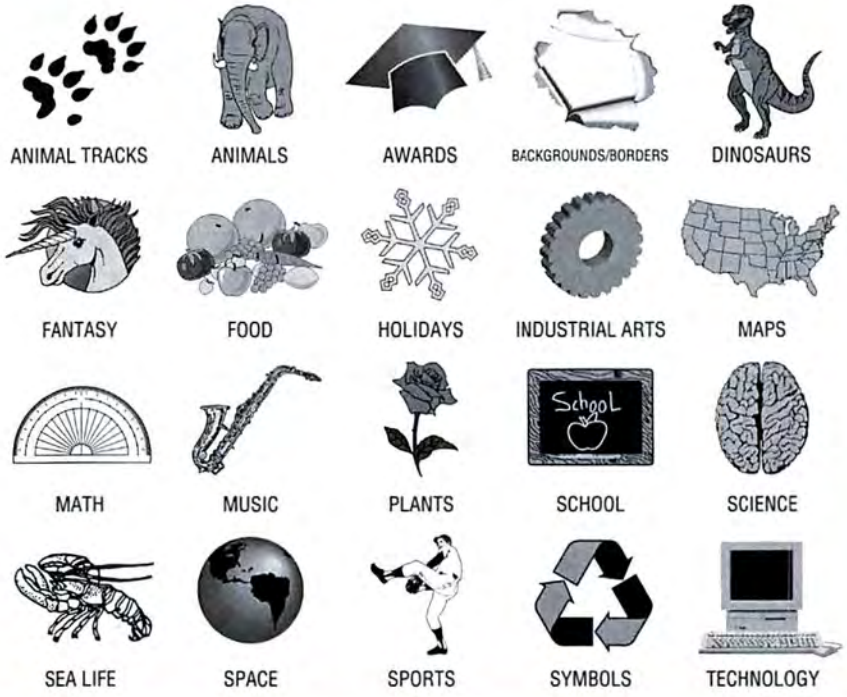

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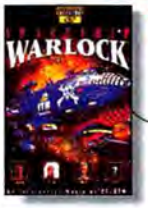

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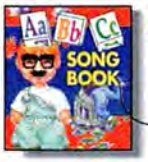

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WISE GUY

BY GUY KAWASAKI

Steve Jobs to Return as Apple CEO

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THE FOLLOWING PRESS RELEASE moved over PR newswire on Monday, September 31, 1994, at 8:32 a.m., EST.

FOR IMMEDIATE RELEASE. Contact: Regis Makaha, Apple Computer, Inc.; (408) 996-1010, AppleLink: uni.wish.

CUPERTINO, Calif.—September 31, 1994—The board of directors of Apple Computer, Inc., today announced that Steve Jobs, the cofounder of Apple who was purged by John Sculley in 1986, will return to Apple as chief executive officer and chief technical officer.

Steve Jobs is currently the president of Next, Inc. In his new position, he will be responsible for the overall direction and vision of Apple Computer. Michael Spindler, currently chief executive officer, will relinquish this post and become chief operating officer of Apple Computer.

As a cofounder of Apple and the father of Macintosh, Jobs brings back to Apple the type of visionary leadership that enabled Apple to create three of the four personal computer standards (Apple II, Macintosh, and Windows). In addition, because of his experience at Next, he is expected to bring a newfound sense of humility back to Apple Computer.

"Returning to Apple has been a seductive option for me ever since John decided to concentrate his technical prowess on cellular phone technology," said Jobs from the Redwood City, Calif., headquarters of Next. "At first I dismissed the idea when the Apple board contacted me. However, because I'm now a father, I needed a steadier source of income."

Board member Michael Markula describes the recruitment process, "Basically, we challenged Steve: 'Do you want to spend the rest of your life selling Unix with a sugarcoating, or change the world?' When we presented it this way, Steve reacted positively to our pitch."

"Who were we trying to kid?" asked Michael Spindler. "I am not a product visionary, and I don't want to be. My strength is fiscally responsible management and providing a reality check. Plus, I was tired of product managers complaining when I demonstrated their products. Steve can do this better than anyone. We'll soon be completing each other's sentences like Steve and John used to."

Referring to Steve Jobs's widely reported largesse toward early Macintosh Division employees, a spokesperson for Odwalla Juices said, "Our period of greatest profitability occurred when Steve ran the Macintosh Division. We see a tremendous opportunity to reenter the corporate market for fresh orange juice." A spokesperson for the new, employee-owned United Airlines chimed in, "When we heard the news, we called Boeing and doubled the number of first-class seats for the planes we had on order."

Bill Gates, chief executive officer of Microsoft, offered his support of Jobs's return, "Macintosh always has been and always will be a big part of our applications software business, and Apple is the preeminent R&D site for Microsoft system software. We believe Steve will revitalize Apple's work in system software and provide us something to copy for the next 10 to 20 years. Expect to see examples of Steve's vision in our next version of Windows, code-named Cleveland."

The Apple board also announced that it was buying Next's assets for $200 million. The intent is to fold Next Step's object-oriented programmability into future versions of the Macintosh operating system. John Warnock, CEO of Adobe Systems, commented, "With Steve's return, we foresee a close relationship with Apple, resulting in an unbelievably lucrative royalty stream for Display PostScript."

In addition to the source code of Next Step, as consideration for buying Next, Apple will receive 4,000,000 laser-printer toner cartridges from Canon, and Ross Perot will appear in a series of 30-minute PowerBook infomercials—complete with QuickTime-animated flip charts.

Headquartered in Cupertino, Calif., Apple Computer, Inc. (NASDAQ: AAPL) develops, manufactures, and markets too many personal computer models; a handful of personal interactive electronic systems; and ClarisWorks. Apple hardware is sold for use in desktop publishing, desktop publishing, and desktop publishing. A recognized pioneer and innovator (as opposed to imitator) in the personal computer industry, Apple sells its products in more than 120 countries and provides support in less than 10. **m**

GUY KAWASAKI's fantasies are his own, and only sporadically reflect those of *Macworld*. His latest book is *Hindsights* (Beyond Words Publishing, 1994). He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He can be reached at Kawasaki@radiomail.net.

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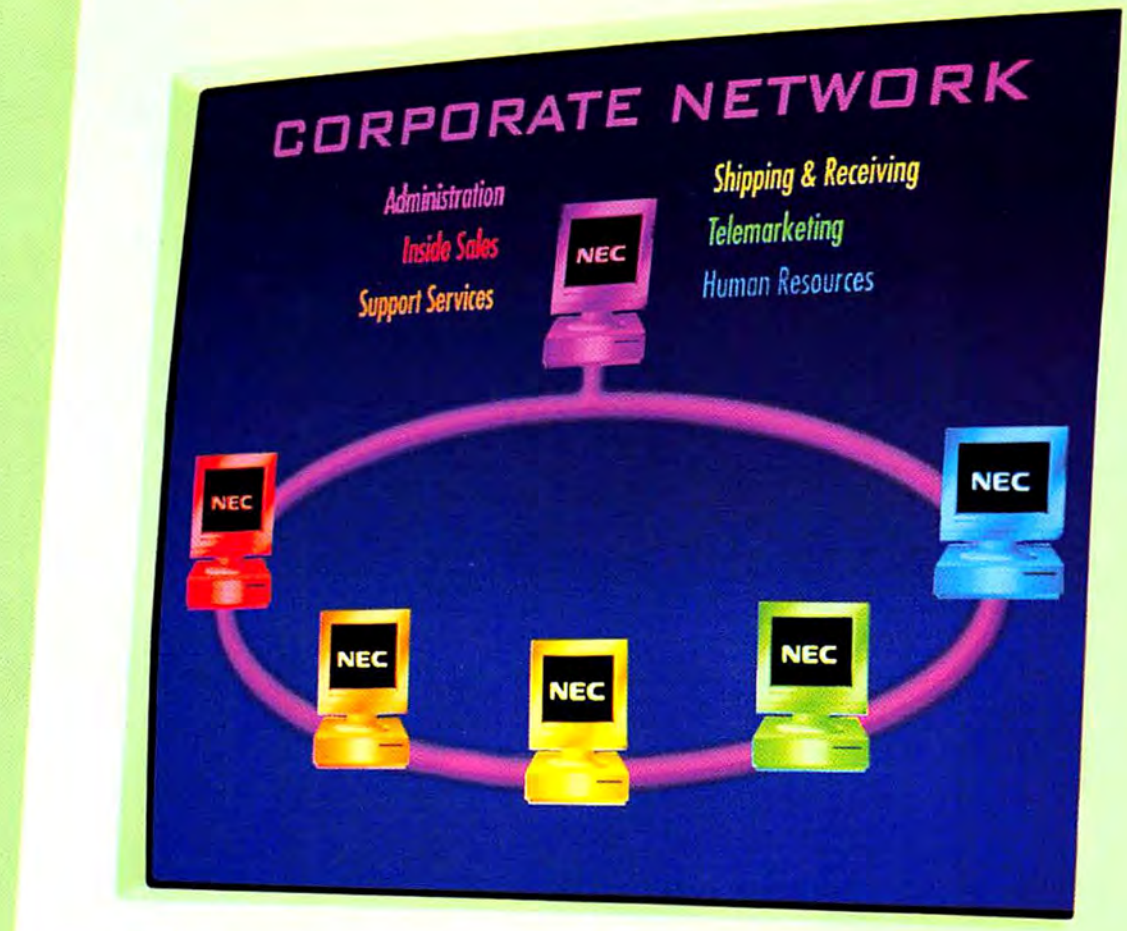

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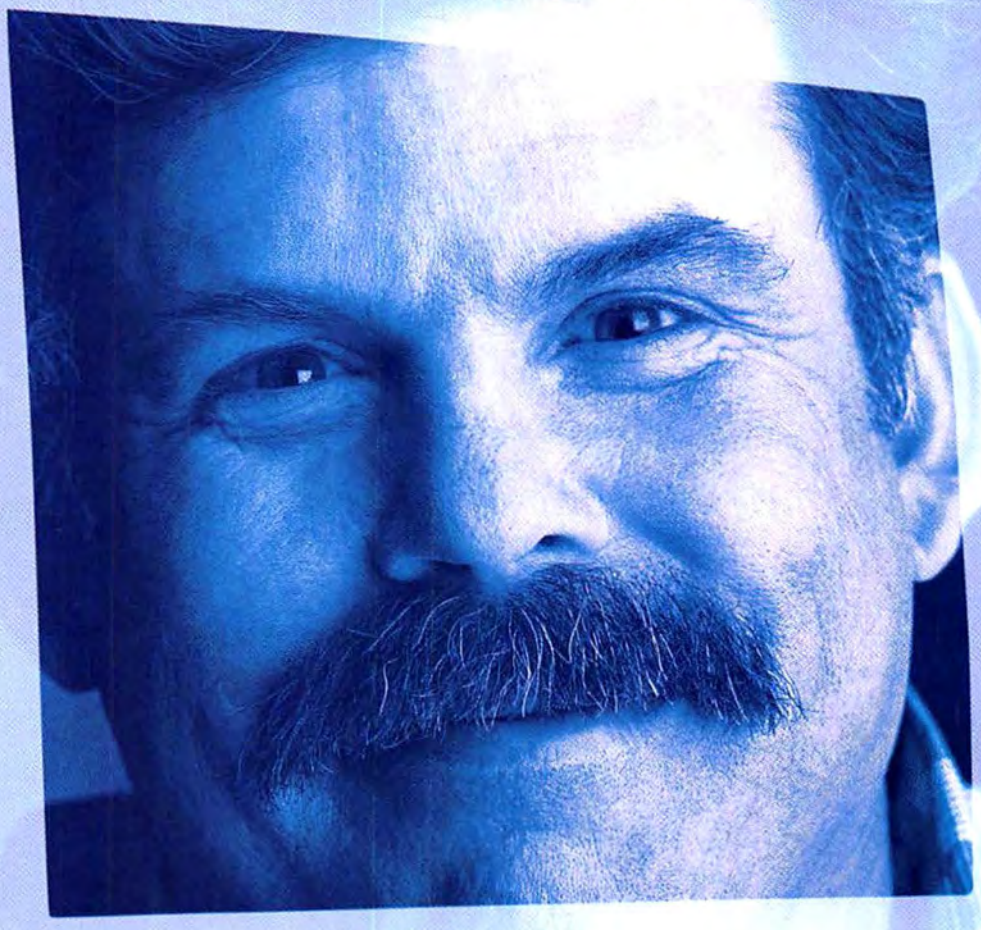

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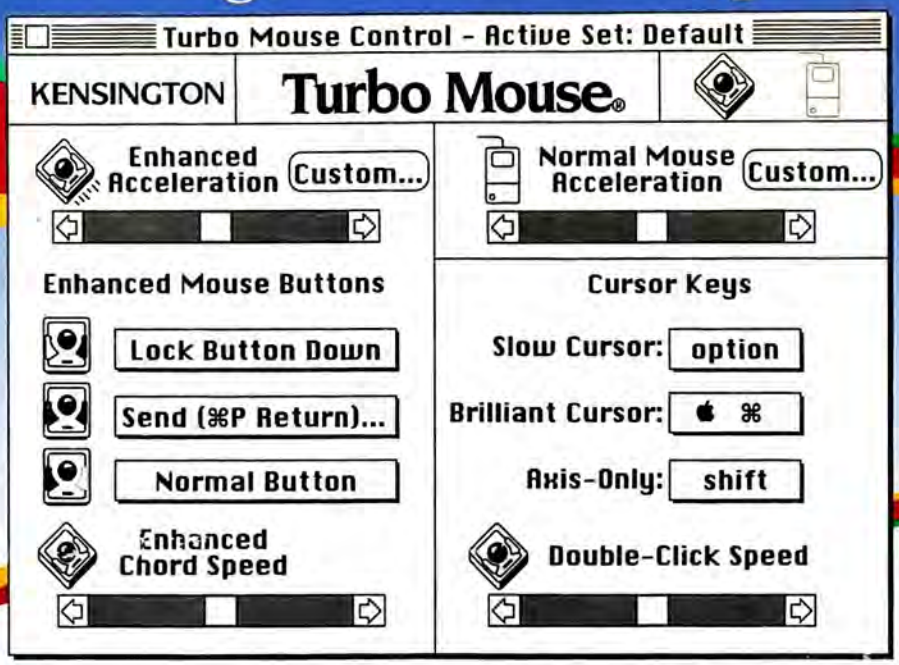

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