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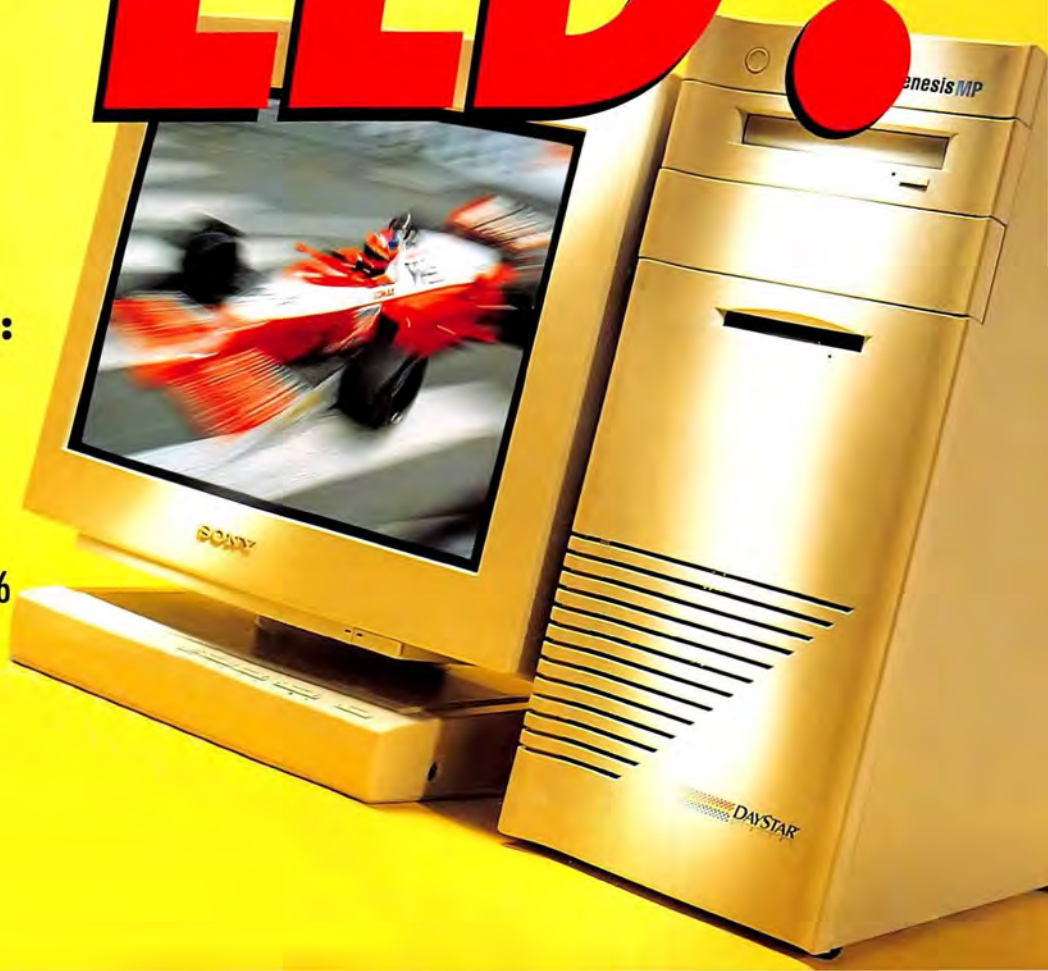

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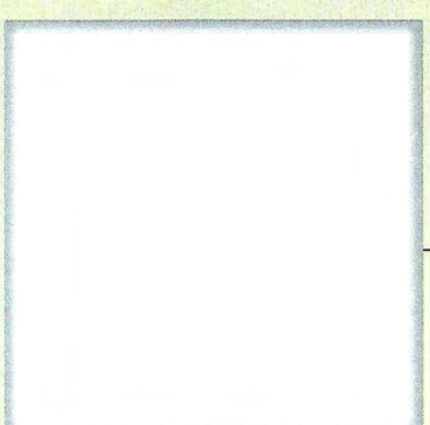

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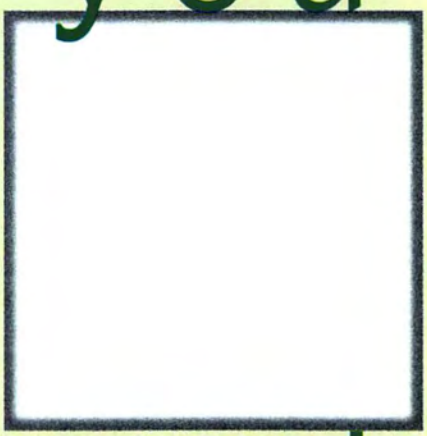

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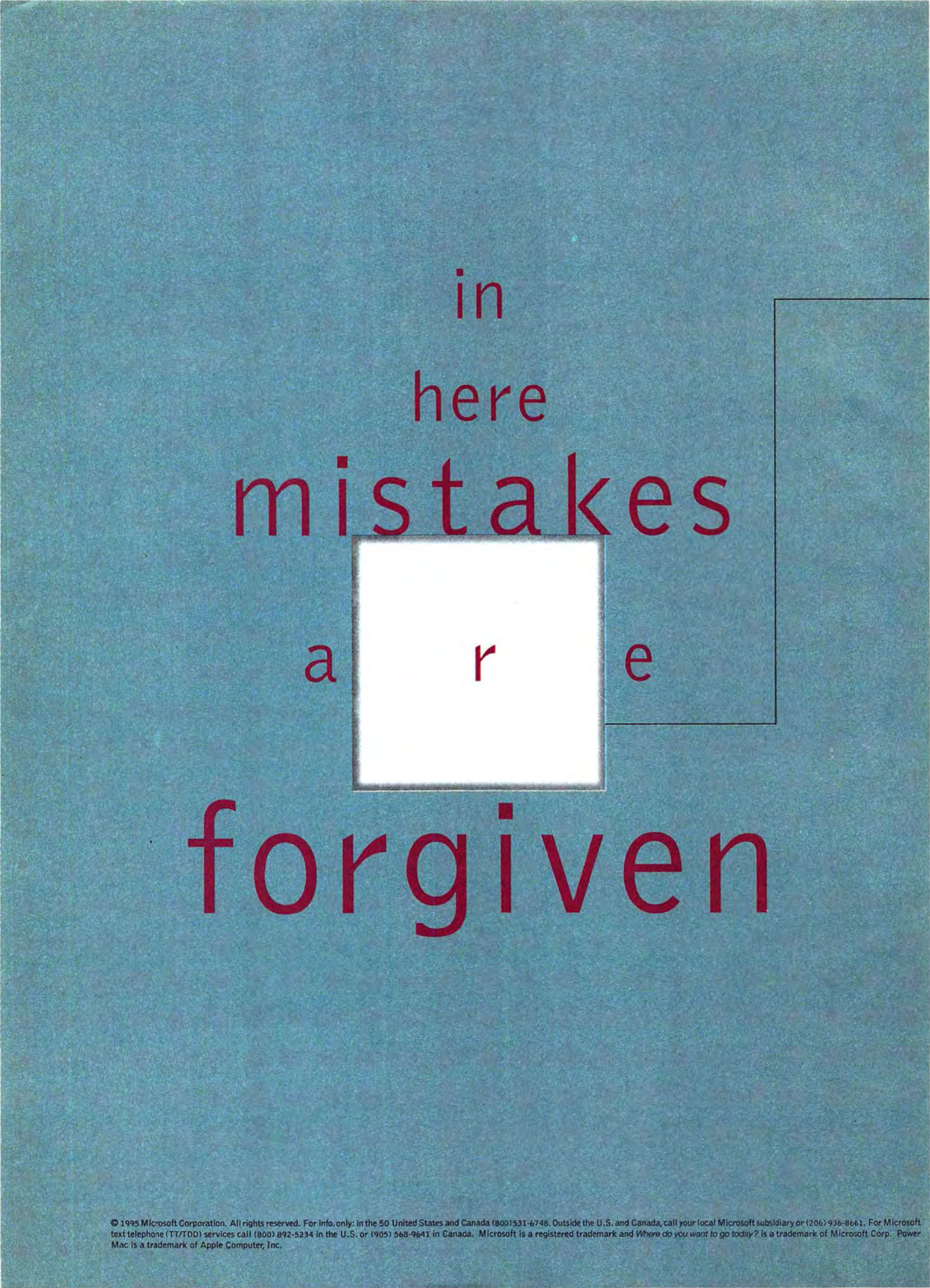

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Your mind
Is racing.
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Are racing
To keep up
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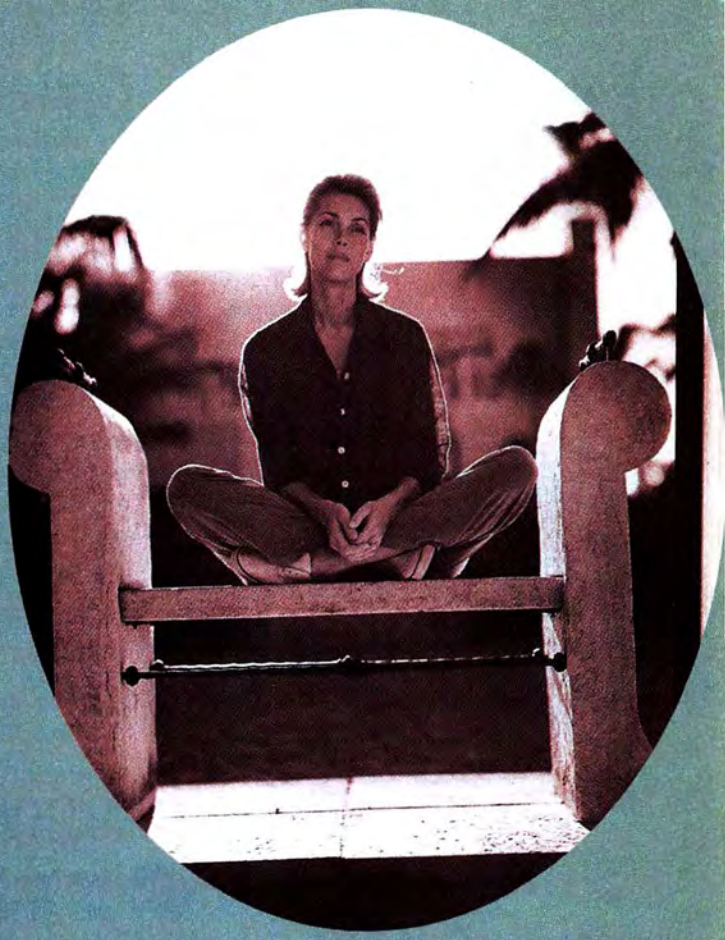

YOU WRITE

You begin
A new sentence
With
A lowercase letter.
This mistake is corrected
Automatically.

YOU REVISE

Knowing there are
100 levels
Of Undo.
And 100 levels
Of Redo.
Just in case.

YOU WRITE

You begin a new
Sentence with
An abbreviation
You created.
It becomes
An entire phrase.
Automatically.

YOU REVISE

In
Print preview
You change
Margins
Typefaces
And words.

YOU WRITE

Until you have finished.
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And the block of words
Can become
A letter.
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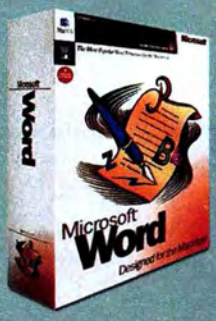

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MacUser
JUNE 1996 / VOLUME 12 NUMBER 6

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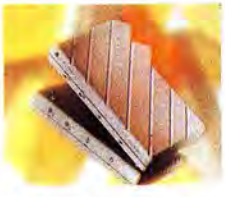

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Cover photo / Steven Underwood

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FORMULA 1 PHOTOSHOP

Soup up your system for maximum performance.

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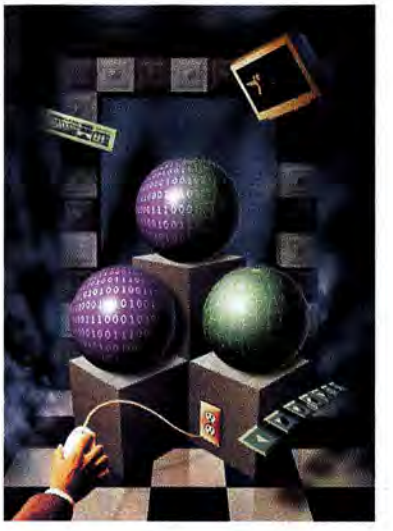

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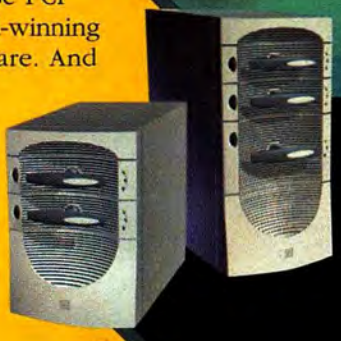

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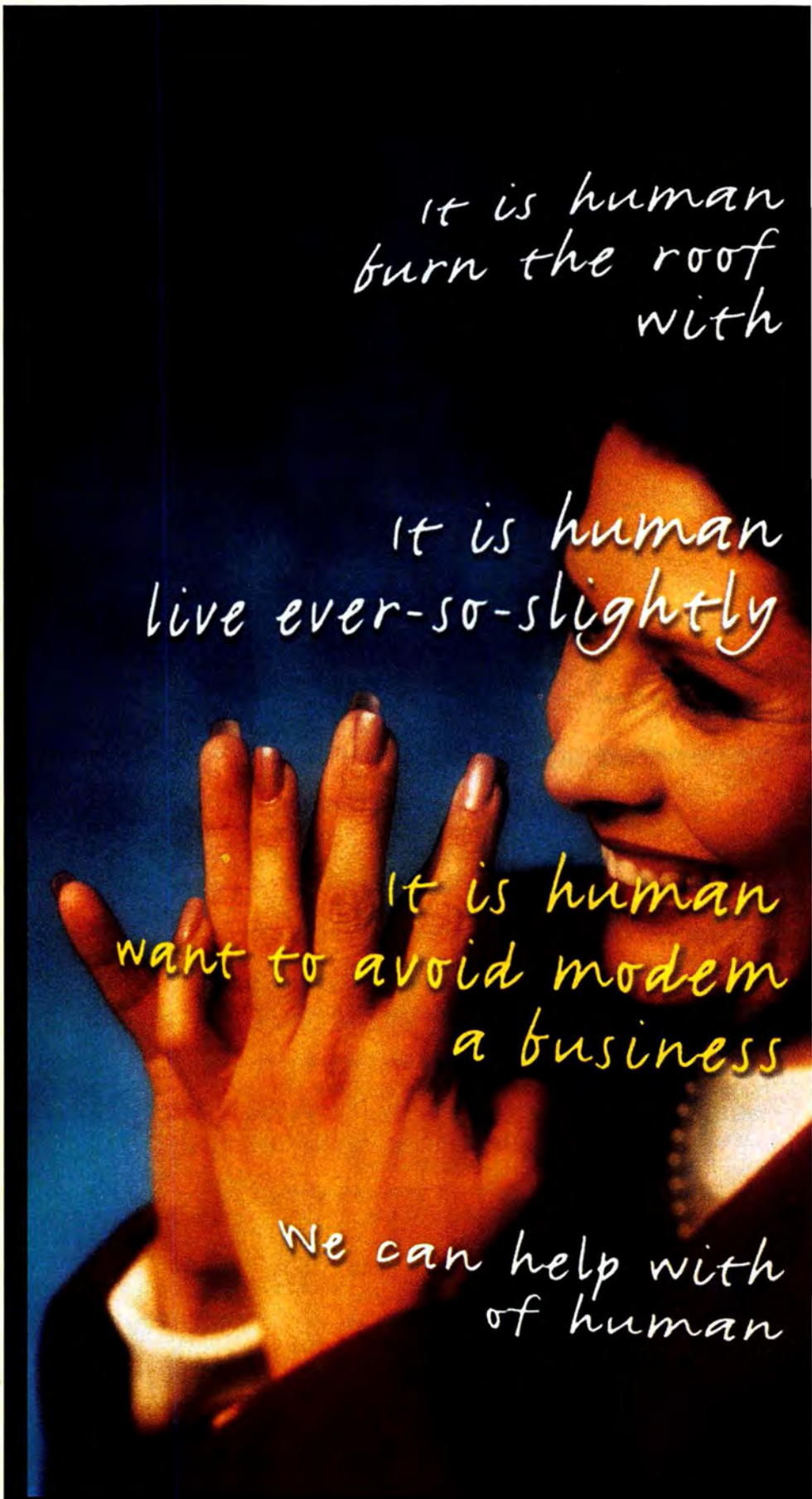

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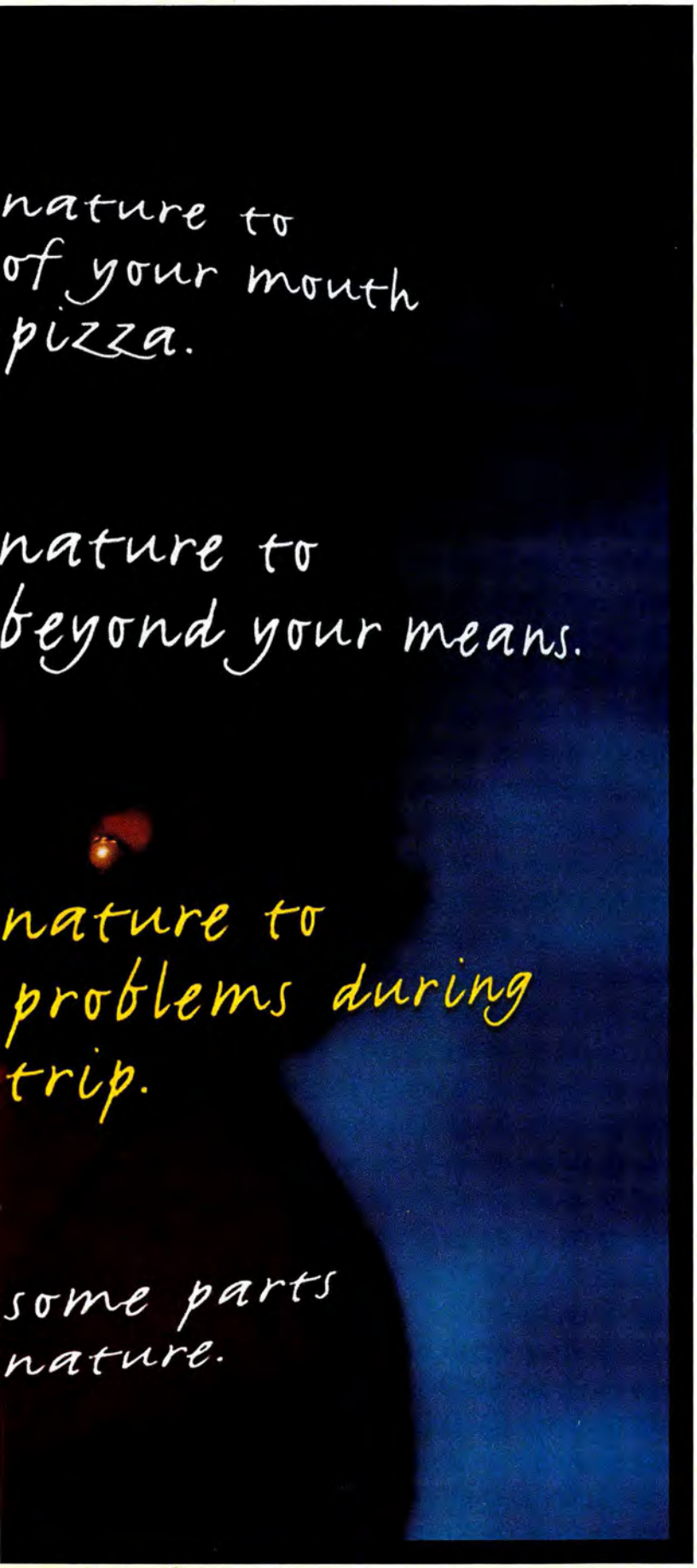

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LETTERS

Web Wonders

AS A RATHER NEW Web user, I found your article on 101 must-see Web sites ("Welcome to the Web," March '96, page 76) a joy to use. It gives us inexperienced users an excellent place to start exploring all the wonders of the Internet. It's an information junkie's dream come true! Keep up the great work.

Peter Klimon
via the Internet

I THOROUGHLY ENJOYED every one of the 101 Web sites you guys recommended in your March '96 issue.

Keep up the good work!

Ken Laskin
ken@cyberverse.com

I REALLY ENJOYED your most recent issue, especially because it dealt with the Internet and many Net-related topics.

Although Web-site listings aren't normally very exciting, your list was excellent and informative. I'm a relatively new user of Macs, and your publication has gone a long way in helping me figure out how to make my way around a desktop.

Evan S. Jacobs
jacobs@j51.com

You Fixed It!

THANK YOU. Thank you. Thank you. "System Fix-It Tricks" (March '96, page 125) finally gave me the answer that neither Apple nor U.S. Robotics could.

I had been experiencing problems with my U.S. Robotics modem. After I spent 20 minutes on hold, U.S. Robotics told me to try to download a "printer patch" from somewhere on Apple's Web site. However, nobody at either company could tell me exactly where to look or what the software was called.

I was reaching my breaking point until I bought the March *MacUser* and spotted your article. Finally, someone specifically provided the answer about what exactly I was looking for. Installing Apple's System 7.5.2 Printing Update 1.1, which fixes a host of serial-port-related problems, appears to have finally resolved my dilemma!

Gregory Farnham
via the Internet

TED LANDAU, YOU WERE RIGHT on target. I've experienced every problem you mentioned! I had spent endless days and nights trying to fix bugs before reading your report.

I'm glad you're convinced that all these problems are part of a plot to force you to start working on a third edition of your book (*Sad Macs, Bombs, and Other Disasters*). I'll be the first to order it!

James D. Kitahara
jdkit@aol.com

I OWN A POWER MAC 7500 and have just read your "System Fix-It Tricks." You mentioned that my hard drive may have a manufacturing flaw. Should I replace it, or will the Disk Spot Check software mentioned fix the problem? Where can I find Disk Spot Check?

Glenn Fitzgerald
via the Internet

/ No, you do not need to replace the drive. The flaw has to do with spurious data placed on the hard disks of some Power Mac 5200, 6200, 7100, 7200, and 7500 models when they were formatted at Apple. This data is misinterpreted by Norton Disk Doctor when it checks these disks. The result is that NDD can appear to erase your disk when the utility is run and you elect to fix the "problems" it reports.

WRITE TO LETTERS

c/o *MacUser*
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letters@macuser.com

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OPEN FOLDER

Get me a CBC Chem 7, stat! We're not doctors, but we'd love to play them on TV. In the meantime, we'll just have to dispense advice from the bully pulpit that is Open Folder. Our first plea for help comes from reader Tony Chin: "After playing Marathon for 30 minutes, I became sick. The symptoms were nausea and head-spinning. Was I sick because of the game, or should I go see a physician?" We often feel nauseated after being blasted to smithereens by a missile during our regular Marathon marathons here at *MacUser*, but head-spinning has never been part of the equation. Have you considered an exorcist?

Closer to home is the query we received from Tom Nigman. "Is it a good idea to unplug your Mac if you're not going to use it for 60 days or so?" Sure, but if your Mac complains of nausea or head-spinning, remove Marathon from your Mac's hard disk immediately.

We've deluded ourselves into believing that Open Folder has its fingers on the pulse of the Mac universe. But John Teti Jr. gave us a shot of cold, hard reality: "I am surprised that the writing staff at *MacUser* failed to report on this major development in the Mac world: Recently, a Mac was given away on *The Price Is Right* for the first time ever. What more could Apple ask for?" Now we know that Apple is a brand name on a par with Turtle Wax, Rice-a-Roni, and Dicker & Dicker of Beverly Hills. Can Netscape say the same? We didn't think so.

Worming their way into the hearts of millions are two companies that have come to define the online world. Witness reader Jun Lee's devotion to these industry giants: "Thanks to the generosity of America Online and CompuServe, I have accumulated over 40 disks. I've happily unlocked and reformatted each one. Thanks to the folks in those companies' marketing departments!" We're with you, Jun. So, don't you think it's high time AOL started sending out its software on Zip disks? And how about free CompuServe-brand 28.8-kbps modems? Our mailboxes are waiting.

ILLUSTRATION / MARGARET MCMULLIN

Disk Spot Check can prevent the problem permanently by erasing the problem data. If you have already lost your files due to this problem, the docs that come with Disk Spot Check explain how to recover them. You can find Disk Spot Check in any Info-Mac archive at disk/norton-disk-spot-check.hqx. / TL

Turn the Page

YOUR ADOBE PAGEMILL review (March '96, page 45) rightfully calls this product a "wonderful authoring tool," but I don't believe it's ready for the four-mouse stamp of approval.

In addition to the product's limitations that you mentioned, perhaps the biggest problem with PageMill is its inadequate documentation. First-time Web authors had better have an experienced assistant close by when they start using PageMill!

On the plus side (and I really do like the program!), the image-conversion features are terrific and the Raw HTML feature is an ingenious solution to dealing with authoring for various browsers.

William C. Griffin
griffinwc@conrad.appstate.edu

Net Environmentalism

HAVING READ Maggie Canon's column on cable modems ("Cable Ready," March '96, page 21), I must comment on the Internet's precarious future. The Internet is currently growing at an unheard-of rate. Unless something is done fast to increase the bandwidth of the Internet's backbones, data transfer will soon slow to a crawl — no matter how fast your connection is!

Cable companies may say that cable modems will be ready in the next year or two, but there will be huge installation problems. My guess is that the cable modem is a little further off than you may think.

To everyone out there who's making Web pages: Keep your file sizes down, and go easy on the server push! No one likes waiting to see a page, so keep the fancy graphics and pictures small or compress them. Remember that JPEG is your friend. As the number of users increases, the Internet's bandwidth is becoming a precious commodity — so conserve it!

Fred Kahl
fredini@inch.com

I Got Your Web Right Here

I WAS SURPRISED that you recommend that people not learn HTML ("Web? What Web?", March '96, page 111). Even with utilities such as PageMill, knowing at least basic HTML is essential for creating Web pages. After all, what if you wanted to update your Web page without PageMill or try out something you saw on someone else's Web page? You can't. Without knowing HTML, you'll find a Web page nothing but a mass of indecipherable garbage.

Frank Gerratana
frankg@pcnet.com

YOUR ARTICLE marks the first time I have seen *MacUser* promulgate genuinely *bad* advice for graphic designers who want to make the transition from print to digital media. While offering some useful advice, your article points readers in the wrong direction.

It's important to realize that a page's appearance shouldn't be so "cool" that the page is illegible, but striking visuals are essential to having your pages noticed at all. A page lauded as visually striking will be linked, hence read, far more often than a plain, conservative, legible page that no one bothers to look at.

Worse yet is the advocacy of Adobe Acrobat. Although Acrobat offers designers an easy and familiar method for producing pages, PDF files are large and unwieldy and are often ignored by users who will direct their pointer to the Stop button if a page hasn't loaded in 30 seconds. The species of designers who put their own convenience in designing a page ahead of users' convenience in loading it is already extinct.

Most egregiously, you advise users, "Don't bother learning HTML codes," which is essentially advocating professional suicide. Although there's a wide array of applications that provide an intuitive interface for Web-page designers who want to avoid having to hard-code their documents, few of the applications are current with HTML standards, not to mention the constantly expanding array of extensions. Furthermore, although they are suitable for creating pages, they are generally useless for making alterations to existing ones. Until HTML tools are up to snuff, designers will simply *have* to be able to understand HTML in order to manually perform alterations that HTML-editing applications regularly bungle.

Finally, the authors blatantly ignored the most important requisite: a thorough knowledge of the medium. Articles that offer a don't-worry-about-learning-anything-new approach do nothing at all to help professionals prepare themselves for handling a dramatic transition from one medium to another.

J. Shamlin
jshamlin@aol.com

/ What we meant was that people should think, computers should work. It's true that today there are some jobs that can be done only by mucking with raw HTML, and if you want to do those, you have to code them by hand. But as HTML evolves, so do HTML editors. And one day Real Soon Now, there will be absolutely no need to write HTML code by hand. After all, do you hand-code PostScript to get it to print well?

Publishing is about communication, not coding. Because the tools are in their infancy, it is sometimes necessary to handcraft HTML, the way we used to hand-tweak compiled code in assembly language. That doesn't make it desirable or right. Our expectations for the Web are a lot higher than the current state of the "art."

Acrobat files can indeed take a long time to download, something being addressed by Adobe and Netscape. And we're pleased with the recent announcement that Netscape, Adobe, and Apple are cooperating on a standard for embedding fonts in Web pages, which will enhance the design possibilities within HTML. For absolute visual fidelity to the original design, though, you can't beat PDF.

The beauty of the Web comes from its interactive potential and the wonderful depth that arises from hypermedia — not from the medium's graphic-design capabilities. At least, not yet. Anyone for HTML 4.0? / BS & CW

Power Praise

I LOVED YOUR ARTICLE on Power Computing's PowerCurve line ("Power Throws Apple a Curve," March '96, page 27). However, you failed to notice possibly the greatest improvement over Apple's machines: The PowerCurves include a software bundle worth almost $1,000!

Congratulations to Power Computing for besting Apple once again.

Sergio Salvatore
via the Internet

YOUR REVIEW OF Power Computing's PowerWave machines (March '96, page 41) gave the 120-MHz version only 3.5 mice, whereas the 132- and 150-MHz versions got 4 mice. Isn't the 120-MHz version merely a slightly slower sibling? What was it about the machine that earned your disfavor?

Guy B. Purcell
purcell@crux.astr.ua.edu

/ As we stated, the PowerWave 604/120, which is more of a direct competitor to the Power Mac 7500 and 8500, has no digital-video capability, nor (at press time) did Power offer any digital-video option. This made Apple's offerings in this price range more compelling and Power's less so. / HB

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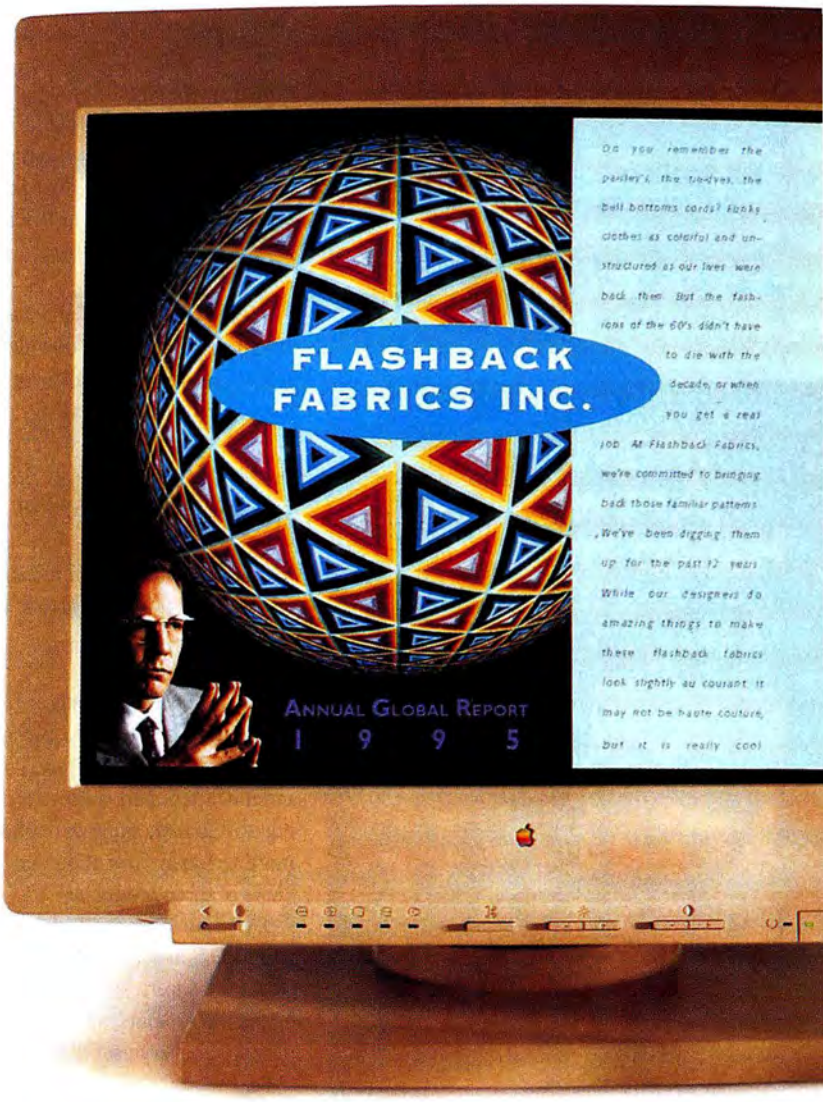

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LETTERS

We're Doomed

YOUR FOUR-MOUSE REVIEW of Doom II (The Game Room, March '96, page 138) seems truly unwarranted. The Doom II packaging claims that the program has an "Integrated Macintosh Interface with customizable keys, standard Mac menu commands and other options." But the "customizable" keys are simply three preset keyboard groupings. Additionally, I know of no other Mac applications that have you hold down keys on startup in order to access specific options of the game.

I enjoy playing Doom II on the PC and expected to like it even more on my Mac, but without the configuration flexibility or the command-line features (such as timers), the Mac experience was less than enjoyable.

Todd Clayton
tclayton@norden1.com

/ We agree that the lack of customizable keys and having to hold down keys during program launch are inconveniences. (That's partly why this game didn't get 4.5 or 5 mice.) But what's really important is how fun a game is to play. Despite its minor flaws, Doom II is a blast. / BL

YOU STATED THAT a shareware version of Doom was available for download and play on the Mac. I've looked all over and have not found anything that fits this description.

Could you clarify this a little?

Andy Champagne
andy.champagne@the-spa.com

/ The shareware version of Doom can be found throughout the online world, including at /game/arc/doom-i-101.hqx in any Info-Mac archive. / JS

Fair Share

NOW THAT MANY people are members of an online service, more people are exposed to shareware than ever before. With Macs costing much less and commercial software being so bloated, shareware should be taken more seriously. How about having regular reviews of these products?

There is a lot of good, inexpensive stuff out there, but it needs to be sorted through. There are screen savers, enhanced note pads, scrapbooks, PIMs, fonts, and plenty of little utilities that are very useful!

Dennis Varza
via the Internet

/ You're absolutely right. That's why we've recently inaugurated a MacUser shareware library on the Internet and America Online, to complement our existing library on CompuServe. In the library, we'll offer regular mouse-rated reviews of the best in shareware. You can find the library through the MacUser home page (http://www.zdnet.com/macuser/), on AOL at Keyword ZDNET, and on CompuServe at GO ZMC:ZMACARTS and GO ZMC:ZMACTECH. / JS

Eddy Rebuttals

I WAS VERY DISAPPOINTED to see that you named Iomega's Zip drive Hardware Product of the Year and Best New Personal Storage Product ("The Eleventh Annual Editors' Choice Awards," March '96, page 85).

SyQuest's EZ135 Drive would have been a much better choice in both categories. The EZ135 costs under $240, which is about 20 percent higher than the Zip drive. But for this small premium, it offers 35 percent more storage space. And it is just about twice as fast, making it a viable option even as online storage, something that would be fairly inconvenient with the Zip drive, due to its lack of speed. EZ and Zip cartridges cost the same, so in time, the advantage of the EZ is even clearer.

Gary Csorgo
raver@u.washington.edu

I MUST DISAGREE with your selection of Quicken Deluxe 6 CD-ROM for Macintosh as the Personal Organizer of the Year. It's an unstable piece of software — freezes and crashes are common. CheckFree is only partially implemented. Intuit's online support is atrocious. Documentation for the CD-ROM version is available in electronic form, but a printed manual costs extra.

Finally, Quicken is the only program this year's version of MacInTax will accept imported tax data from. This isn't a software problem, but it annoys me that software I've used to export to MacInTax for years is now incompatible, which has to be from a conscious decision on Intuit's part.

If the product performed as advertised, I'd be happy. It doesn't.

Phil O'Neill
via the Internet

DeskJet Upset

I WAS SURPRISED to see you give a 4.5-mouse rating to the Hewlett-Packard DeskJet 850C (March '96, page 55). Having always respected HP's reputation for high-quality products, I decided to buy a DeskJet 850C. The first one I bought stopped working after printing one document. The second one did not work at all. The third had problems when printing black text. The text was missing lines

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Mark Hall
Editor in Chief
Macweek
July 24, 1995

"Canvas 5 sports a sleek interface that packs the power of numerous programs without confusing the user...Canvas equals Adobe Illustrator and Macromedia FreeHand ... Although it doesn't offer all the bells and whistles of Adobe Photoshop, it does support a fairly complete array of tools for image editing, including masking."
Sean J. Salfeed
Senior Graphics Editor
MacUser Magazine
October, 1995

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Keith Boncek
Director of Computing
Cornell University
August, 1995

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2. Recognized that Picasso in the garage sale for $100 (it was last auctioned at $50 million).
3. Bought Canvas at $149 and got a free upgrade (saved thousands).

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AUGUST

WEB AUTHORING TOOLS

When it comes to building a Web site, it's important to use the best tools. So, don't build yours until you read MacUser's guide to the best products for creating and managing a Web site. The editors review and mouse-rate all the products, from word processors to text editors to management tools. If you want your business to profit from a Web presence, you'll profit from this issue.

MEET APPLE'S SYSTEM 7.5.3

Get to know Apple's new System 7.5.3 up close and personal. In the August issue of MacUser, the editors explain how it works and how this version differs from the last. They'll make sense of those mystifying system folder files that come with System 7.5.3. Find out which ones are necessary and which ones are expendable. The more you know about your system software, the more you'll be in control of your system.

CGI MAKES THE WEB CONNECTION

CGI (Common Gateway Interface) is a technology that can make a big difference in Web site development. This August in the Networking section, MacUser explores the advantages and drawbacks of this technology and who can benefit most from using it. More specifically, the editors look at how to use a CGI to provide FileMaker Pro information to people accessing your Web site.

AUGUST AD CLOSE:
MONDAY
MAY 20, 1996

or dots in the characters, similar to when the cartridge runs out of ink. I tried all of HP's troubleshooting tips and was not successful. I've printed several test pages from many 850C machines in many stores, and all have had the same problem with text.

I am very disappointed with Hewlett-Packard and have since purchased an Epson Stylus Color II printer, which works very well.

Edward R. Wehbe
ewehbe@aol.com

ALTHOUGH I CURRENTLY own and use a Hewlett-Packard DeskJet 850-series printer, I cannot agree with its 4.5-mouse rating.

When I bought the printer, its driver was incompatible with my Power Mac 8500. After several weeks, a new driver arrived, and now the printer works, but HP's background-printing software has the annoying habit of trying to eat up all of my 16 megabytes of RAM and often freezes my Mac. Your review failed to take into account HP's lackluster Mac support and software. This alone should have reduced the mouse rating.

Michael Conwell
mbcwam@anet-stl.com

Stop the Presses!

YOUR ADDITION OF *MacWEEK* breaking news (March '96, page 35) — just like what you offer on your MacUserWeb page on the Internet — is one of the best ideas I've seen yet. I hope this section becomes as regular as the Letters section, and I also hope you keep having all those good ideas.

Keep up the good work, guys!

Jorge H. Padilla Leal
jpadilla@raza.giga.com

Antidotal Evidence

FAR BE IT FOR ME to correct Bob and Chris (although I will be bragging to my friends about this), but I would at least like to *amend* a comment made in the March '96 Help Folder (page 129).

In the section about virus-protection applications, they say that Disinfectant's "antidotes are just as good as those of the commercial products." Although Disinfectant is indeed an excellent program, it doesn't quite live up to that claim: Disinfectant does not find HyperCard-based viruses.

A minor correction, I admit, but these guys make so few errors that you have to take advantage of it when you can.

S. M. King
sking@direct.ca

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MacUser ★★★★★ NOVEMBER 1994 MacWEEK ★★★★ AUGUST 1994

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MacUser January 1995

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CE SOFTWARE

Look into My Eyes . . .

I WAS THRILLED by the introduction of the Sleep mode in the new PCI-based Power Macs (heralded by all the Energy Star stickers on the box), but I was quite disappointed to find out that the Sleep mode didn't give me a silent desktop Mac, since the fan continues working.

By using a watt meter, I discovered that putting my new Power Mac 8500 to sleep did not reduce my power consumption by a single watt! According to Apple, the Sleep mode of the 8500 does not put the CPU to rest or conserve energy consumed by the CPU — it's only supposed to turn off hard drives and Energy Star-compliant monitors. But any Energy Star-compliant monitor sleeps and saves energy independently of the Mac. And putting a hard drive to sleep is not specific to the new PCI-based Macs (witness the shareware control panel Sleeper). So I have to wonder what the 8500's Sleep mode really does. Why mention it at all?

Apple should make the Sleep mode really mean something or stop selling it as an "energy saving" feature.

Claudio G. Frigerio
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The Right Choice

NEEDLESS TO SAY, there are a lot of ideas and theories flying around right now about why Apple is in its current state of distress. One of these ideas is that the company approached licensing at a far too conservative pace. Many even believe that Apple should have licensed the Mac OS years ago.

In my humble opinion, I think Apple has done a good job of maintaining its product integrity by controlling licensing. For years, PC lovers have gloated about the wealth of suppliers and manufacturers for their computers. But there's another side to the story: the hundreds of problems in a free-for-all market in which manufacturers and suppliers with proprietary technologies try to capture a niche but disappear from the face of the planet as soon as trouble arises.

Apple has definitely made some good choices in licensing the Mac OS to financially stable firms with a definite commitment to the "Mac culture." If it had indiscriminately let the Mac OS go to all takers, I strongly doubt that all the Macintosh-compatibles would be able to boast "100-percent Mac compatibility" like the current ones do. There really is something special about the Macintosh, and I hope that Apple continues to protect it.

Kingston Lam
kklam@asu.edu

Columnist Hunt

I'M GLAD YOU MOVED Andy Ihnatko to the back page. He deserves the spot. His editorial is consistently my favorite section of the magazine. Please pass along my congrats to Andy: Keep on doing "that voodoo that you do so well."

My only (very mild) gripe: You've made me give up the "Where's Andy?" game I used to play when a new issue arrived. I mean, even a Windows user can find the back page on the first try. I'll have to find some other game for putting off getting back to work.

Kerin Schiesser
kerin@ljworld.com

Corrections

The name of Corbis Publishing's fine-art CD-ROM should have been listed as Paul Cézanne: Portrait of My World (News, March '96, page 29).

The price for the Koss JR/900 RF Cordless Stereophone should have been listed as $399 (News, April '96, page 29).

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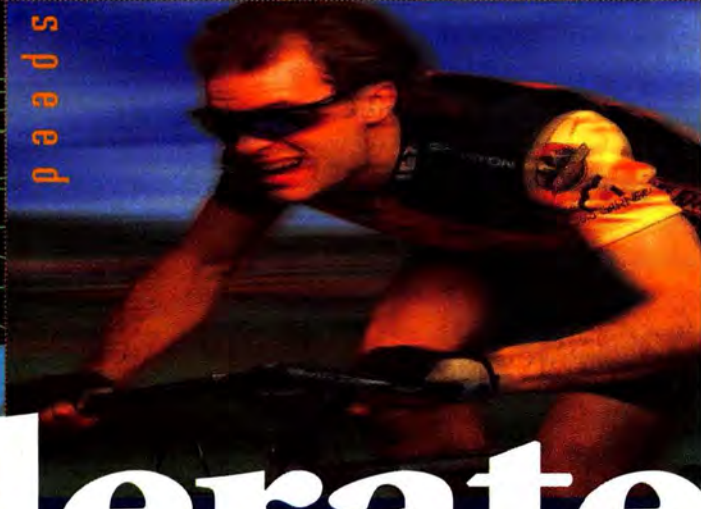

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MacBench 3.0 publishing graphics mix test performed on Power Mac 9500/132 with 40MB of RAM @ 1152 x 870 in 16.7 million colors with Matrox Millennium for PCI Power Mac, Number Nine Imagine 128, IMS Twin Turbo 128 and Radius Thunder 30/1600.

CIRCLE **94** ON READER SERVICE CARD

PAMELA PFIFFNER

Where Have All the Titles Gone?

WHEN'S THE LAST TIME you strolled into a computer retail store to buy a Mac application? Pretty bleak, huh? You probably saw shelves loaded with software designed for Windows 95. If there was any Mac software at all, it was probably consigned to a small section of the store, hidden away as if its very presence were an afterthought. These days, even the "hybrid" CD-ROMs, which run on PCs *and* Macs (but can be found *only* in the Windows section) are plastered with flashy "Runs on Windows 95!" stickers.

The so-called mainstream channels are even worse. In a recent trip to my local discount warehouse, I began to panic. No longer was there a clearly marked Macintosh section. As I circled the table, anxiously scanning for Mac titles, I saw hundreds of copies of Microsoft Windows 95 (joining Michael Jackson's *HIStory* as the most overhyped and undersold package of 1995) and stacks of personal-finance packages, adventure games, and 20-pack CD-ROM collections (Just $19.95!) — all for Windows systems. Finally, mixed in among the Windows tax-preparation programs, I found a few copies of Intuit's MacInTax. Then I scrounged around and turned up a couple of PowerPC-native shoot-'em-up games and Casady & Greene's Conflict Catcher 3, the only mainstream Mac product in this paltry lot.

No wonder there's a perception that developers are abandoning the Mac OS and flocking to Windows. That's where all the sales are, right? The Wintel platform, with its 85-percent market share, is where developers can make scads of money, yessiree. Never mind that the Mac is easier to develop for and that Mac margins are high enough that developers have a chance of actually recouping development dollars.

A developer told me recently that the reason his company's new whiz-bang game was coming out on Windows first was due to failed expectations with an earlier Mac title. It seems the distributor told him not to make a hybrid CD-ROM, which would inevitably be placed in the Windows section of the store, but to instead cut a separate Mac package. The developer complied, expecting decent orders for both platforms. But the Mac boxes just sat in the warehouse. During the skittish holiday season, no dealers wanted to order Mac-only units for fear of mounting inventory.

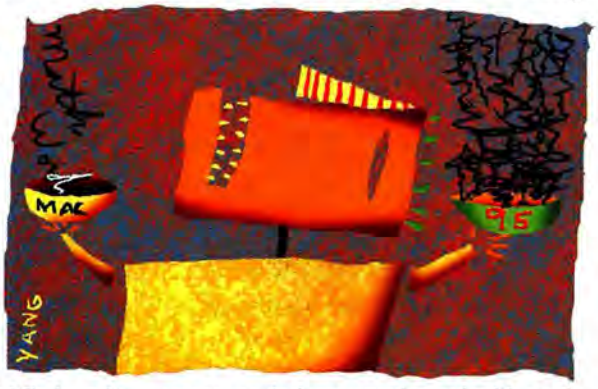

ILLUSTRATION / JAMES YANG

Why don't stores have a section for products that run on both platforms? Why don't developers come up with an equally flashy sticker proclaiming "Runs on Macs" for hybrid CD-ROMs? These are just some of the questions facing Heidi Roizen, Apple's new Vice President of Developer Relations.

Roizen to the Rescue?

Apple hired Roizen after she told the company why she *wouldn't* take the job, based on her own 13 years as the CEO of Mac-software company T/Maker and on her stint as an officer of the Software Publishers Association. As one of the original developers for the Mac, Roizen has weathered many a storm and knows firsthand what it's like to work with Apple.

But some developers are concerned that Roizen's experience is exactly why she *isn't* right for the job. T/Maker struggled for years to develop and market the word processor WriteNow (which was eventually acquired by WordStar), but the company, which Roizen sold in 1994, is mostly known for its clip art. Clip art is based on a static file format, they say; she doesn't know what it's like to deal with the operating system's dynamic code. And with a new OS looming on the horizon, these concerns seem legitimate. Be warned: Copland will break just about everything, so users and developers alike will have to start from scratch in many instances.

Whether or not Roizen's the best person for the job seems moot at this point. What matters is that she's here. Much of Roizen's job amounts to public relations. She must battle the perception that the Mac is no longer a vital platform for developers. Roizen has articulated a common-sense plan that includes spreading the developer gospel throughout Apple, from CEO down; raiding the Wintel developer community for potential new Mac products; working closely with top Mac developers to make sure they get what they need; and convincing the retail channel to promote Mac products.

But she has a formidable task ahead of her. Slapping on stickers and co-opting shelf space is only window dressing for more-profound problems, as Roizen is certainly aware. Apple must convince developers that it understands their problems and has a battle plan to combat shrinking Mac-software sales. Given that Apple has said that it plans to focus on key markets such as education, graphics, and multimedia, developers who don't fit into those tidy categories are bound to feel somewhat alienated.

A good time to take the temperature of these vendors is at Apple's Worldwide Developers Conference in May. This year, it'll be a meeting of the best, the brightest, and the beleaguered. (To attend, vendors have to cough up a thousand bucks per engineer. Perhaps Apple's first step in wooing developers should have been a steep discount.) It'll also be a party. Apple may not have a whole lot to celebrate this year, but let's hope that it, like any party host, listens to its guests.

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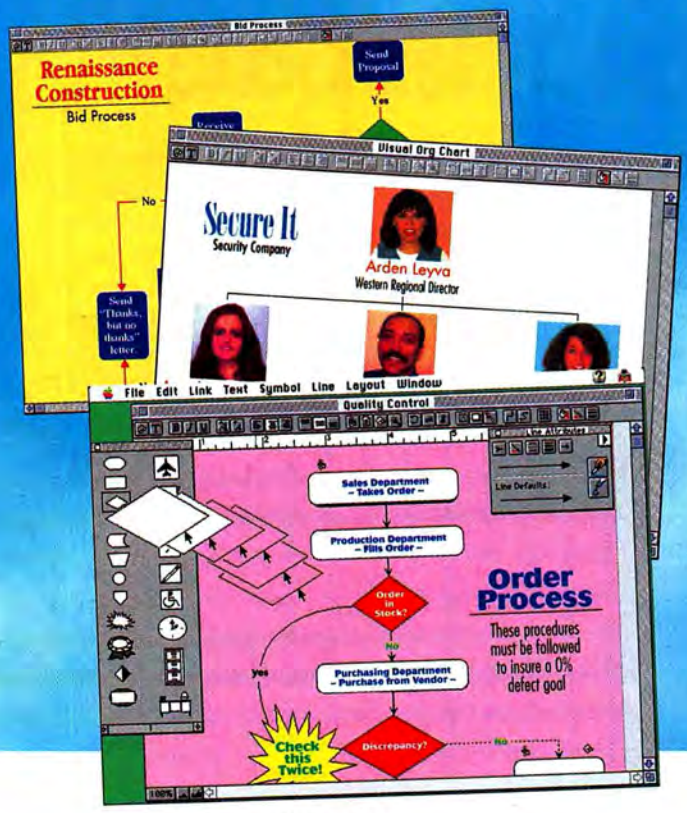

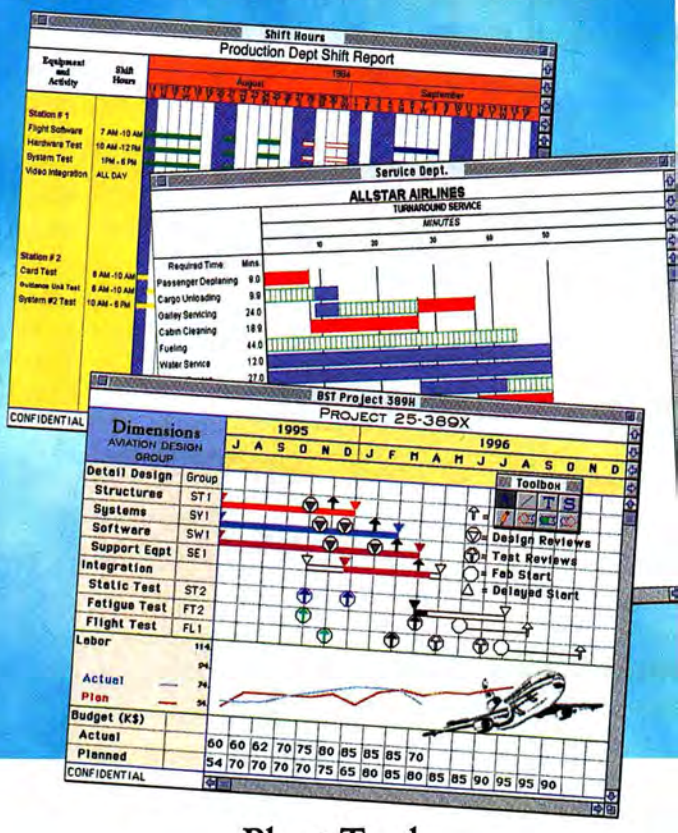

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NEWS

PC Graphics Giant Moves to Mac

Corel announces the long-awaited CorelDRAW 6.0 for Power Macintosh.

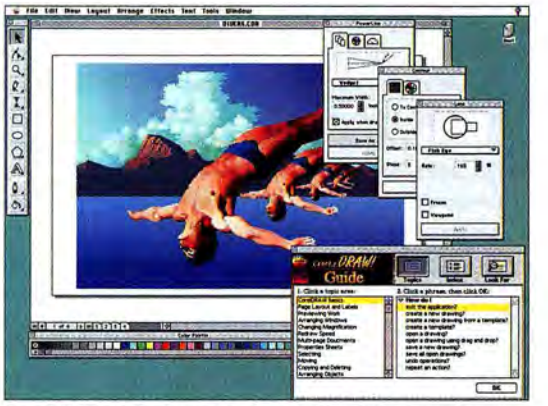
CONVENTIONAL WISDOM has it that all the smart application-development money is moving to the Windows side of the desktop-computing world. Someone apparently forgot to tell Corel, the 900-pound gorilla of the PC graphics arena. Not only did the Ottawa-based software giant recently rescue the *MacUser* Eddy Award-winning WordPerfect word processor from the inattention of Novell but it also announced that its first Mac graphics product — promised over two years ago — would finally ship this summer.

Apparently these wily Canadians have concluded that there's money to be made in the $13 billion Mac-dominated U.S. publishing industry. Corel is betting that Mac users will jump to its new suite of graphics tools, collectively named CorelDRAW 6.0 for Power Macintosh. Users get a complete set of graphics tools, including CorelDRAW 6.0, for illustration; CorelDREAM 3D, for 3-D modeling; CorelTRACE 6, for bitmap-to-vector conversion; and paint and texture-creation applications.

CorelDRAW 6.0 plans to take on Adobe Illustrator and Macromedia FreeHand with a host of illustration tools. The package features standard Bézier-editing and text-handling tools; multicolor gradients; bitmap and PostScript-based texture fills; and Boolean tools for trimming, welding, and intersecting shapes.

Lens effects let you create fish-eye distortions similar to those of the Spherize filter in Photoshop. A variety of special effects create 3-D shapes and complex distortions. Bending text is easy with a tool that wraps objects inside a Bézier shape. You can even create pseudo-3-D effects, using the perspective tool. Adobe Photoshop and Illustrator filters are not supported.

CorelDRAW 6.0 also addresses prepress needs with support for soft proofing of images. Color matching is supported through two methods: You can choose colors from either the Pantone, Trumatch, Focoltone, Toyo, SpectraMaster, or DIC color models, or you can use Corel's Color Matching Wizard to achieve closer matching. There is also support for OPI (Open Prepress Interface).



CorelDRAW 6.0 for Power Macintosh offers help through Apple Guide and a host of tools in a comfortable, Mac-savvy interface.

Corel took some pains to be a good Mac citizen — and a preliminary look indicates that it may have succeeded. CorelDRAW supports the Apple Guide help system; ColorSync 2.0, for color matching; and scripting through AppleScript — features that put Corel ahead of Adobe and Macromedia in supporting Apple technologies.

CorelDRAW may support the leading Apple technologies, but we suspect that other parts of the package may offer less support for them — CorelDREAM 3D, for example, is a licensed version of Ray Dream Designer, which doesn't support Apple Guide or AppleScript.

Utilities include Corel Multimedia Manager, which lets you browse through clip art and photos. In addition, like its Windows counterpart, CorelDRAW 6.0 includes 25,000 pieces of vector clip art, 1,000 photographs from the Corel Professional Photos collection, and 1,000 fonts in TrueType and Type 1 format. The price was not set at press time, but expect CorelDRAW 6.0 to be priced competitively with Adobe Illustrator and Macromedia FreeHand, which each list for around $600. 800-772-6735 or 613-728-3733; http://www.corelnet.com/. / *SEAN J. SAFREED*

FUTURE TECH

Pantone Puts a Hex on Color Publishing

THE TROUBLE WITH COLOR is that there isn't enough of it — not in the inks of a traditional four-color press. Real-world colors are far brighter, richer, and more varied than those created by the cyan, magenta, yellow, and black inks used by your desktop printer or a four-color printing press.

Last year, color-printing leader Pantone offered its solution to the limited color *gamut*, or range, of four-color printing: Hexachrome — a six-color system that adds a bright orange and intensified green to tweaked versions of the familiar CMYK quartet. This year, professional color-application developers are rallying 'round the new system. Next year, expect your world to be a little brighter, as high-quality Hexachrome-printed materials start to crop up everywhere.

The Hexachrome system creates a color gamut well beyond that of traditional printing — even beyond that of your color monitor. This results not only in richer colors but also in reduced need for spot-color press runs. To prepare images for a six-color press run, Pantone provides HexWrench, a Hexachrome-compatible color-separation plug-in for Adobe Photoshop. To aid in color consistency among applications, Pantone offers ColorDrive 1.5 color-palette management software.

Adobe includes Hexachrome support in PageMaker 6.0. Quark has announced support for Hexachrome in future products, including its flagship, QuarkXPress. Six-color desktop proofing devices are under development by major printer manufacturers — tiny Colossal Graphics, of Palo Alto, California, already has prototypes of Hexachrome-compatible inkjet printers up and running.

Expect all the major color-publishing players to offer Hexachrome support in the months to come. The printed page will be a brighter place because of it. 800-222-1149 or 201-935-5500; http://www.pantone.com/. / *RIK MYSLEWSKI*

[*More information on Hexachrome can be found on MacUserWeb, http://www.zdnet.com/macuser/, beginning April 19. — Ed.*]

Superheroes for the Superhighway

Apple's new Internet servers improve Web-site performance.

BETTER LATE THAN NEVER may be Apple's Internet motto. While enterprising developers such as StarNine were helping equally enterprising Webmasters kick-start the Mac onto the Internet, Apple itself was taking its own sweet time merging onto the Infobahn.

But if recent announcements — and rumors — are any indication, both Apple and its cochallenger of Microsoft, Netscape, have decided to fight Bill Gates' plans to turn the Infobahn into a Microsoft toll road. Witness, for example, the recent rumblings from Cupertino think tanks about using Apple's Cyberdog technology to make the upcoming Copland OS more "Internet-centric."

More concrete, however, is Apple's recent revitalization of the Apple Internet Server Solution for the World Wide Web. Not only has the name been mercifully shortened to Apple Internet Server Solution 2.0 but speed and software have also been greatly enhanced. Three new servers, based on the Workgroup Servers 6150/66, 7250/120, and 8550/132, include over $4,000 of state-of-the-art Web-site-creation and -management software — for $2,299, $3,299, and $6,449, respectively.

The key to the speed of an Internet Server Solution 2.0 system — it's over 300 percent faster than any previous model, according to Apple — is Open Transport 1.1, working in tandem with WebSTAR, from StarNine, a Quarterdeck company. And although WebSTAR 1.2.5 may be the flagship of the Internet Server Solution 2.0 software bundle, it's joined by some heavyweights: PageMill 1.0 and Acrobat Pro 2.1, from Adobe; BBEdit 3.5.2, from Bare Bones Software; RealAudio Server 1.0, from Progressive Networks; and a dozen more professional site-creation and -management tools.

But if even an Internet Server Solution 2.0 isn't muscular enough for you and you still want to keep that little multicolored apple in your server closet, you can invest $10,000 to $25,000 in Apple's new AIX-based Network Server 500 or 700 and install Netscape's recently announced SuiteSpot, a collection of Web-page-delivery, messaging, directory, and collaborative-computing servers. The bad news is that you'll leave the comfortable world of the Mac OS, and you'll shell out thousands more for software (prices vary by configuration). Apple: 800-538-9696; http://www.solutions.apple.com/internet/. Netscape: 415-528-2555; http://www.netscape.com. / *RIK MYSLEWSKI*

MACUSER UTILITY OF THE MONTH

Thanks for the Memory

CRAM MORE INTO RAM with MacUser's RAM Handler. This tiny application displays all your memory's vital signs while giving you more control over how much RAM your applications gobble up. One click compresses and purges the wasted memory allocated to any running application or optimizes all your free memory. Just throw MacUser's RAM Handler into your startup folder; its small window updates behind your current application and can be minimized to take up only an icon's worth of screen space.

Created by Mike Throckmorton, MacUser's RAM Handler is available exclusively from ZD Net/Mac on CompuServe (GO ZMC:MACUSER) and on the Web at http://www.zdnet.com/macuser/. Look for it April 30th. / *SCOTT LOVE*

The $20,000 Bargain Scanner

THINK BATMOBILE: The Eurocore Hi Scan is the drum scanner Bruce Wayne would choose for his desktop. Its most remarkable feature, however, is its relatively low cost: Although it scans in 36-bit color at up to 10,000 dpi, its $19,500 price tag is comparable to that of ScanView's 3,000-dpi desktop drum scanner and is less than half that of ultrahigh-resolution drum scanners such as ScanView's $49,995 11,000-dpi ScanMate 11000.

On the other hand, the 8-inch-wide and 17.5-inch-long and -tall Hi Scan can scan reflective images or transparencies only up to the odd size of 6 x 12 inches. The Hi Scan ships with its own proprietary software with preview, batch-scanning, and color-matching features. Distributed by Scantron, 310-644-8585. / *CAROLYN BICKFORD*

MetaTools Creates a Brave New World

THE ORIGINAL BRYCE landscape-creation tool captivated artists who wanted to create images as realistic as those found in big-budget science-fiction movies. Its sequel, KPT Bryce 2, offers a real-time terrain-sculpting tool; extends the interface of the original with glowing buttons and "plop-up" menus; and includes hundreds of preset terrains, textures, materials, and objects.

When you launch Bryce 2, the new interface takes over the entire screen, including the menu bar. A tool bar shows the available 3-D primitives, and navigation buttons let you pan, dolly, and bank the camera. All the buttons glow to show the currently active tool. Within the main view window, combinations of command keys and a click bring up small plop-up menus — for inputting numerical data, for example.

It's a rare application that can create its own interface. Bryce 2 sports 3-D buttons that glow and pulsate — each created in Bryce 2.

Users can watch as Bryce 2's new Terrain Editor redraws 3-D previews of mountains or other terrains in real time. You can edit the shapes by using painting tools to brush in peaks or valleys. The new editor should vastly speed up the landscape-creation process.

To aid in scene creation, Bryce now offers hundreds of presets for objects such as clouds and trees, and surfaces that mimic water. New point and distant lights as well as spotlights and slide projectors give you flexibility for lighting your scene. You can import 3-D objects from programs that export DXF files. Sorry, Apple's 3DMF format is not yet supported.

The price for the new version, $299, is triple the original's $99. An upgrade is $99. 805-566-6200; http://www.metatools.com/. / *SEAN J. SAFREED*

CLONE WATCH

Prices Dive, Options Increase

Major clone vendors pressure Apple by slashing prices and introducing multiprocessor upgrades.

NOTHING LASTS forever in this business, especially the price of clones. Both Power Computing and DayStar Digital recently announced significant price cuts in their Mac OS-compatible lines. Look out, Dr. Amelio — Apple's already dangerously slim margins are under even more pressure.

On the low end of the price spectrum, Power Computing chopped prices on its PowerWave and PowerCurve models by as much as 22 percent, although the cuts on some models were less impressive. The steepest reduction was on the PowerWave 604/120: A 16/1GB/CD configuration came down from $3,199 all the way to $2,480. PowerWave 604/150s dropped by around 15 percent. Curiously, though, the PowerWave 604/132 was reduced only $200, from $3,699 (16/1GB/CD) to $3,499, and the PowerCurve 601/120 (8/150/no CD) was cut by only a measly 50 bucks, from $1,849 to $1,799.

Over on the tonier side of town, DayStar's multiprocessor Genesis MP 600 is now a bit more in reach of the damn-the-cost-I-need-speed crowd. The list (direct from DayStar) price of this quad-604/150 speedster has dropped from $20,000 to $17,499, a 13-percent reduction. The list price of a Genesis MP 528 (four 604/132 processors) has dropped from $15,000 to $13,499. Dealer pricing averages around 10 to 15 percent below list.

If you've already got a Power Mac 7500, 8500, or 9500 and want to convert your system to a four-processor Genesis MP, there is now an alternative for you as well. For $7,500 (list) you can purchase a quad-604/132 upgrade kit (which includes a new chassis and power supply as well as DayStar's new multiprocessor daughtercard) for a 7500 or an 8500. The 9500 conversion kit lists for $8,500.

If four processors are a bit more than you've budgeted for, DayStar's upcoming nPOWER dual-processor upgrade card, under $3,000, may be your ticket to multiprocessor power. This will be the first dual-processor upgrade card available from any source. / *HENRY BORTMAN*

QuickTime Hits the Big Time

EXCITING TECHNOLOGIES abound in version 2.2 of Apple's QuickTime extension. Users and developers alike will want to upgrade to this version and benefit from MPEG-1 support, QuickDraw 3D integration, MIDI enhancements, multiprocessor support, and QuickTime and QuickTime VR plug-ins for Netscape 2.0.

No longer will you have to suffer the dithering artifacts and low detail of CinePak-compressed QuickTime movies. For Power Mac users, QuickTime 2.2 delivers software-MPEG playback. On a system that has a 100-MHz PowerPC 601 or 603, MPEG-1 files play back at 15 frames per second with CD-quality sound. Thanks to pixel doubling, MPEG movies can play back at full-screen resolution without additional hardware. QuickTime 2.2 also has beefed-up MIDI support: It supports 16-bit playback of MIDI files, and users can plug in MIDI instrument libraries from third parties such as Invision, Roland, and Yamaha. QuickDraw 3D objects, such as text and sprites, can have their own tracks in QuickTime 2.2.

QuickTime 2.2 also supports the multiple processors in clones such as those in the DayStar Genesis line. Finally, your Mac can be the life of the party: QuickTime 2.2 plays karaoke MIDI, with lyrics highlighted in the movie window as the music plays. / *SEAN J. SAFREED*

ILLUSTRATION / MARGARET MCMULLIN

New Uses for New Newton

THE LATEST INCARNATION of Apple's resurgent Newton, the $799 MessagePad 130, includes improvements such as backlighting and a megabyte of system memory. The best news, however, is the arrival of applications that take advantage of the Newton 2.0 operating system: Client software for America Online, CompuServe, CE Software's QuickMail, Qualcomm's Eudora, and Lotus Notes integrates directly into Newton 2.0's Universal In/Out box. Come July, Apple expects to deliver its Newton Internet Enabler TCP/IP stack.

PowerBook and MessagePad infrared transceivers are still incompatible, and Apple has yet to ship Newton Connection Utilities, which lets you create, edit, import, and export Newton data. It was scheduled for January; Apple now promises it this spring. Currently, you can sync Newton data with your Mac's only via application-specific utilities such as Intuit's Pocket Quicken for Newton 2.0, Symantec's ACT for the Newton, and Claris' FileMaker Pro 3.0 Companion. Text and bitmapped graphics can also be exported in Newton Book format, using Apple's $69 Newton Press. 800-538-9696 or 408-996-1010; http://www.info.apple.com/newton. / *CAROLYN BICKFORD*

Late QuickMail Upgrade: The Map Is Not the Terrain

DESPITE HAVING A MAP handy, CE Software has swerved from the course it set for QuickMail last year. When CE released QuickMail 3.5 in mid-1995, it also published the QuickMail Product Roadmap, which laid out plans for versions 3.7 and 4.0. Version 3.7, the plan said, would be ready by the end of 1995, with the 4.0 release scheduled to debut this summer. Instead, CE has just released QuickMail 3.6 (including its first PowerPC-native client software); another upgrade, in June, will add many — but not all — of the features promised in the road map.

QuickMail 3.6 boasts improved address-book and Internet-e-mail-address management. The sizes of QuickMail enclosures are now displayed, and QuickSend is back — this utility, missing from QuickMail for several years, allows users to send e-mail messages from within other applications.

Subscribers to CE's upgrade program will receive QuickMail 3.6 (as well as the June release) free. Prices for upgrades from QuickMail 3.0 and earlier versions range from $3 to $19.25 per user. 800-523-7638 or 515-221-1801; http://www.cesoft.com/. / *SHELLY BRISBIN*

The Geek Beat

NETWORKING. Version 2.5 of FileWave ($496 for ten users), from Wave Research, automates distribution of applications or system-software upgrades to large groups of users. If a transfer is interrupted, FileWave will complete it once the user's machine has returned to the network. 510-704-3900; http://www.waveresearch.com/wave/.

Power On Software's Net Commander ($29 to $69 per user) also distributes software to multiple users and provides administrators with control over networked Macs, including the ability to lock keyboards, synchronize clocks, and shut down machines. 800-344-9160 or 216-735-3116.

INTERNET. Chameleon for Macintosh ($295), NetManage's Internet suite, speaks both WinSock and Open Transport. It also includes a Web browser, terminal emulation, and PPP-based remote access. A $250 WinSock development kit will ease porting of Windows-based Internet applications to the Mac. 408-973-7171; http://www.netmanage.com/.

DEVELOPMENT TOOLS. Digitool is giving Dylan a new lease on life. Apple has contracted with Digitool to port the object-oriented programming language to the Power Mac version of Digitool's Macintosh Common Lisp. Dylan remains an Apple product. 617-441-5000; info@digitool.com.

EveryWare has added ODBC database support and new editing features to its Tango CGI (Common Gateway Interface). Tango ($495) allows Web developers to connect SQL (and now ODBC) databases to their Internet environments. 905-819-1173; http://www.everyware.com/.

CROSS-PLATFORM. Mac users who need to dance with IBM mainframes can pick up the pace with Wall Data's Mac RUMBA for the Mainframe ($275), which includes IBM 3270 emulation, printer sharing, and drag-and-drop FTP and which operates in TCP/IP, SNA, and NetWare environments. 800-915-9255 or 415-856-9255; http://www.walldata.com/.

UNIX. Apple is sponsoring an Open Software Foundation port of Linux, a freeware version of UNIX. Linux will be available for NuBus Power Macs. http://mklinux.apple.com. / *SHELLY BRISBIN*

Storage Milestone

Microtech first to offer high-speed, sharable SSA systems.

IMAGINE THE BENEFITS of storing all of your workgroup's files in one central location while increasing file-transfer speed from Ethernet's half-megabyte-per-second average to around 40 megabytes per second. Multiple workstations could be dedicated to shared projects without time-consuming network or removable-cartridge file-transfer bottlenecks. You'd save time; you'd save money.

Microtech has announced a storage-system line that promises to do just that. Its modular Crossroads systems, scheduled for release this spring, are based on high-speed SSA (*serial storage architecture*) technology and will allow up to 127 devices (drives and Macs equipped with SSA PCI cards) to connect to one file-sharing loop, with up to 20 meters of inexpensive serial cable between nodes and with no termination required.

All Macs will have equal and concurrent access to all drives — and all at speeds that Microtech claims will, in non-RAID configurations, approximate the speed of single-channel RAID 0 SCSI drives. What's more, Microtech claims that its early testing of RAID 0 SSA systems shows read rates of just under SSA's single-channel 40-megabyte-per-second limit. The future is even more promising: By late 1996, the theoretical limit of dual-channel SSA-bus speed may reach a scorching 160 megabytes per second.

The key to the Crossroads systems' versatility and speed is the Pathlight Technologies High Speed SSA Data Pump. Microtech will offer its ($1,000) version of this PCI card — which includes two SSA channels, for a combined maximum throughput of 80 megabytes per second — both separately and in Crossroads system bundles. Two- and four-gigabyte Crossroads drives, based on mechanisms from IBM, will also be sold both separately and in bundles — at prices comparable to those of Microtech's current BLUE line of SCSI drives. CharisMac is contributing the drivers as well as its CharisMac RAID software. 800-626-4276 or 203-468-6223; http://www.microtechint.com/. / *RIK MYSLEWSKI*

Microtech's Crossroads systems marry IBM's UltraStar drive (right) with Pathlight's SSA card.

NET.CETERA

Internet Font Fight

ONLINE PUBLISHERS are becoming frustrated with the limitations of HTML and are demanding more control over text in their documents. Relief is on the way, however, as several companies team up — and face off — in the effort to reduce typeface anarchy on the Web.

Not surprisingly, Web-domination contenders Microsoft and Netscape are the leading players in the fight to define type standards for the Internet. Microsoft's system, in which your Web browser would be sent TrueType fonts as needed, is being championed by such heavyweights as Hewlett-Packard and Macromedia. As might be expected, Microsoft says support for its technology will be built into a future version of its Internet Explorer browser.

In Netscape's corner are Adobe and Apple. Their proposal would let Web authors embed either TrueType or Type 1 PostScript fonts into their pages. Adobe developed the technology as part of Amber, the Web-oriented version of Acrobat, but says it can be used for text in HTML documents as well.

It's not easy to count out Microsoft, but its font-management proposal may be knocked cold even before the first bell has rung. Netscape will no doubt put its system into Netscape Navigator long before any standards organization has had a chance to bless either proposal, and the popularity of Navigator may be enough to cast the deciding vote. Furthermore, Netscape's standard enjoys the one-two punch of both major font formats whereas Microsoft's ignores the vast number of existing Type 1 fonts. / *JASON SNELL*

Color QuickCam

CUTE AND CONVENIENT just like its popular grayscale predecessor, the new Connectix Color QuickCam captures full-screen 24-bit-color still images as well as digital video at a faster frame rate than that of the original QuickCam. Other improvements include a timer, scheduled autocapture, and focus control — the microphone's gone, however. With an estimated street price of $229 — which translates to $199 after you figure in the $30 rebate being offered until July — the Color QuickCam may cost twice as much as its predecessor, but that's still a heck of a bargain among digital color cameras. 800-571-5100 or 415-571-5195; http://www.connectix.com/. / *CAROLYN BICKFORD*

Mac OS and Win 95 in Classroom Brawl

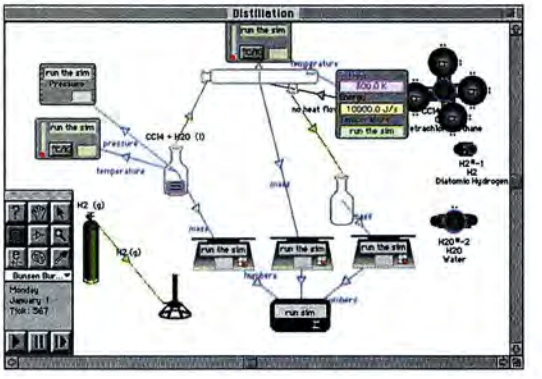
Developers hedge their bets during struggle for K – 12 market.

YOUR KIDS' SCHOOL is the latest battleground in the contest between Mac OS and Windows 95 systems. For years, the Mac's superior ease of use has made it the hands-down favorite in the education market. The advent of Windows 95, however, is causing some holders of K – 12 purse strings to rethink their dedication to the Mac — and developers of educational software are taking note.

It's hard to get a true picture of the state of the struggle. Apple cites a study that claims that 58 percent of planned computer purchases during this school year will be Macs; Compaq cites a different study that says that 60 percent of all computers purchased last year were Windows-based and that this year more PCs than Macs will be found in schools. That would be a tall order, given Apple's claim that 63 percent of all school computers are currently Macs.

No matter whose figures you believe, this ongoing war of words — and wallets — is persuading educational-software developers to release their latest efforts on both platforms and then let the schools decide which way to go. More important, however, is that kids seem to be the beneficiaries of this battle — the competition seems to be inspiring some developers to reach new heights of creativity.

For example, Salamander Interactive, founded by the author of Maxis' SimLife, is planning to migrate simulation technology from games to education — and it doesn't care whether your kids' school is filled with Macs or PCs. Its first product, Dynamic Chemistry (shown at right), is like a chemistry kit without the mess. Students create their own chemicals by bonding together chemical elements and set up their own chemistry labs with a variety of lab gear, including test tubes, Bunsen burners, condensers, thermometers, and scales. Although it lets kids explore on their own, it includes several step-by-step lessons that require them to conduct experiments and answer on-screen questions. Teachers can also write their own lessons for students. Distributed by Addison-Wesley, it should be available in academic bookstores, in Mac and Windows versions, for less than $50, beginning in late August. Salamander Interactive, 408-297-7387; Addison-Wesley, 415-854-0300, ext. 2489.



Cross-platform creativity is also Tenth Planet's goal — although the company is giving priority to the Mac. The first series of its new Tenth Planet Explores Primary Math is available now for the Mac — Windows-based classrooms will have to wait until August. Designed for first- through third-grade students, this series of activities teaches geometry concepts through instructive videos and animation. For example, the lesson on radiating patterns includes a story about Native American weaving. Teachers can reinforce each lesson with a classroom activity, and then students can write about the activity in an electronic journal the teacher can use to track each student's progress. Based on academic standards developed by a teacher council, each $250 educational unit covers approximately six weeks of instruction. Tenth Planet, 800-546-2317 or 415-726-5891; http://www.tenthplanet.com/. / *CAROLYN BICKFORD*

CD-ROMS

Games and Gags from Hit TV Shows

BRING A SHARP MIND and these TV-inspired discs to your Mac, and have fun plumbing the depths of your intellect — if you're somewhere between a genius and a complete moron.

CONNECTIONS. ▶ PBS institution James Burke hosts this game about the flow of industrial history. You seek to bring reason to a finely rendered universe ("the web") by finding the links between seemingly random *real* innovations and placing them in chronological order in the *surreal* web. Each time you find a connection and successfully place an item, Burke provides a video on its historical significance and moves you to the next level of play. Discovery Channel Multimedia. $50. 800-678-3343; http://multimedia.discovery.com/.

SATURDAY NIGHT LIVE GOES POLITICAL. With dozens of politically inspired video and audio clips from 20 years of *SNL* and 16 diversions such as a burger-chasing game that features Clinton eating his way to the White House, you might find SNLGP as hilarious as this year's presidential candidates. Berkeley Systems. $30. 800-344-5541 or 510-540-5535; http://www.berksys.com/.

THE YOU DON'T KNOW JACK QUESTION PACK. TV game shows migrated to the Mac in the *MacUser* Eddy Award-winning You Don't Know Jack CD-ROM game. But what do you do after you've answered the 800+ superhip trivia questions in the original and *still* want more? Berkeley Systems has responded to customer demand with a 400-question CD-ROM add-on. Also available is You Don't Know Jack X-tra Large, which is the original trivia game combined with the Question Pack. Berkeley Systems. Question Pack, $20; You Don't Know Jack X-tra Large, $40. 800-344-5541 or 510-540-5535; http://www.berksys.com/. / *REBECCA OLSON*

THE OFF BEAT

No More Sloppy Floppies

WHAT HOLDS 25 FLOPPIES, adds color to your office, *and* can make a bubble bath double the fun? A Diskits Desktop Diskeeper, of course. For around $15, you can get any one of six different durable foam Diskits: a shark, an alligator, a New York City or Hollywood cityscape, a mailbox, or a chunk of cheese. One warning: Be sure to remove all your floppies before you float your Diskits Desktop Diskeeper alongside your favorite rubber ducky. Ring King Visibles. 800-272-2366 or 319-263-8144. / *NANCY PETERSON*

PHOTOGRAPHY / MICHAEL FALCONER

NEW & NOTABLE

HARDWARE

▼ **BT Visual Images Portrait 9000.** You can either use this videophone as a stand-alone unit, or you can connect it to your Mac or PC. (It's designed primarily for use with a PowerBook or with a laptop computer.) If you connect it to a computer, you can use either the videophone's 6-inch display or the computer screen — or both simultaneously. $3,999. 800-778-6288 or 703-709-4281.

ACECAD ACECAT III. This third-generation, high-resolution 5-x-5-inch graphics tablet supports resolutions of up to 2,000 lines per inch, with an accuracy rate of ± .01 inch. The 1.2-pound device can easily sit on your desk, lap, or hand, for design tasks from digitizing to tracing and drawing. $129. 800-676-4223 or 408-655-1900.

Orange Micro OrangePC 200- and 400-Series Coprocessor PC System Boards. You can run Windows applications on your Mac, using one of these four coprocessor boards from Orange Micro. The boards feature either 486 or 5x86 processors, dedicated DRAM, and an L2 cache of up to 256K. Models include the 220 and 290 NuBus boards and the 420 and 440 PCI boards. $740 to $2,500. 714-779-2772 or http://www.orangemicro.com/.

Epson Personal Document Station. This compact 4-ppm document scanner claims to be a strong competitor to Visioneer's PaperPort Vx. It captures 8-bit 300-dpi grayscale images and includes image-enhancing features that rid documents of background colors and random markings and that separate text from images into appropriate grayscale or black-and-white formats. $399. 800-289-3776; http://www.epson.com/.

In Focus Systems LitePro 210 Multimedia Projector and PowerView 820 Multimedia Projection Panel. The LitePro 210 is an active-matrix projector with built-in JBL speakers for enhanced audio and is designed for ease of use and portability. The lightweight 800-x-600-pixel active-matrix PowerView 820 projection panel features smart image scaling. Both include a cleanly designed remote control and the CableWizard Connector System, a slick cable organizer. Projector, $5,499 (video and data option, $5,999); panel, $4,499 (video and data option, $4,999). 503-685-8888.

Plasmon Cheetah Series MO Drives. Available in single configurations or as jukeboxes, these 2.6-GB magneto-optical drives offer rotational speeds of 1,900 rpm (2.1 MB per second) in the case of the Cheetah and 3,600 rpm (4 MB per second) in the case of the Cheetah Plus. The jukeboxes have capacities of 52 GB with one or two drives to 670 GB with two, four, or six drives. $1,899 to $2,675 for drives; $7,995 to $53,000 for jukeboxes. 800-445-9400 or 408-474-0100.

LaserMaster PressMate-FS. This chemical-free film printer produces 2,400-dpi positive or negative film separations for spot-color, four-color, black-and-white, or duotone printing. Features include SmoothTone stochastic screening and a film-size capacity of up to 12 x 26 inches. $13,000. 800-221-6646 or 612-944-9330.

SOFTWARE

Director Academic. Prentice-Hall is offering an inexpensive academic version of Macromedia's media-integration software that makes combining digital video, scripting, and 2-D animation — as well as graphic image and sound importation — a reasonable (and economical) task for novices. An upgrade card provides a discount on the full version of Director 4.0. Prentice-Hall New Media. $99. 800-887-9998 or 201-236-3459.

Database Toolkit for OpenDoc. Create a suite of interacting OpenDoc parts that integrate SQL-database information into business or graphics applications — provided they're OpenDoc containers. Compatible SQL databases include those from Oracle and Informix. dtF Americas. $159. 800-383-1790 or 510-828-8785.

HSM ToolKit for Mac. If you can't organize your dental visits, much less your hard disk, check out FWB's Hierarchical Storage Management package. This utility automatically moves older files from primary — and expensive — fast hard drives to cheaper, slower secondary devices, such as tape drives. Users specify which files migrate and to where, and an alias icon remains as a clue to where the files lie. Compatible with AppleShare networks. FWB. $79. 415-325-4392.

▼ **Exploring the Lost Maya.** Tackling the fascinating subject of Mayan culture dating from 150 B.C. to A.D. 1500, this CD-ROM covers 40 architectural sites in several countries, with photographs of each site and 3-D sketches of probable older architectural incarnations. Slide shows, narration, videos, and photos reveal centuries of sculpture and religious art. Sumeria. $50. 415-904-0800.

MacDrive 95. This Windows 95 utility enables PC users to read and write Mac files from within the comfort zone of any familiar Windows application. Supports most media devices, including Zip, SyQuest, and external hard drives and optical drives. Media4 Productions. $70. 515-225-7409.

SoftWindows 95. This latest incarnation of the popular Windows emulator ships with an optimized version of Windows 95. TurboStart speeds boot time, and all SCSI devices and major network protocols are supported. Insignia Solutions. $349. 800-848-7677 or 408-327-6000. */ REBECCA OLSON*

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of March 4, 1996. Prices (other than those for compact models, Performas, and LCs) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

Mac Model	New	Used
Classic II (4/40)	•	$325
LC III (4/80)	•	$350
Performa 5215CD (8/1GB)	$1,899	$1,500
Performa 6220CD (16/1GB)	$1,899	$1,550
IIsi (5/80)	•	$300
IIci (4/80)	•	$425
IIfx (4/80)	•	$500
Quadra 605 (4/80)	•	$425
Quadra 610 (8/160)	•	$550
Quadra 630 (4/250)	•	$600
Quadra 650 (8/230)	•	$1,100
Quadra 660AV (8/230/CD)	•	$900
Quadra 700 (8/230)	•	$775
Quadra 800 (8/230)	•	$1,150
Quadra 840AV (8/230/CD)	•	$1,450
Quadra 900 (8/230)	•	$1,000
Quadra 950 (8/230)	•	$1,275
Power Mac 6100/66 (8/350/CD)	•	$1,000
Power Mac 7100/80 (8/700/CD)	$1,299	$1,125
Power Mac 7200/90 (8/500/CD)	$1,549	$1,300
Power Mac 7500/100 (16/1GB/CD)	$2,699	$2,200
Power Mac 8100/100 (16/1GB/CD)	•	$2,000
Power Mac 8100/110 (16/2GB/CD)	•	$2,300
Power Mac 8500/120 (16/2GB/CD)	$4,499	$3,700
Power Mac 9500/132 (16/2GB/CD)	$4,299	$3,800
PowerBook 145B (4/80)	•	$700
PowerBook 150 (4/120)	•	$700
PowerBook 165 (4/80)	•	$850
PowerBook 165c (4/80)	•	$1,050
PowerBook 170 (4/80)	•	$850
PowerBook 180 (4/120)	•	$1,200
PowerBook 190cs (8/500)	$1,999	$1,700
PowerBook 520 (4/160)	•	$1,100
PowerBook 520c (4/160)	•	$1,375
PowerBook 540 (4/240)	•	$1,400
PowerBook 540c (4/320)	•	$2,000
PowerBook 5300cs (8/500)	$2,499	$2,000
Duo 250 (4/200)	•	$1,100
Duo 280 (12/240)	•	$1,600
Duo 280c (4/320)	•	$1,700
Duo 2300c (8/750)	$3,499	$3,000

• = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 770-955-0569 or visit http://www.uce.com/. And find it on ZD Net/Mac, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER).

PHOTOGRAPHY / MICHAEL FALCONER

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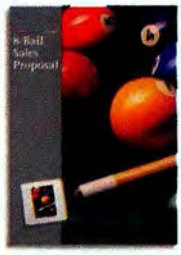

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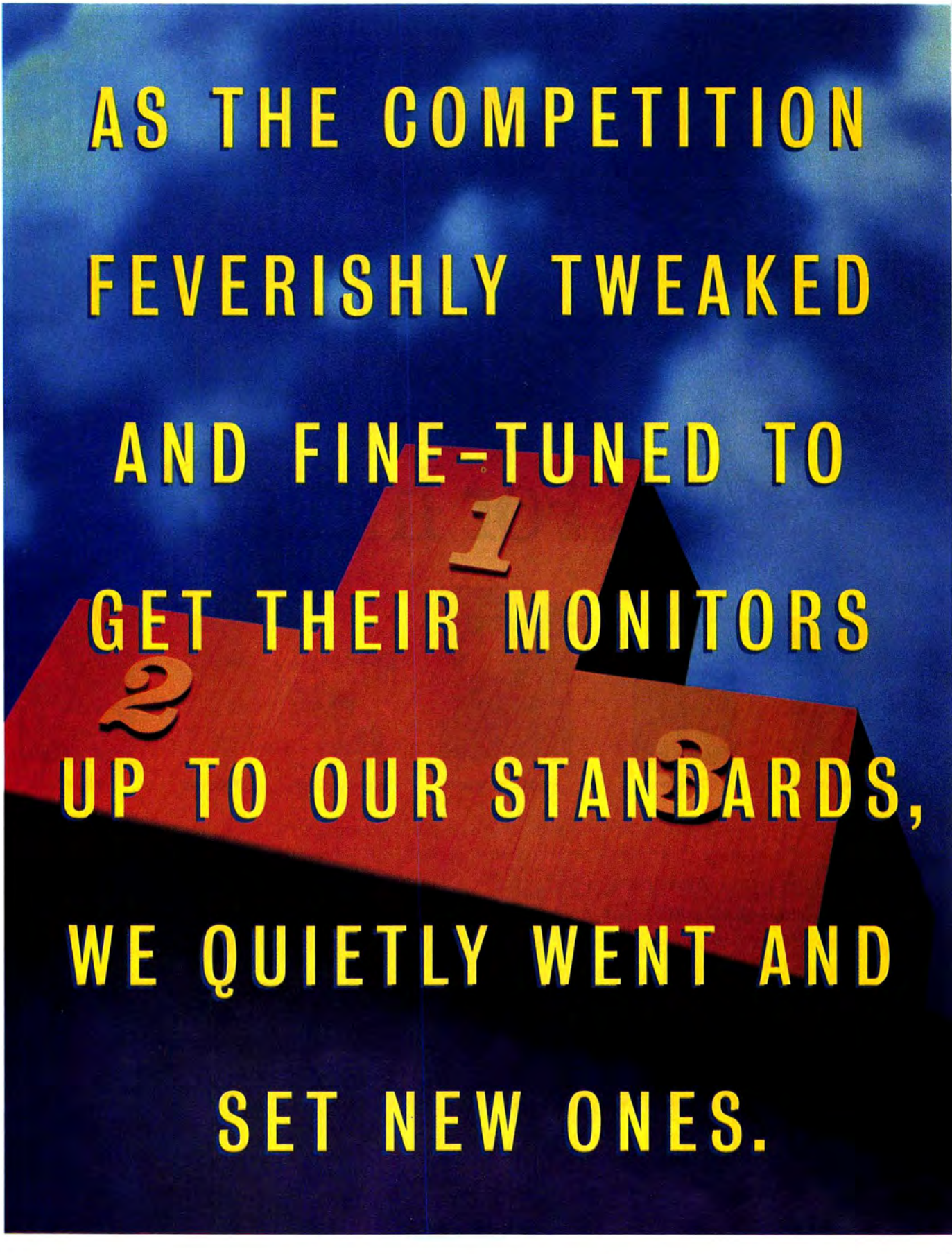

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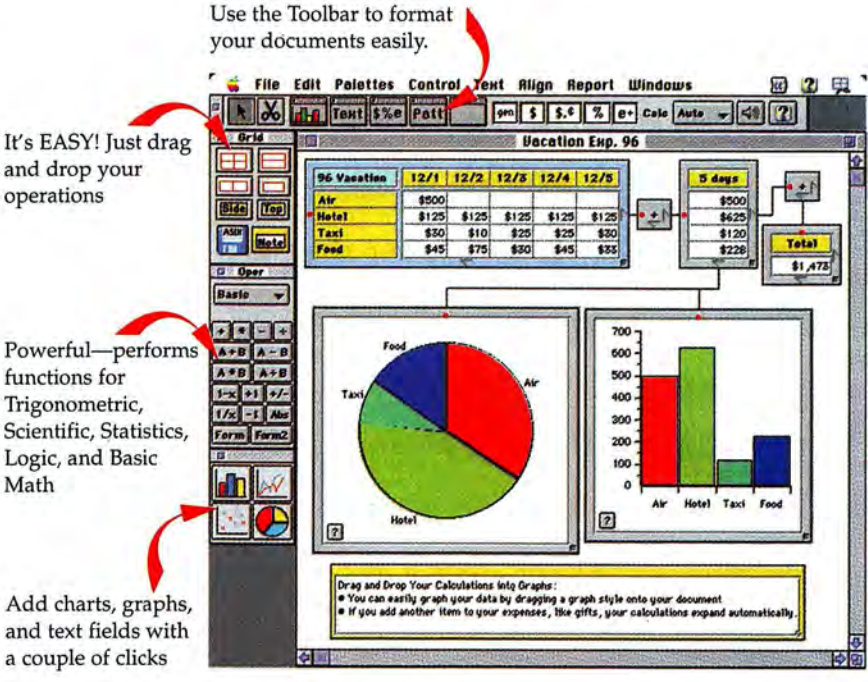

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MacWEEK REPORT

MacUser's Inside Track to Macintosh News

First PPCP Macs due out this fall

By Joanna Pearlstein

Apple's CPU plans for the rest of 1996 include the first PowerPC Platform Macintosh, multiprocessor machines and making the PowerPC 604e chip standard equipment across-the-board.

In November Apple will introduce its first PowerPC Platform, or PPCP, Macintosh with the debut of a system code-named Orient Express. According to sources, Orient Express will use a 166-MHz PowerPC 604e. Although exact pricing and configurations are still under consideration, a model with 16 Mbytes of RAM, a 1.2-Gbyte hard drive, a Level 2 cache and a CD-ROM drive should cost about $2,700.

Sources said Orient Express will represent only the beginning for Macs that can run multiple operating systems. Apple plans to move its midrange and high-end Power Mac lines to PPCP as soon as mid-1997.

In addition to Orient Express, Apple will reportedly ship two multiprocessor Macs in November, marking the company's first entry into the multi-CPU market.

Sources said the company will release multiprocessor 8500 and 9500 systems, both boasting two 200-MHz PowerPC 604e chips. With 16 Mbytes of RAM, a 4-Gbyte hard drive, a Level 2 cache and a CD-ROM drive, those systems will reportedly cost about $6,500 each.

In addition to multiprocessor systems, sources said Apple will also boost the speed of its single-chip Power Macintoshes. In fact, Apple will reportedly standardize on the PowerPC 604e in all but its Performa and LC lines.

"People don't realize how big a change this'll be for Apple," said a source familiar with the new chip design. "The great thing about the 604e is its scalability." Within six months of shipping its first 604e-based Macs, Apple will reportedly be offering systems that bump processor rates up to 250 MHz.

According to sources, Apple is planning to increase the speed and storage capacity of its Power Macintosh line to keep it competitive with Intel-standard PCs and its own PPCP offerings.

Autumn's 604e-based Mac crop

TYPE	NAME	SPEED	CONFIG.	PRICE
PPCP	Orient Express	166 MHz	16/1.2/CD/L2	$2,700
Multiprocessor	8500	Two 200 MHz	16/4/CD/L2	$6,500
	9500	Two 200 MHz	16/4/CD/L2	$6,500
Speed bump	7200	166 MHz	16/1.2/CD/L2	$2,400
	7600	180 MHz	16/2/CD/L2	$3,100
	8500	200 MHz	16/4/CD/L2	$5,400
	9500	200 MHz	16/4/CD/L2	$5,500

Sources said a 166-MHz Power Mac 7200 with 16 Mbytes of RAM, a 1.2-Gbyte hard drive, a Level 2 cache and a CD-ROM will likely cost less than $2,400; a similarly configured 180-MHz 604e-based 7600 with a 2-Gbyte hard drive will cost $3,100.

An 8500 with a single 200-MHz 604e processor, 16 Mbytes of RAM, a 4-Gbyte hard drive, a Level 2 cache and a CD-ROM will ship for about $5,400; a 9500 with the same equipment will run $5,500. Information about processor upgrades for older Macs was not available.

The PowerPC 604e chip is a faster version of the PowerPC 604.

The new version also includes twice as much on-board cache — 32 Kbytes — and system bus-clock multipliers.

Apple declined to comment. □

Game APIs spark new Apple era

By James Staten

Last month, Apple finally admitted that yes, the Mac is a toy.

At the March-held Computer Game Developers Conference in Santa Clara, the company announced plans to deliver Game Sprockets, a new suite of APIs that will improve the performance, interactivity and realism of Mac titles. Apple said it expects the first games using the code to appear in time for the holiday buying season.

The forthcoming tools will arrive with a new commitment by Apple to the games market — a drastic about-face from its traditional position.

"For years the Mac has been labeled a toy by the Wintel market, so Apple has put its emphasis on fighting this image, selling the Mac as a business machine," said Ben Calica, Apple senior product manager for game technologies. "Now we're saying not only is the Mac a toy, it's a really great toy."

Apple said game development is now a core strategy. According to Calica, the company's embracing of games is partially a reaction to similar moves by Microsoft Corp.

At last year's game developers conference, Microsoft unveiled its DirectX software development kit. Most of the DirectX APIs have been delivered to developers; the one exception is Direct3D, a hardware 3-D acceleration tool that is not expected to be final until the third quarter.

Game developers were positive about Apple's new direction. "Apple is clearly trying to keep the barriers low for DOS and PC game developers to come over to the Mac," said Jon Chait, CEO of Reality Bytes Inc. of Cambridge, Mass. "What I like most about Game Sprockets is that Apple involved us in the creation process from the beginning."

Apple's software developers kit will feature six APIs, including the already-shipping QuickDraw 3D RAVE hardware 3-D acceleration API. A preliminary version of the kit is available from a new Web site at http://dev.info.apple.com/games. Calica said the final version will ship at the end of April. □

INTRODUCING

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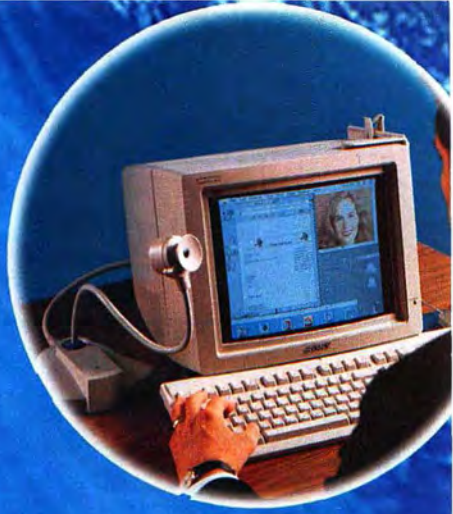

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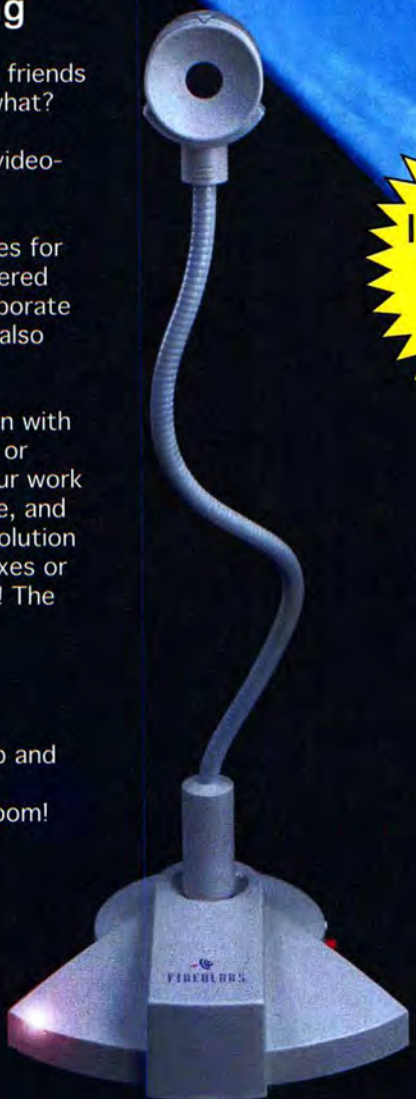

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CIRCLE **128** ON READER SERVICE CARD

Apple takes the bronze

By James Staten

According to figures released last month by Dataquest Inc. of San Jose, Calif., Apple Computer's piece of the worldwide PC pie was thinner last year, 7.8 percent compared with 8.3 percent in 1994. This occurred despite record sales of 4.7 million Macs, up from 3.9 million in 1994. Apple fell from second to third in total shipments for the year, losing ground most notably in the Japanese market, where Fujitsu Ltd. of Tokyo has been staging an all-out price war.

Scott Miller, senior industry analyst at Dataquest, said a record 60 million PCs shipped in the United States last year, a 26 percent increase over 1994's total of 48 million units. Compaq of Houston and IBM of Armonk, N.Y., finished in the top two spots worldwide with 10 percent and 7.9 percent portions, respectively.

Placing third in the U.S. market, Apple lost about half a percentage point from the previous year; it finished with an 11 percent share despite shipments of 2.5 million units, up from 2.16 million in 1994. Apple faced aggressive competition from first-place Compaq and second-place Packard Bell Electronics Inc. of Sacramento, Calif., which held 12.3 percent and 11.5 percent of the market, respectively.

Dataquest said the Mac's place in the laptop market was also challenged worldwide as Apple fell to the No. 5 position. NEC Corp. of Tokyo leapfrogged both Apple and IBM Corp.; NEC shipped 994,000 units in 1995 to capture 10 percent of the market.

Apple sold 661,000 notebooks, up from 644,000 in 1994, for a 6.7 percent share. Tokyo-based Toshiba International Corp. accounted for 15 percent of the notebook market. Compaq Computer Corp. and IBM finished second and fourth with 11 percent and 9.9 percent shares, respectively.

Apple's traditional weakness in the U.S. business market worsened in 1995. Corporate sales slipped 7 percent, while other vendors jumped 19.9 percent.

However, Apple's stronghold in the education market increased, Dataquest said, climbing by 50 percent and accounting for most of the overall segment's growth of 36 percent. Sales to home users were up 22 percent for the whole PC market; but Apple gained only 14 percent with these buyers.

Apple was also squeezed out of the government market, increasing its sales by only 2 percent while the segment as a whole improved by 17.9 percent. □

LERP spec to aim low

By David Morgenstern

Apple hopes clone makers will extend the Mac's reach by LERPs and bounds. Sources said the company may offer its licensees the Low End Reference Platform, a new Mac logic board design that will incorporate many Intel-standard PC components.

The low-cost platform builds on concepts outlined in the PowerPC Platform (PPCP), which give computer manufacturers a greater range of industry-standard components on which to base their systems. However, Low End Reference Platform, or LERP, designs will differ from PPCP in that LERP-based computers will run only the Mac OS, sources said.

LERP is reportedly based on Apple's first PCI Performa logic board. A standard LERP design will provide either a PowerPC 603e, 603ev or 604e processor; a PS/2 keyboard port; at least one 7-inch PCI slot; ADB, LocalTalk, GeoPort and SCSI connectors; and an Enhanced IDE (Integrated Drive Electronics) hard drive interface. LERP systems will initially run System 7.5.x.

In addition, LERP-based logic boards will not be required to have many of the Apple custom application-specific integrated circuits found in current clone designs or specified in Apple's upcoming PCI Performas, sources said. For example, a LERP Macintosh will use commonly available Intel-standard PC video controllers from at least one major PC video board maker.

The LERP ROM will be more flexible than current Mac versions. Sources said it will gracefully look for alternatives if required hardware, such as a floppy drive, is missing.

LERP will also let vendors customize Mac hardware designs. Sources said LERP boards will be based on the LPX form factor commonly used for PC clones. LPX designs offer several configuration options, such as slots mounted on a riser card.

Insiders said LERP will widen the field for potential Mac licensees. "A clone maker won't need a lot of Mac expertise to get into the market with LERP," said a vendor familiar with the platform.

While declining to provide any specifics, Apple said LERP is a "project under consideration" and that it represents an intermediate stage between current Macintosh designs, which are difficult to produce, and the open PPCP standard. □

PowerPC cousins: LERP and PPCP

LERP	PPCP
PowerPC 604 and 603 processors	PowerPC 604 and 603 processors
System 7.5.x, Copland	System 7.5.x, Copland, AIX, NetWare, OS/2, Solaris, Windows NT
PCI slots	PCI, support for ISA
ADB, GeoPort, LocalTalk ports; PS/2 keyboard	PC mouse and keyboard; support for ADB, GeoPort, LocalTalk, parallel ports; Sound Blaster

Microsoft repositions OLE

By James Staten

Microsoft last month changed the name of OLE Controls to ActiveX Controls and recast the technology as a cross-platform architecture for delivering multimedia over the Internet.

The company said it plans to provide support for ActiveX through Version 3.0 of its Internet Explorer (IE) Web browser, which was unveiled as part of the announcement.

ActiveX Controls require Version 2.0 of OLE, which is not fully implemented on the Mac. Microsoft said it will elicit the help of Macromedia Inc. to bring ActiveX to Apple's platform later this year. San Francisco-based Macromedia said it wants to ensure that ActiveX interoperates with Xtras, Macromedia's new plug-in architecture.

Like OpenDoc parts or Netscape Navigator plug-ins, ActiveX Controls provide a way to add functions to an application, Microsoft said.

Microsoft said IE 3.0, due for the Mac in the third quarter, will support Navigator frames, JavaScript, HTML style sheets, TrueType fonts and Sun Microsystems Inc.'s Java programming language.

Microsoft Corp. of Redmond, Wash., can be reached at (206) 882-8080 or (800) 426-9400; fax (800) 727-3351; info@microsoft.com. □

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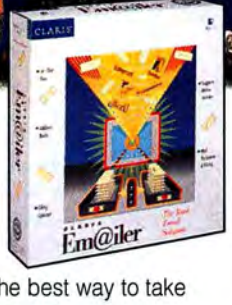

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REVIEWS

Macs and Clones

Apple Power Mac 7200/75 ★★★

Apple Power Mac 7200/90 ★★★½

Power Computing PowerCurve 601/120 ★★★★

Back to basics with frugally frill-free desktop systems.

PHOTOGRAPHY / ADRIAN ORDENANA

BELLS AND WHISTLES such as video capture and videoconferencing are great for technophiles, multimedia mavens, and status-conscious executives. But if you're a small-business operator whose eyes never stray far from the balance sheet, jazzy multimedia features may boil down to overkill — expensive overkill. If you're one among the legions who want a computer for creating basic business correspondence, planning budgets, and maybe handling e-mail or a little online research, the Apple Power Macintosh 7200/75 or 7200/90 or the Power Computing PowerCurve 601/120 may meet your needs — at prices you'll appreciate.

Comparing the Power Mac 7200s and the PowerCurve is logical, for several reasons: For starters, all are built around the same Apple-designed motherboard, which means they have the same important data-handling and input/output characteristics. Furthermore, they're lower-end versions of their respective vendors' mainstream desktop systems — Apple's Power Mac 7500 and Power Computing's PowerWave series. On one hand, their second-string status means they lack cutting-edge features, such as the video-capture module in the Power Mac 7500s and the ability to use either PCI or NuBus expansion cards in the PowerWaves. Conversely, however, the kid-sibling systems offer many features essential to the top-of-the-line models but in much more affordable packages.

The shared logic-board design endows the three systems with several features in common. Each has three PCI expansion-card slots — and in most office settings, that's three more than you'll ever use. On-board Ethernet, with ports for connecting 10BASE-T as well as AAUI connectors, is something you're far more likely to tap, because it makes networking your computers easy. Each has a pair of serial ports that allow modem and printer connections but that are also compatible with Apple's GeoPort Telecom Adapter (about $200). This add-on hardware lets you plug your phone into the computer and set up voice-mail, fax, and other services that come in handy in small-business settings.

Each model also has the same basic memory capacity: four slots for system-RAM DIMMs, for a maximum capacity of 256 MB of RAM; 1 MB of built-in VRAM, with three add-on slots, for a top capacity of 4 MB; and a slot that accommodates as much as 512K of Level 2 cache memory. The 7200s and the PowerCurve ship in configurations that include 16 MB of system RAM — a good starting amount for basic business use. VRAM upgrades probably won't be necessary for most office tasks — unless you absolutely need millions of colors on a super-resolution (1,600 x 1,200 pixel) monitor. However, do consider adding Level 2 cache; even a minimal upgrade of 256K (about $130) will boost system speed appreciably.

REVIEWS RATING KEY	
★★★★★	OUTSTANDING
★★★★	VERY GOOD
★★★	ACCEPTABLE
★★	POOR
★	SERIOUSLY FLAWED
💣	DANGEROUS

What's the Difference?

In terms of basic system hardware, what sets the 7200s apart from each other and from the PowerCurve is the processor clock speed. The systems are based on PowerPC 601 processors — the first, and least powerful, of the PowerPC chips. The 7200/75's chip runs at a clock speed of 75 MHz, the 7200/90's at 90 MHz, and the PowerCurve 601/120's at (surprise!) 120 MHz. All three systems are perfectly adequate for business use, but the speed differences are noticeable when you use the machines in succession. A slight boost in system responsiveness (for scrolling, opening files, and so on) is apparent when you move from the 7200/75 to the 7200/90; a more pronounced improvement is noticeable when you move to the PowerCurve 601/120.

To see how these speed differences translate into effectiveness for various

tasks, we tested each system with our MacBench 3.0 benchmarking software. The scores indicate that subjective impressions are consistent with results — to a point: The PowerCurve outstripped the Apple machines across the board in both general-business tests and our higher-end publishing tests, with one exception: Graphics were unaffected by processor speed — owing to all three computers' identical video subsystems. As you'd expect, the 7200/90 had a slight edge over the 7200/75 on the tests that measure pure processing horsepower — the Processor and Floating Point tests. On the tests that hinge on file-transfer speed and hard-drive input and output, however, one 7200 was essentially as good as the other.

Note that the PowerCurve's processor-speed advantage over the 7200s could increase in the future — at least in theory. The 7200s' processors are permanently soldered onto their motherboards, but the PowerCurve's 601 chip sits on a removable daughtercard. The idea is that you'll be able to replace it with a faster chip someday, but no replacement card exists and Power Computing hasn't committed to building or selling one. Even though there's no PowerCurve processor-upgrade option today, the potential for one is reassuring.

If you decide to add memory, expansion cards, or other add-on hardware, you'll discover another of the big differences between the 7200s and the PowerCurve — ease of access to the innards. The 7200s have a big edge in this department, with an ingenious foldout chassis that exposes the motherboard (and its expansion slots) and brings the hard-disk and CD-ROM drives, power supply, and other components within easy reach. Like the 7200s', the PowerCurve's case is easily removable and memory-module and expansion-card slots are plainly visible, but the PowerCurve's insides are generally more cramped. Replacing the hard drive is particularly tricky with the PowerCurve, because you must remove the CD-ROM drive to get at the hard drive.

Bundles of Value

You get lots more than just a piece of hardware when you buy a desktop computer, and hardware and software add-ons contribute greatly to a system's overall value. For extras, Power Computing's PowerCurve definitely has an advantage — although some of the bonus stuff doesn't really offer much. On the useful side, you get ClarisWorks — the versatile, entry-level word processor/spreadsheet/database/e-mail-client program; a limited version of Nisus Writer, a robust word processor; Now Up-to-Date and Now Contact, full-featured calendar and contact-manager software; and Now Utilities, a great collection of tools for customizing your computer. You also get Quicken, a terrific personal-finance program that can double as bookkeeping software for a one-person business. On the less useful front, you get four kid-oriented Grolier CD-ROMs and Launch, a CD-ROM magazine for the MTV crowd. (These titles are apparently meant to make the PowerCurve appealing to home users, but Apple Performa models, with much-more-generous bundles of software for children, make better sense for family use.)

Apple's 7200 software bundle is much more modest: Aside from a system-software CD-ROM, you get two programs that use the GeoPort adapter (and are useless unless you buy the adapter separately); fax software; and a limited version of Cypress Software's MegaPhone, which lets you use your Mac to dial your phone, log calls, and store voice-mail.

What About Price?

Conventional wisdom holds that Power Computing, as the off-brand Mac OS-system vendor, should be the bargain leader. Indeed, the PowerCurve 601/120, with 16 MB of RAM, a 1-GB hard drive, and a CD-ROM drive, is reasonably priced, at just over $2,300. But the price/performance edge goes to Apple: The 7200s, which will have been shipping for about a year as you read this, are probably approaching the end of their life cycle, and prices are in an appealing downward spiral. As this article went to press, the 7200/90 in an ideal office configuration with 16 MB of RAM, a 500-MB hard drive, and a CD-ROM drive was available by mail-order for a trifle over $1,600. A 7200/75 with 8 MB of RAM and a 350-MB hard drive was a steal, at just over $1,000.

The Bottom Line

The PowerCurve 601/120 and the Power Mac 7200 models would make fine additions to many office settings, and they each offer solid price/performance value. Even though it's more expensive than its Apple rivals, however, the PowerCurve emerges as a standout: For standard business tasks, with its 120-MHz PowerPC 601 processor, it outraces the 90-MHz-601-based 7200/90 and the 75-MHz-601-based 7200/75. Its removable processor daughtercard (even though no replacement is shipping), a beefy software bundle, and included mouse and keyboard round out a rock-solid business package. The Apple systems offer a more elegant case design and greater ease of expandability, but their chief advantage is price. With street prices starting at just over $1,000, they offer a lot of computer for the money. / Jim Shatz-Akin

Apple Power Mac 7200/75 (16/500/CD), $1,200; **Apple Power Mac 7200/90** (16/500/CD), $1,500 (estimated street). **Company:** Apple Computer, Cupertino, CA; 800-776-2333 or 408-974-1010; http://www.apple.com/. **Reader Service:** Circle #400.

Power Computing PowerCurve 601/120 (16MB/1GB/CD), $2,317 (direct). **Company:** Power Computing, Austin, TX; 800-404-7693 or 512-528-1350; http://www.powercc.com/. **Reader Service:** Circle #401.

SPEED TRIALS / see how basic business systems stack up

To see how fast the PowerCurve 601/120 and the Power Mac 7200s are for general business tasks, compare their scores on MacBench 3.0's main tests. If you're interested in an office machine that doubles as a workstation for producing company newsletters or other desktop-published documents, take a look at the Publishing Graphics Mix scores as well. MacBench 3.0 scores are relative to those of the Power Mac 6100/60, which is assigned a score of 10.0 in each test.

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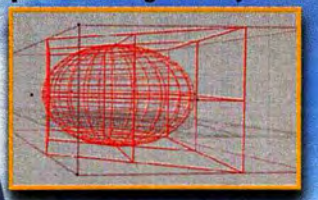

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CIRCLE 81 ON READER SERVICE CARD

Page-to-Text Pros

OmniPage Pro 6.0 ★★★★

TextBridge Pro ★★★

The OCR derby is no longer much of a horse race.

ILLUSTRATOR VERSUS FREEHAND. PageMaker versus QuarkXPress. Word versus WordPerfect. Add OmniPage Pro and TextBridge Pro to the list of classic two-horse rivalries in the Mac-applications field. Caere's OmniPage family has set the pace in OCR (optical character recognition) on the Mac for most of the last decade, but in recent years, Xerox's lower-cost TextBridge has come on strong.

With new releases from both companies — OmniPage Pro 6.0 and the first Pro version of TextBridge — the competition looks tighter than ever, and you may have a tough time deciding where to place your bets. But after putting both through their paces, we found a winner — and it wasn't even a photo finish.

What's New

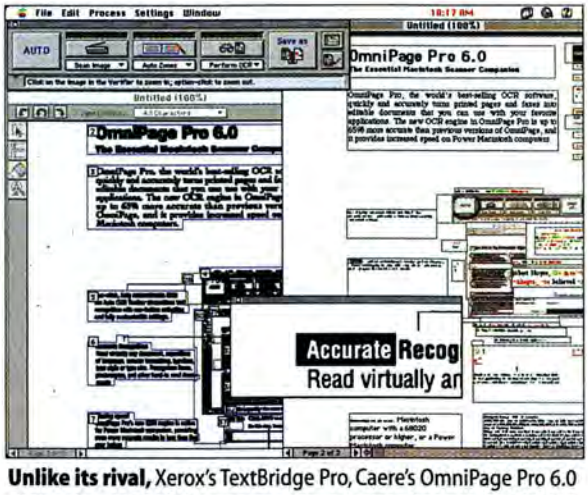
The latest OmniPage promises improved accuracy and performance, but what most users will notice are the new features. You can now have the program enter text directly into other applications (a trick that previously required a separate application, OmniPage Direct). An option called True Page, which used to be available only for Windows, preserves a document's layout when the document is scanned and recognized. A new suite of custom Apple events makes it possible to control nearly all OmniPage features through scripts. And to help you put your documents onto the Web, you can now save processed pages in HTML (HyperText Markup Language) format, but only basic formatting tags are supported.

TextBridge Pro's new-features list mirrors OmniPage Pro 6.0's. Highlights include direct input into other applications, HTML output, and even better AppleScript support than what OmniPage offers (macros are recordable as well as scriptable). In response to Caere's True Page, TextBridge Pro offers a different solution: It enables you to output a scanned document to WordPerfect 3.1 or 3.5 or to Microsoft Word 6.0.1 with most formatting remaining intact.

Putting Them to the Test

In most of our tests, TextBridge Pro proved a bit faster than OmniPage Pro 6.0 but not significantly so. In terms of accuracy, both programs did a good — although rarely letter-perfect — job of handling pages of plain text in standard fonts and sizes. With anything more challenging — small type, complex layouts, or faxed originals, for example — both programs made plenty of errors.

Generally, however, OmniPage's output was closer to the mark than TextBridge's. When we scanned a newspaper sidebar listing nine Web addresses, for example, both programs made mistakes in all nine, but with OmniPage, five of them needed to have only a single character changed.



Unlike its rival, Xerox's TextBridge Pro, Caere's OmniPage Pro 6.0 shows you text as it is generated from scanned pages; TextBridge Pro lets you view the original page, but not the resultant text, during a scan.

If OmniPage wins by only a nose in accuracy, it leads by several lengths in two other areas: usability and resource requirements. OmniPage's user interface is straightforward and attractive; for most operations, you simply click on the Auto button. In case you are uncertain, there are two Apple Guides and Balloon Help.

With TextBridge, on the other hand, our experience was one of frequent confusion and some irritation, starting from the moment we discovered that a standard installation had littered our Extensions folder and Chooser with more than 20 scanner drivers. The program's tool-bar buttons are cryptic, and there are no labels or tool tips to explain them (although you can avail yourself of Balloon Help and an Apple Guide). Tasks that require only one click in OmniPage often demand two, three, or four in TextBridge. And the Apple-menu utility that launches TextBridge for input into other programs never remembers where its parent application is located.

Most important, TextBridge gives you no way to edit the text it produces; for that you need to jump to a word processor. In contrast, you can edit the text OmniPage generates within the program itself; to make it easier, questionable words are color-coded and a good spelling checker is built in. What's more, an Option–double-click anywhere in the document brings up an enlarged bitmap of that area of the source document so you can double-check results.

The last issue is memory. TextBridge Pro's suggested allocation on a PowerPC-based system is 11,720K (10,240K if virtual memory is on), which means you generally can't keep it and another major application open simultaneously on a 16-MB system. OmniPage Pro 6.0's suggested allocation of 6,832K (4,500K with virtual memory) leaves much more flexibility. Xerox's Apple-menu launch utility alone requests 384K; Caere's needs only a meager 32K.

The Bottom Line

Price used to be a big differentiator between these two programs. No more, at least in most cases: The OmniPage Pro 6.0 upgrade kit, available through retail channels for $149, installs the program on any hard disk on which it finds another application from Caere or former rival Calera. Most Mac scanners come with software from one of these companies, so if you've got a scanner, you're probably eligible. Upgrades from retail versions of OmniPage cost $99.

Xerox has an even broader offer: It will sell TextBridge Pro for $129 to anyone who owns a scanner or fax software. But our conclusion is that OmniPage Pro is well worth the $20 premium. / Henry Norr

OmniPage Pro 6.0, $500 (estimated street). **Company:** Caere, Los Gatos, CA; 800-535-7226 or 408-395-7000; http://www.caere.com/. **Reader Service:** Circle #402.

TextBridge Pro, $275 (estimated street). **Company:** Xerox, Palo Alto, CA; 800-248-6550, ext. 3, or 415-813-6800; http://www.xerox.com/. **Reader Service:** Circle #403.

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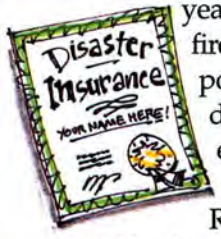

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Newer NUpowr

$$$$

Speedy PowerPC card boosts PowerBook 500s.

APPLE SOLD TONS of its 500-series PowerBooks, due in no small part to the promise that the 68LC040-based computers would be PowerPC-upgradable. But when PowerPC-based PowerBooks replaced the 500s last year, no Apple upgrade was in the offing. Now, many months later, Newer Technology has come to the rescue, with the NUpowr PowerPC upgrade card — and owners of PowerBook 500s may get the last laugh. In our tests, the NUpowr, with its 117-MHz PowerPC 603e, performed flawlessly and, with a couple of exceptions, delivered speeds as fast as (and in some cases, faster than) those of the PowerBook 5300c, with its 100-MHz PowerPC 603e chip.

The NUpowr is a replacement for the daughtercard that houses the central processor in the PowerBook 500s. In place of either the 50-MHz 68LC040 in the PowerBook 520 and 520c or the 66-MHz version in the PowerBook 540 and 540c, the NUpowr supplies a 117-MHz PowerPC 603e. Like the original daughtercards supplied in the PowerBook 500s, the NUpowr has a slot that accommodates RAM-upgrade modules (with a maximum capacity of 36 MB). Unlike the original daughtercards, each of which include 4 MB of soldered-down RAM, the NUpowr comes with three built-in memory options: 0 MB ($670 estimated street), 4 MB ($875 estimated street), and 8 MB ($1,079 estimated street). These prices do not reflect the $80 trade-in rebate Newer is offering for original 68LC040 daughtercards. We tested the 8-MB version.

Assembly Required

We were favorably impressed by the way the NUpowr sped up a PowerBook 520, but first we had to get the card installed — a tricky, but far from impossible, business. Newer suggests that if you're not a do-it-yourselfer, you may want to pay your dealer to perform the installation. We agree and suggest the same course for techies who don't have access to a CD-ROM drive. Newer supplies Apple's system software for PowerPC-based PowerBooks on CD-ROM only, and you must upgrade your old system software to use the NUpowr. Note, too, that if you purchased a PowerBook 500 recently enough that it's still under warranty, opening its case will void that agreement.

Following Newer's straightforward manual (and squinting at its numerous but often uselessly blurry photos), we installed the supplied PowerBook system software (version 7.5.2, update 1.5) and removed seven screws with a tool from the NUpowr box. The daughtercard and the attached memory-upgrade module were shoehorned into the case, and wiggling them free without damaging their delicate circuitry took a little finesse, especially in a PowerBook that had a Global Village internal modem installed. Once the card was out, however, replacing it with the NUpowr was simple.

Is It Fast?

We subjectively noticed a speed improvement immediately after the installation of the NUpowr in both a PowerBook 540c and a PowerBook 520. This was especially true for fat-binary applications we optimistically installed long ago: Running at last in PowerPC-native mode, they felt considerably snappier.

To measure the extent of the speed boost, we ran several tests on a PowerBook 520 with an 8-MB NUpowr installed and 8 MB of add-on RAM, using MacBench 3.0, our industry-standard system-level benchmarking software. Our full results are in the chart, which shows that the NUpowr-equipped PowerBook compared favorably with the PowerBook 5300c. For raw-processing tasks, the NUpowr's extra 17 MHz of clock speed evidently compensated for the memory-addressing architecture in the PowerBook 500s, which is slower than the one in the 100-MHz PowerBook 5300 series.

In the Floating Point test, the 500-series machines, which lack a floating-point processor, barely registered, whereas the 520 with the NUpowr installed outstripped even the 5300c.

Communications Breakdown

The only significant drawbacks of the NUpowr we can cite are a pair of major ones, although they're not inherent to the card and Newer expects both to be fixed by the time you read this. The Global Village PowerPort Mercury modem — the only internal-modem option for the PowerBook 500 series — doesn't work with a PowerPC processor, and neither do Revisions A and B of the Apple PowerBook PCMCIA Expansion Module, which allow the PowerBook 500s to accommodate PC Card modems and storage devices. A free upgrade to Revision C of the expansion module is available from Apple dealers, and Global Village was beta-testing its modem-software fix as this article went to press.

Of less immediate concern is Copland, the next-generation Mac OS Apple plans to ship in 1997. Despite Apple's refusal to guarantee that Copland will run on PowerPC-upgraded PowerBooks, Newer Technology has pledged to do everything possible to ensure that NUpowr-equipped PowerBook 500s will run Copland.

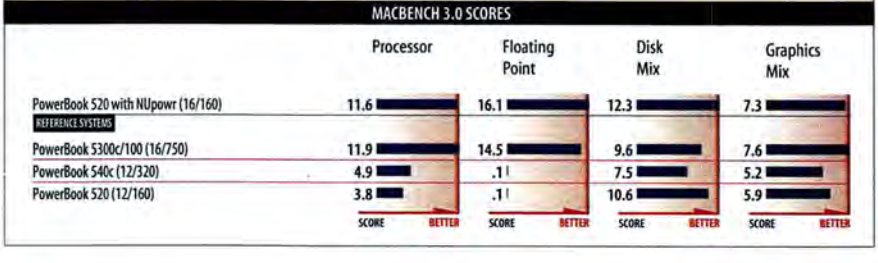
The Bottom Line

Installing the NUpowr is straightforward enough for even marginally capable do-it-yourselfers. The effort pays off in significant speed improvements — and the addition of floating-point-math capabilities necessary for applications such as 3-D rendering (as well as many of the coolest new games). If telecommunications or PC Card use is critical for your PowerBook, however, obtain incompatibility fixes from Apple and Global Village before you buy. / Jim Shatz-Akin

Newer NUpowr, $670 and up (estimated street).
Company: Newer Technology, Wichita, KS; 800-678-3726 or 316-685-4904; http://www.newertech.com/.
Reader Service: Circle #404.

POWERBOOK UPGRADE / how much faster is the NUpowr?

If you want to see how much Newer's NUpowr PowerPC upgrade card can boost the speed of your PowerBook 500 model, compare the MacBench 3.0 scores for a NUpowr-equipped PowerBook 520 with those for your current PowerBook — and those for the top-selling PowerPC-equipped PowerBook 5300c. MacBench 3.0 scores are relative to those of the Power Mac 6100/60, which is assigned a score of 10.0 in each test.



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MacUser 100 MacWEEK Aug. '94

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WorldWrite 3.0

$$$

Entry-level tool knows many alphabets and languages.

EVER SINCE MICROSOFT WORD 6.0's harshly received debut, one company after another has trumpeted its product as *the* word processor for the Mac or, more cattily, as an upgrade to Word 6. Now, more than a year after the Word 6.0.1 upgrade fixed many of Word's worst flaws, WorldWrite 3.0 has arrived on the scene, aiming to topple the Microsoft giant. Well, WorldWrite has a way to go before it beats Word as an all-purpose writing tool, but it has a definite advantage in one specific area: If you use languages that read right to left, such as Hebrew, or want to arrange non-Roman type vertically, WorldWrite's features (and attractively low price) may be for you.

WorldWrite originated in Israel and has been popular in the Middle East, Far East, and Europe for a few years. Version 3.0 is the first North American release of the product, and its chief claim to fame is its multinational outlook: It offers robust support for WorldScript and multilingual word processing. With the appropriate Apple Language Kit, WorldWrite supports right-to-left and vertical text options for many non-Roman alphabets. Although other word processors, notably Nisus Writer and MacWrite Pro, support WorldScript too, none are as flexible in handling non-Roman type.

Worldly Outlook

WorldWrite presents documents in two layers. You do your typing and text styling in the text layer and work with photos, graphs, other embedded graphics, or basic drawing tools in the graphics layer. Both layers are always visible, but available tools change when you switch layers.

WorldWrite is always in "what you see is what you get" mode, so pages appear as they'll print, with margins, headers, and footers in place. We found ourselves wishing this feature could be turned off, as in Word's Normal view, because it severely limited the amount of body text we could see at a given time. This was particularly problematic on a PowerBook, where WorldWrite's modest hard-disk needs (3.5 MB) and memory requirements (2 MB) make it an otherwise attractive option.

Familiar Territory

WorldWrite's interface is fairly standard: A top-of-the-page ruler bar contains draggable margin and tab-stop indicators; pop-up menus with spacing-, alignment-, and font-formatting controls; and buttons that let you insert tables or multiple-column text. Buttons at the bottom of the WorldWrite window help you navigate documents by jumping to the top or bottom of a page or the entire document; here also are master-page templates, where you can enter recurring elements such as page numbers, headers, and even watermarks that appear "behind" the text.

Less familiar features include a customizable pop-up menu on the ruler bar, to which you can add often used commands (you can also specify a custom keyboard shortcut for any menu command). WorldWrite's ruler bar tries to make the most of screen real estate by placing line- and character-formatting tools in a single multipurpose pop-up menu. This menu defaults to the Font Size function, but you can choose other text attributes from it and then change their values in the adjacent entry box. We'd have preferred this button to store a master menu with the options nested within it; WorldWrite takes this approach elsewhere, and it saved us mouse clicks.

Among WorldWrite's unique features are vertical arrangement of non-Roman type and text wrapping around nonrectangular graphics.

The program lets you format text at the paragraph level — setting margins, indents, line spacing, and so on — by creating style sheets, and it lets you specify character-level styles — including font, size, and bold or italic, via commands called AutoChars. To create either a style sheet or an AutoChar, you format selected text and then designate that information as a style sheet or AutoChar, using the style-formatting pop-up menu. To edit a style sheet or an AutoChar, you modify styled text and resave it under the same name. Style sheets and AutoChars remain attached to the document you're working on. They can be imported into new files but aren't stored in WorldWrite for use with new documents.

Our experience with WorldWrite was mixed. We found lots of nifty innovations but a near-equal number of puzzling inconveniences. Smart features include, in no particular order: the ability to print color separations with registration marks and crop marks; tools for generating indexes, tables of contents, endnotes, and footnotes; the Copy Append command, which lets you add text to Clipboard text; conditional mail-merge, which lets you use IF/THEN statements to automate form-letter generation; the Find and Change command, which replaces styles as well as words (so you can change all underlined text to italic); and the outstanding Thunder 7 spelling checker/thesaurus as a built-in proofing tool.

On the less intelligent side of the scale: Macintosh Drag and Drop edits aren't subject to the Undo command; you can't specify smart quotes as a preference, so you must use the Smarten Quotes command after you've entered your text; the Statistics command displays word counts and other text attributes with consistent inaccuracy; abysmal indexing of the Apple Guide file causes more frustration than it prevents; AppleScript is unsupported; and outlining tools are nonexistent.

The Bottom Line

WorldWrite is an affordable, straightforward word processor that runs well on modestly equipped Mac OS systems. It offers some world-class features, including its handling of non-Roman typefaces and its unique ability to wrap text around nonrectangular objects automatically. Unfortunately, these highlights are marred by substandard documentation and online help and clunky implementation of several essential features. Overall, ClarisWorks 4.0 is still a better and more flexible first word processor for most users, but if you need multiple-language support, WorldWrite will fill the bill. / Gregory Wasson

WorldWrite 3.0, $129 (list). **Company:** World Software, Saratoga, CA; 800-225-9299 or 801-350-9490. **Reader Service:** Circle #405.

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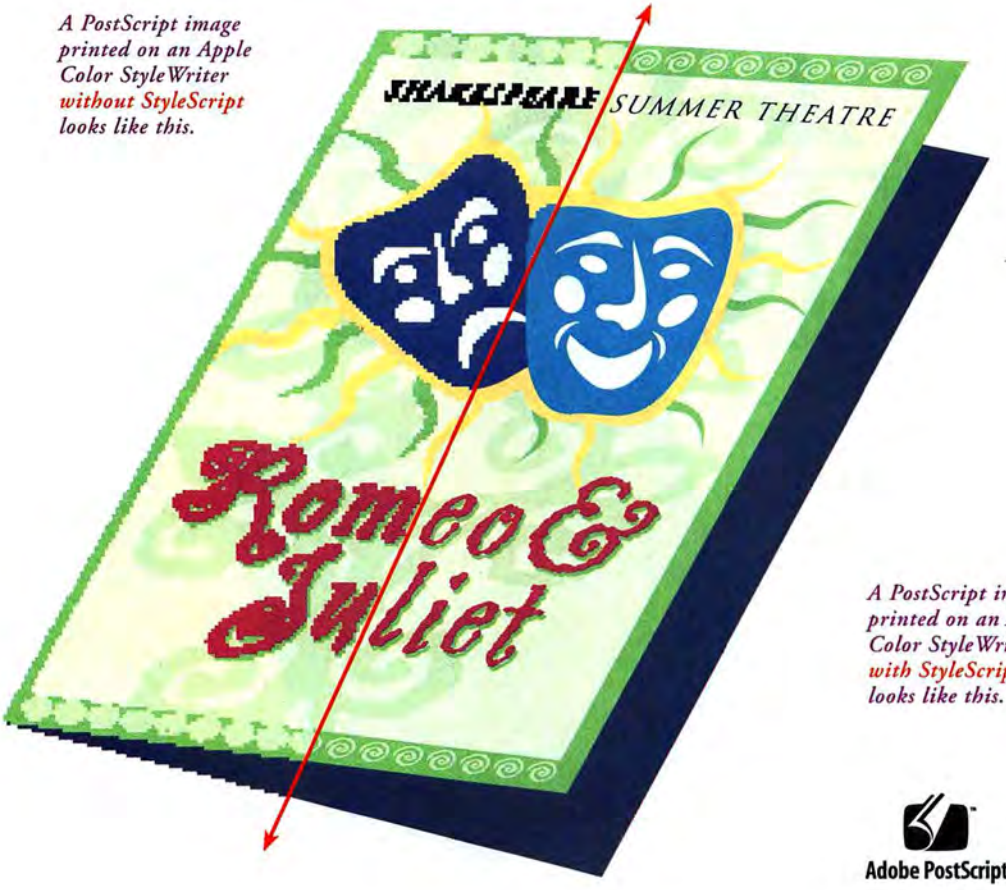
A PostScript image printed on an Apple Color StyleWriter without StyleScript looks like this.



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LightningDraw GX

★★★½

First drawing package to take advantage of QuickDraw GX.

QUICKDRAW GX has been available as part of the Mac OS for years, but applications have begun to take advantage of its features only recently. LightningDraw GX, from Lari Software, is the first drawing program to do so and as a result offers features unavailable in any other drawing package — on any platform. Although version 1.0 has some shortcomings as a design tool and although there are still big question marks associated with integrating GX-based graphics into the publishing mainstream, LightningDraw may be the best reason yet to consider installing QuickDraw GX on your Mac.

At first glance, LightningDraw looks much like MacDraw Pro or ClarisDraw, with palettes containing many familiar drawing tools. The fill, line, and text tear-off menus will also seem familiar if you use other Mac drawing packages. In spite of its ordinary appearance, however, LightningDraw conceals remarkable power just below the surface.

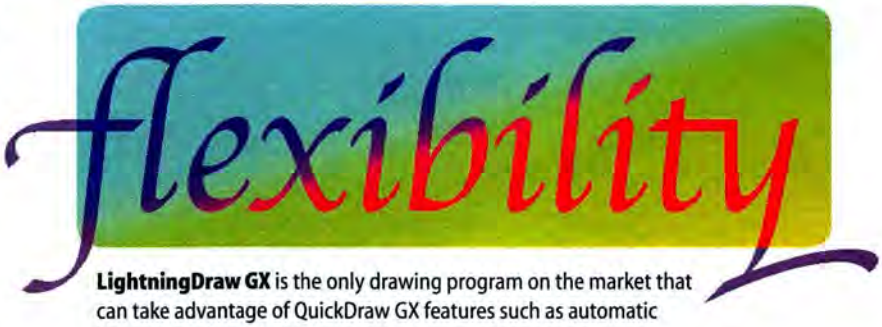
The Versatile Type

One of the advantages of QuickDraw GX that LightningDraw taps is its sophisticated handling of type: GX fonts offer a much richer set of capabilities than do traditional fonts. A single GX font file, in addition to the upper- and lowercase characters found in TrueType or Type 1 fonts, can contain such sophisticated goodies as alternative character sets, swash characters, small caps, old-style numerals, and an expanded set of ligatures, as well as a range of widths and weights.

LightningDraw supports all these advanced type attributes, but, like other applications that support GX fonts, LightningDraw has failed to develop an interface that makes it easy to understand and control type-related features. For example, the program has a control palette that governs special GX font features but several important type attributes — size, style, and color among them — aren't accessible from it. Selecting a typeface, point size, style, and color for a string of text requires trips to four different menus or palettes. In fairness, the awkwardness of some of LightningDraw's controls is the result of Lari's adherence to Apple's interface guidelines for QuickDraw GX; still, there's considerable room for improvement.

I'm Looking Through You

Object translucence — the ability to fill objects and type with see-through color and have them interact realistically — is another unique advantage LightningDraw has over other drawing packages. PostScript-based applications such as Adobe Illustrator and Macromedia FreeHand let you create pseudo-translucent effects, but PostScript does not support true translucence: If you created, say, a translucent yellow object and a translucent blue one in a PostScript package and then placed one object on top of the other, PostScript would create the expected green color in the overlapping areas by turning each overlapping section into a discrete object, making it next to impossible to edit the original objects. LightningDraw has no such limitation. Because translucence is built into the QuickDraw GX imaging model, objects, including text, can have true translucence (see figure) yet remain easily editable.



LightningDraw GX is the only drawing program on the market that can take advantage of QuickDraw GX features such as automatic ligatures and translucence.

Doughnuts? Easy As Pie

LightningDraw also breaks new ground when it comes to drawing tools. Take the program's InConcert feature, for example. Want to cut a pie slice out of a circle? Click on the circle, select the polygon tool, choose the Remove from Selection option from the InConcert pop-up menu, and draw a triangle that bites into the circle. The circle reshapes itself, with the wedge missing. Want to turn the circle into a doughnut instead? Choose the Cut Out from Object option from InConcert, and draw a small circle inside the existing one. You can add onto a shape in the same way, using any of the drawing tools and InConcert's Merge with Selection option.

You can also reshape an object by directly manipulating its border with the reshaping tool. If you're used to working with Bézier control points, you'll find that the program's approach takes a bit of getting used to. A sensitivity slider controls whether your reshaping affects the entire object or only the immediate area. We had some difficulty, though, adjusting the sensitivity slider to accomplish exactly what we wanted.

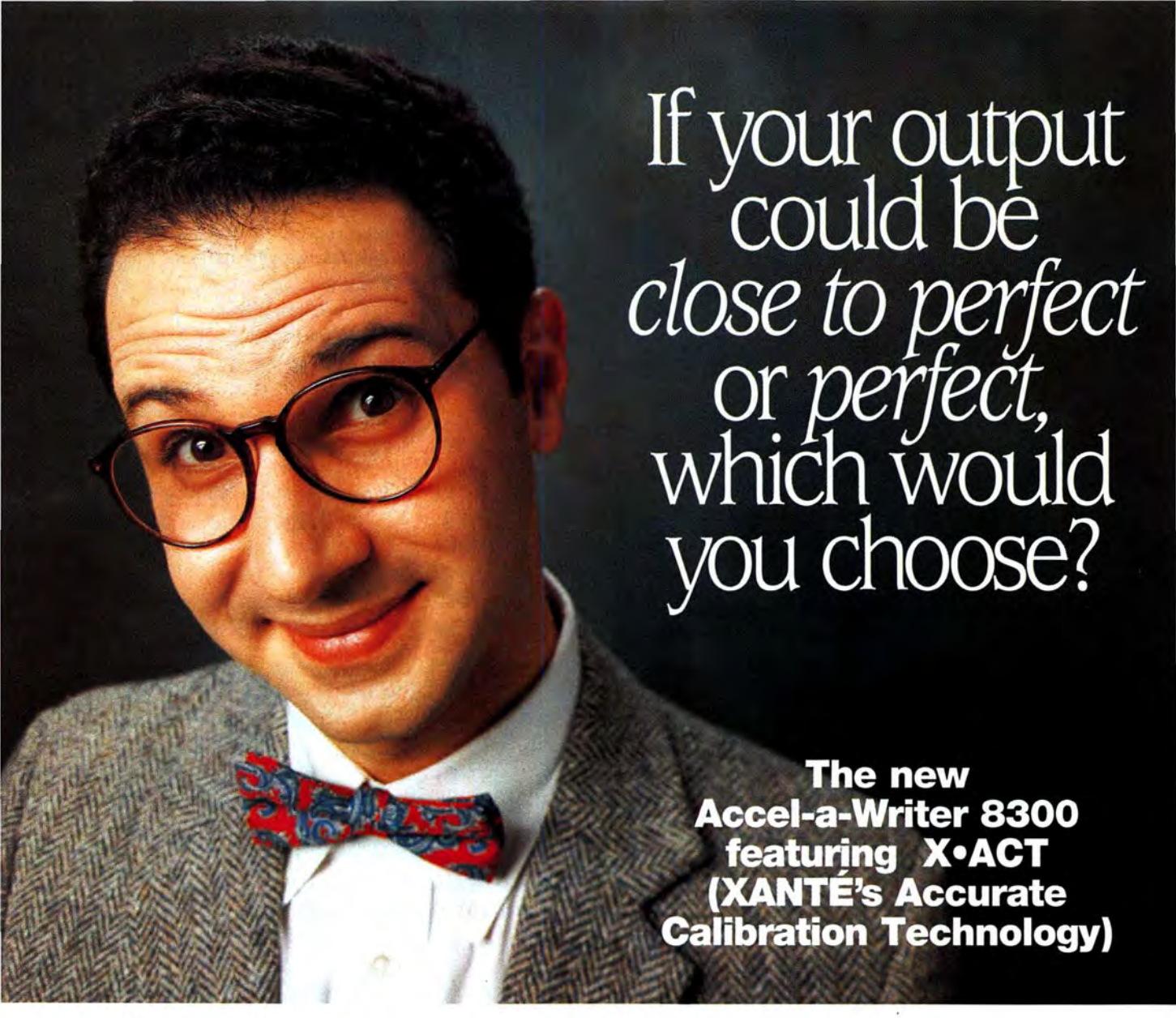
In addition to having some interface problems, LightningDraw also suffers from being the odd man out in the publishing world. It can't, for example, import TIFF images, something even Illustrator — at long last — can now do. Nor can it import EPS files. And although it can output EPS files, EPS format converts GX type to line art, so it's no longer editable as text. Furthermore, you wouldn't have to have too active an imagination to envision problems incorporating LightningDraw images into QuarkXPress layouts. And since no GX-based drivers yet exist for imagesetters, high-end output from LightningDraw is still a question mark.

Still, LightningDraw is a powerful program and offers features unique among drawing applications. With the arrival of System 8 sometime next year, QuickDraw GX will become more difficult to avoid in the world of desktop design and publishing. It's not too early to get familiar with its full range of capabilities. For now, LightningDraw is the only drawing program that will let you do that.

The Bottom Line

Bundled with an assortment of GX fonts, digital stock art, and several handy utilities, it's a bargain, at $299 list. Install QuickDraw GX on a Zip cartridge, pick up a copy of LightningDraw, and experiment. You just might get hooked. / Henry Bortman

LightningDraw GX 1.0, $299 (list). **Company:** Lari Software, Chapel Hill, NC; 800-933-7303 or 919-968-0701. **Reader Service:** Circle #406.



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Global Village OneWorld Combo

4 4 4 4

Versatile telecom tool is well suited for office workgroups.

ITS NAME MAY SUGGEST a Disneyland lunch special, but the OneWorld Combo is actually a versatile telecommunications server from Global Village that's well suited to small businesses and workgroups. The OneWorld Combo lets you give small-business or workgroup employees fax-modem capabilities over your office network, without the expense of putting modems on every desk. In a box little bigger than a desktop modem, the OneWorld Combo serves up a network modem, send and receive fax capability, and an ARA (Apple Remote Access) server — and they all work speedily and easily.

It's Nice to Share

The OneWorld Combo houses one or two Global Village TelePort Platinum V.34, 28.8-kbps modems, which you can place anywhere on your office's Ethernet or LocalTalk network. The OneWorld Combo may be in a closet somewhere, but users on your network can use it as though it were sitting on their desks: They see a send/receive status indicator in their menu bar and, if they want to, can even hear the modem squeaks and squawks through the computer speaker.

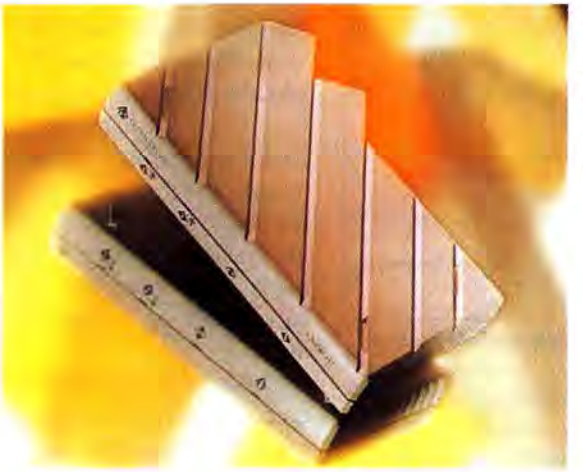
To send faxes, you work with the same easy-to-use GlobalFax software that comes with every Global Village modem. Receiving faxes is more complicated: You must designate one Mac on the network as the receive station, and the user of that computer must manually route the faxes to the other users. The sender can use PowerTalk, since Global Village has included a PowerTalk mailer in the receive-fax software. You can also have the OneWorld Combo act as a traditional fax machine by setting the receive station to automatically print all received faxes. (Given the OneWorld Combo's inability to transmit paper documents without the addition of a scanner somewhere on the network, we think that most offices will still want a traditional fax machine.)

Besides giving users data-transmission and fax-send capability, the OneWorld Combo can be configured to receive incoming faxes or to answer and route calls from ARA users dialing into your network. The OneWorld Combo acts just like a Mac running the ARA server software.

Smooth Sailing

We experienced speedy, trouble-free connections when we used the OneWorld Combo to dial up the Internet, CompuServe, and America Online — and actually saw a speed boost in some instances, compared to direct connection to a desktop modem: Connecting to the OneWorld Combo over Ethernet removes the 56-kbps transfer-rate limit set by non-PCI Macs' serial ports, allowing some communications programs to transfer data at 115 kbps.

Despite this speed dividend, there are some ways in which a network modem is decidedly inferior to a personal one at your desk. The most obvious is that if coworkers are using the modem(s) in the OneWorld Combo, you can't.



Little larger than a desktop modem, Global Village's OneWorld Combo gives workgroups fax-modem capabilities over Mac networks.

If you're sending a fax, this isn't a big deal, because the OneWorld Combo automatically queues jobs, like a printer, and sends them when the modem is free. For data calls, the method is less elegant: A dialog box simply tells you to try again later. It'd be great if the OneWorld Combo could let you "take a number" when the modems are in use and then alert you when the line is free.

Another drawback of a network modem is that an Ethernet user may still have to give up a serial port temporarily when using communications programs that don't support Apple's Communications Toolbox. CompuServe Information Manager, for instance, does not recognize the Comm Toolbox-enabled Network Modem connection option and forces you to connect via the printer or modem serial port. Global Village's software routes the data to the OneWorld Combo automatically, but the designated serial port is rendered useless during the session.

Administrative Tools

To help manage modem traffic, you use the OneWorld Manager application to assign passwords and restrict user access to the modem, fax, and ARA. You can also limit online-service costs by setting the maximum time each user can spend online. You can set the OneWorld Combo to automatically disconnect anyone after a specified period of inactivity.

Version 1.6 of the Global Village Netmodem software fixes incompatibilities with Open Transport, the PowerPC-native networking software on PCI Macs, but we did find one bug. The Serial DMA extension will crash PCI Macs during startup if the Netmodem extension has already loaded. Since extensions load alphabetically, the workaround is to add a space at the beginning of the Serial DMA extension's name so that it loads before the Netmodem extension. Global Village expects this conflict to disappear with the arrival of Apple's next system-software release.

The Bottom Line

Despite this glitch, OneWorld Combo operation is mostly trouble-free. The product is easy to set up and creates speedy connections, and the OneWorld Manager application has good security features. Overall, the package is a solid, economical choice for supplying an office full of people with multiple ways to access the online world. / John Rizzo

Global Village OneWorld Combo, $2,099 (with two V.34 modems). **Company:** Global Village Communication, Sunnyvale, CA; 800-436-5591 or 408-523-1000; http://www.globalvillag.com/. **Reader Service:** Circle #407.

Movie Cleaner Pro

★★★★½

QuickTime compression tool is a must for multimedia pros.

IT'S ABOUT TIME a program arrived that finally addresses the unglamorous yet troublesome challenge of movie compression. Anyone involved in presentation of movies for CD-ROMs, games, the Web, or kiosks should take note of Movie Cleaner Pro, a small but invaluable utility from Terran Interactive.

Programs such as Adobe Premiere, Adobe After Effects, and Apple's MovieShop support movie compression but give you no options beyond the standard QuickTime defaults, which aren't universally suited to all types of source material. Movie Cleaner Pro takes movie compression beyond the scope of any existing QuickTime moviemaking program plus makes it easy to understand — no small feat in a world of complex concepts such as codecs (compression-decompression algorithms), frame rates, and filters.

Displaying preview results of QuickTime compression in this adjustable "before" and "after" window is one of Movie Cleaner Pro's many thoughtful features.

When you open a QuickTime file in Movie Cleaner Pro, the movie is instantly analyzed in terms of how it was originally compressed, and Movie Cleaner Pro presents you with vital stats such as the movie's file size, frame rate, and sample bit depth. This alone makes it valuable, because moviemaking programs don't supply this information easily. Once you've opened the movie, you have two options: easy and advanced mode.

Movie Cleaner Pro's easy mode runs you through a series of questions in plain English that do not require any knowledge of compression technicalities. It asks questions such as these: Is the movie of a talking head, or does it contain lots of zooms and pans? Which is more important, image quality or smooth motion? Will the movie be played back on a high-, mid-, or low-range Mac or PC? Simply check off the answers to these queries, and Movie Cleaner Pro will compress your movie accordingly.

When you switch to advanced mode, you can still see the answers to your questions but you also see how Movie Cleaner Pro set keyframes, specified codecs, and chose other parameters in response to your answers. Movie Cleaner Pro's algorithms are quite smart, so if you're new to movie compression, you can go between the easy and advanced mode and learn many nuances of compression. If you're already a whiz at QuickTime compression, you can override Movie Cleaner Pro's decisions easily.

Movie Cleaner Pro began life as a "home-built" tool for use on multimedia projects, and many features testify to its origins as a solution to pros' real-world problems. For example, you can preview the visual results of a compression pass as it's applied: A split-screen preview window lets you see "before" and "after" views of your compression results, so you can tell immediately if your chosen compression scheme is degrading image quality unacceptably. Another handy feature lets you eliminate "chattering" of stationary objects in your movie scenes by masking them out and replacing them with still images.

Movies can be cropped at any time, and batch processing allows you to compress multiple movies at the same or different settings. Movie Cleaner Pro gives you Indeo, a compression standard common on PCs, in addition to Mac-standard Cinepak compression. Each method has advantages for certain types of live-action footage, so with both standards at your disposal, you'll be able to make the best choice for the source footage involved.

The Bottom Line

Movie Cleaner Pro is a gem of a program that no serious multimedia developer should be without. It has everything that the file-size-conscious moviemaker needs and has a great interface; an excellent tutorial; and a superb, innovative feature set. / Lynda Weinman

Movie Cleaner Pro 1.0, $129.95 (list). **Company:** Terran Interactive, San Jose, CA; 800-577-3443 or 408-278-9065; http://www.terran-int.com/. **Reader Service:** Circle: #408.

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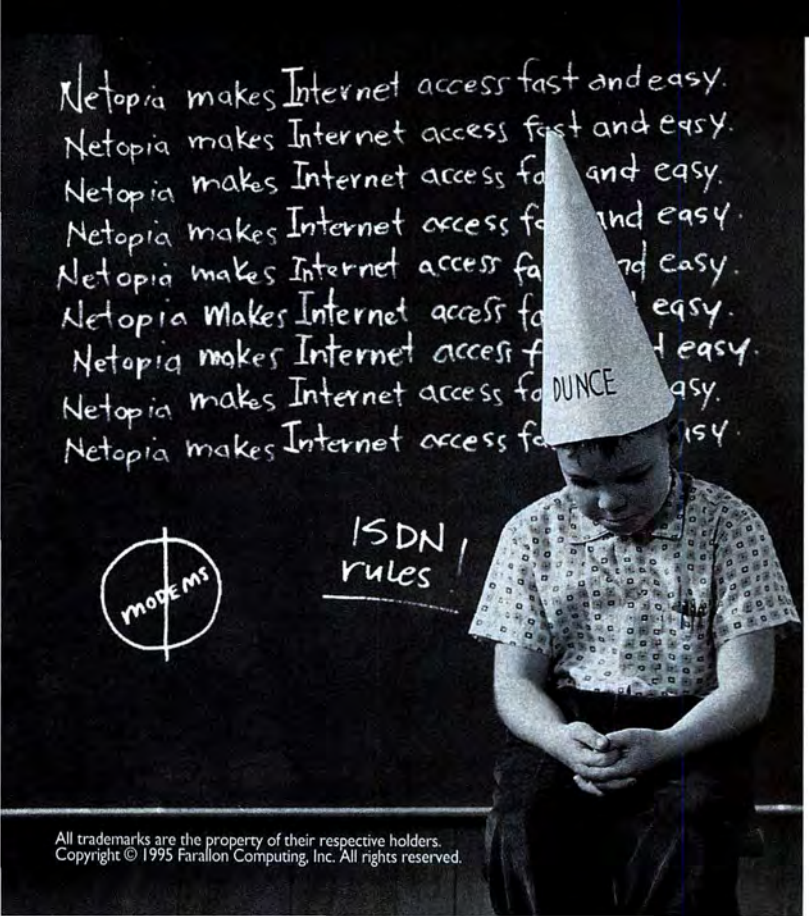

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ScanVec Tracer

★★★★

Bitmap-to-PostScript tool performs only one trick — but does it well.

IT'S NOT OFTEN that a new product can take on and beat a long-established standard, but that's what ScanVec has done with Tracer 1.0, which does a far better job of turning bitmapped artwork into vector PostScript than Adobe's venerable Streamline. Tracer produces outlines that preserve details that get lost in Streamline and that contain far fewer of the odd artifacts you find in Streamline's tracings.

Better tracings aren't the only difference between Tracer and Streamline, however. There is some bad news: Tracer is considerably more expensive ($495 versus $199), and unlike Streamline, it uses a security dongle as copy protection — a minor annoyance. More significantly, Tracer converts only black-and-white (1-bit) bitmaps, whereas Streamline can generate "posterized" PostScript from color or grayscale images. Moreover, Tracer is much slower than Streamline; in our testing, a file Streamline traced in a few seconds took Tracer well over two minutes.

Terrific Tracing

However, if you routinely use Streamline to convert black-and-white scans to vector graphics, you'll quickly find that the extra minutes of processing time Tracer requires will be returned many times over — and Tracer's higher price will soon be justified as well. That's because Tracer spares you much of the extensive, and often painstaking, cleanup work you must do on tracings produced by Streamline — even after tweaking Streamline's settings for optimal results.

To create a vector file, you either open a bitmap (you can work on only one image at a time in Tracer) or acquire one, using any Photoshop-compatible acquire plug-in. You can perform basic editing tasks on the bitmap, such as cropping, sizing, and rotating, and then choose among three tracing methods: centerline (which creates lines only, no filled shapes — best for technical illustrations such as blueprints) and two outline methods, one optimized for curves (best with small or poor-quality images) and the other for straight lines and sharp corners (best for large, high-quality images). Additional settings let you specify Tracer's tolerance in adhering to the original image shape, its sensitivity in detecting and sharpening corners, and whether it should try to close as many loops as possible (useful if you want to fill the outlines with color) or minimize the number of loops.

Nifty Tools

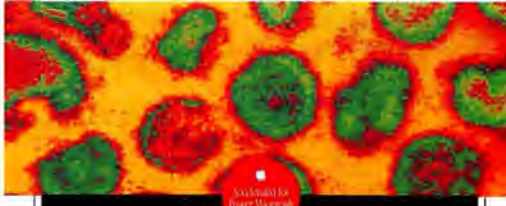
Although vector files created by Tracer generally need much less cleaning up than Streamline files, some tweaking will be required, and Tracer provides excellent tools for the job. You'll find all the familiar scaling, cutting, and aligning tools you'd expect in a Mac illustration package, plus a few unique ones that are so handy they may tempt you to open EPS files in Tracer to do things you can't in Adobe Illustrator or Macromedia FreeHand— much less in Streamline. First of all, there's a Bézier tool for adding control points to a path that's much easier to use than typical pen tools: Rather than forcing you to redefine existing parts of a path, Tracer lets you draw over a path and then replaces the original segment with the one you've just drawn.

Even better are Tracer's path-correction tools. Convert To Circle automatically turns any shape you select into a true circle rather than the jiggly approximation even Tracer sometimes creates on its own. Make Corner allows you to define any part of a traced path as a right-angle corner and change the corner's sharpness by dragging on control points Tracer places on either side of the corner's vertex. Fit Line lets you select beginning and end points on a path and automatically turns the intervening segment into a straight line. Similarly, Fit Arc lets you define a segment and turn it into a smooth arc, with only two Bézier control points, by dragging on the arc until it's the shape you want.

The Bottom Line

Tracer's a great program. We do wish, however, that ScanVec would lose the ADB-dongle copy protection. Some batch-processing capabilities, allowing you to trace multiple bitmaps in a single session, would also be handy. But if your raster-to-vector-conversion needs are anything more than the most occasional, Tracer is clearly the best tool available. If your time's money, you'll quickly recoup the steep cost in the time you save producing great-looking art from your scans. / Eric Taub

ScanVec Tracer 1.0, $495 (list). **Company:** ScanVec, Wilmington, MA; 800-866-6227 or 508-694-9482. **Reader Service:** Circle #409.



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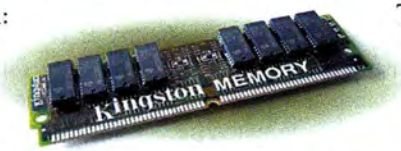

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CIRCLE **80** ON READER SERVICE CARD

PIMs

Day-Timer Organizer 2.0 ★★½

Full Contact 3.0 ★★★

New PIMs promise perfection but muster mere mediocrity.

IF YOU'RE LOOKING for the perfect PIM (personal information manager), don't expect fulfillment from either Day-Timer Organizer or Full Contact. Both of the products boast impressive features but are almost hopelessly hampered by complicated interfaces and sluggish performance.

Day-Timer Organizer 2.0

The offspring of a joint venture between Day-Timer (the paper-organizer folks) and Kensington Microware (of Turbo Mouse fame), Day-Timer Organizer 2.0 supposedly combines the ease of a loose-leaf organizer with the power of a computer in order to manage your schedules, to-do lists, addresses, phone calls, notes, and expenses. Unfortunately, Day-Timer Organizer adheres too closely to its paper roots and doesn't embrace the Mac's legendary ease of use.

Day-Timer Organizer's heavy reliance on the loose-leaf-binder metaphor makes entering and viewing your data much more difficult than need be.

The program imports tab- and comma-delimited text files, although the process is slow and difficult, since the topic is barely covered in the documentation and the interface is unforgiving. Instead of importing all the data into a single file, Day-Timer Organizer uses a hodgepodge of 11 separate files for each database.

Day-Timer Organizer goes overboard with windows as well as with files. The various sections of the program — daily, weekly, and monthly planners; address book; notebook; expenses; timeline; and the like — all appear in their own windows, so you can view a lot of information simultaneously, but even big monitors quickly become cluttered and it's easy to get lost in the jumble.

At first blush, Day-Timer Organizer looks polished and the features appear to offer most of what users have come to expect in a PIM, but major shortcomings become apparent as soon as you begin using the program on a daily basis. Common tasks are needlessly complicated by the excessive use of dialog boxes. For example, to add a new item, you click on the Add button in the tool bar and then choose the type of item from a dialog box. A pop-up menu would be much easier. Even more annoying, entries such as meetings on calendars can't be edited directly on the pages on which they appear but, rather, only in their corresponding dialog boxes.

Instead of using the power of the computer to help in data entry and display, Day-Timer Organizer forces you to adjust to its way of doing things. You add people to the address book in last-name/first-name order, for example, and it has no data-entry aids such as capitalization, auto-completion, and phone-number formatting.

Display defaults leave as much to be desired as data entry. Regardless of whether you're viewing the notebook, planners, or address book, Day-Timer Organizer shows only one line for each entry. You *can* see a multiline entry in its entirety, but to do so, you must manually add visible lines by clicking on a button — although this wastes space by expanding all entries.

Full Contact 3.0

In late 1995, Pitch Software acquired Full Contact from FIT Software and released version 3.0, incorporating new features such as workgroup functionality and support for PowerTalk, with shared calendars that use publish-and-subscribe. Other improvements include a new icon bar, reduced memory requirements, faster record deletion, password protection, a global Find command, and reports and templates for new Apple printers. Billed as "the most advanced contact manager

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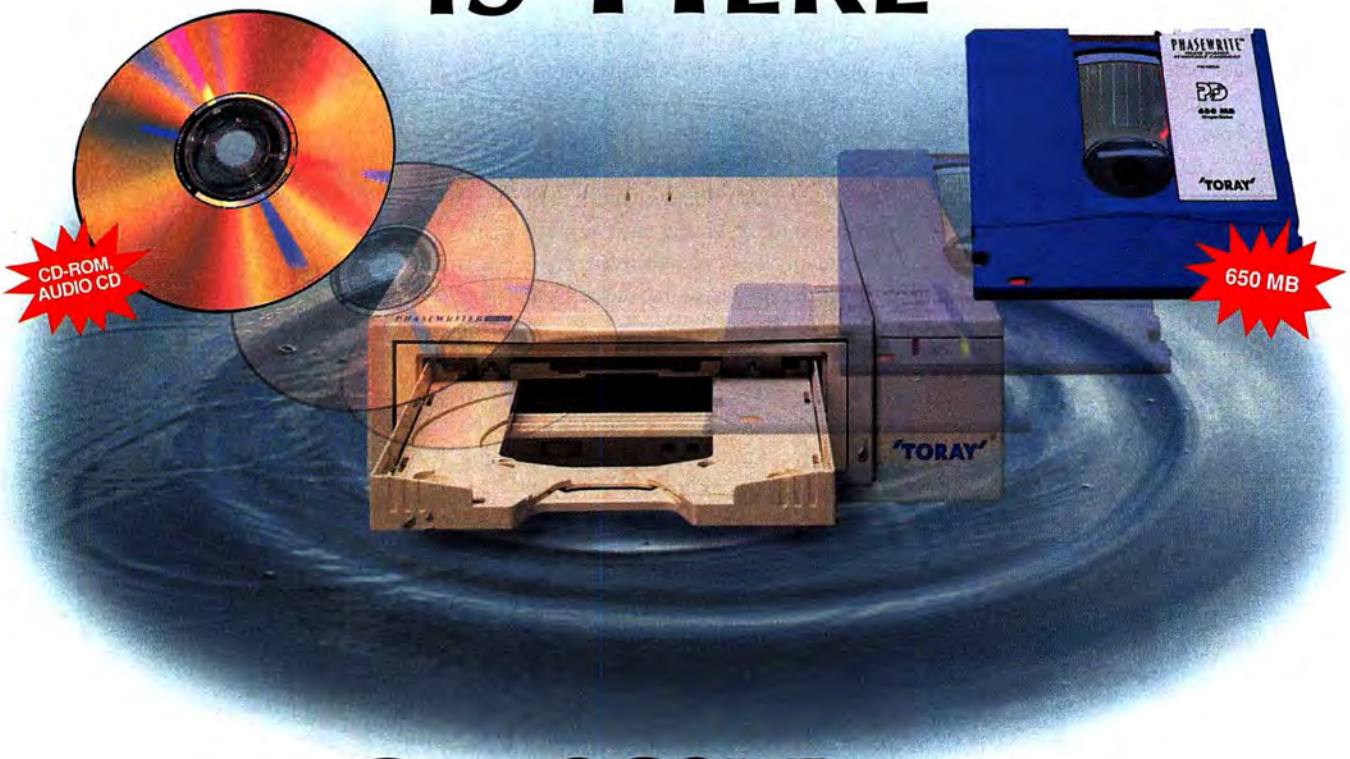

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for the Macintosh," Full Contact is designed for businesspeople who want to track their every contact with meticulous care.

Our disappointment with Full Contact began when we imported tab-delimited information from other programs. Due to the cramped, confusing interface, importing is terribly complicated unless you use the supplied templates for many popular PIMs. Importing is also slow, but that's excusable, since you're not likely to do it too often. Less forgivable is Full Contact's sluggish loading time (with 1,500 records stored, it took about a minute to load on a Power Mac 7500/100; on a Mac IIci, it took an unconscionable 11 minutes. On either machine, Day-Timer Organizer loaded the same data in seconds.

Full Contact is a relational-database program disguised as a PIM, and the result is a slow program with a cluttered, confusing interface.

Pitch blames the long load times on the fact that Full Contact is a relational-database program with separate windows (called SuperLists) for names, companies, phone numbers, addresses, notes, and activities, all of which can be linked to one another. But that doesn't explain why the program slows to a crawl under the weight of a modest-sized database. Again, this was especially pronounced on a Mac IIci, with a 25-MHz 68030 processor; this despite Full Contact's system-requirements statement, which indicates that it runs on any 68020-or-better Mac OS machine.

Full Contact allows you to store and view data in multiple ways. Paradoxically, however, Full Contact makes it very difficult to view all information pertaining to a single person in one window. The best Full Contact offers is a detailed view that crams as much as possible into a window with a series of tabs at the bottom for viewing links to other data.

In contrast to Day-Timer Organizer, Full Contact has some nice entry and formatting aids: Fields can be autocompleted, words can be capitalized upon entry if your initial entry matches existing data, and the format of phone numbers, dates, and times is standardized. In addition to these aids, Full Contact includes a few features that are add-ons in other PIMs. There's a built-in word processor for facilitating mail-merge operations and a calendar for tracking events and meetings. By integrating all this in one program, Full Contact can associate people with meetings, track letters sent to companies, and so on.

Full Contact would benefit greatly from a completely rewritten user manual (instead of the old 2.0 guide plus the addendum Pitch currently provides) that includes a step-by-step tutorial with sample files. Don't make the mistake of thinking tech support will come to the rescue. We never reached a live body when calling for technical support; instead we were always prompted to leave voice-mail or send e-mail. Pitch promises to return inquiries within one business day, but some calls went unanswered for days. Pitch claims that e-mail response is faster, but it's almost impossible to solve anything but the simplest technical problems via e-mail.

The Bottom Line

Day-Timer Organizer 2.0 offers a lot of functionality at a decent price. But overreliance on the organizer-book metaphor and the requirement that you enter data the way the program wants you to, instead of the other way around, limit its usefulness.

As for Full Contact 3.0, it *is* powerful and flexible, but the many ways it lets you store and view data are at best a mixed blessing. There are so many places data can be stored that unless you're extremely diligent about manually cross-referencing chunks of information, you may have trouble finding what you need when you need it. What's more, Full Contact's complexity leads to slow performance, especially on older Macs. For most users, a simpler, leaner program will probably suffice. / Owen W. Linzmayer

Day-Timer Organizer 2.05, $59.95 (list). **Company:** Day-Timer Technologies, San Mateo, CA; 800-225-5005 or 415-572-6260. **Reader Service:** Circle #410.

Full Contact 3.0, $199; upgrade from Full Contact 2.0 or Field Assistant, $39.95 (list). **Company:** Pitch Software, Campbell, CA; 800-242-2252 or 408-374-5504. **Reader Service:** Circle #411.

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SoundEdit 16 2.0

★★★½

Classic sound-editing application goes PowerPC-native.

MARKET ECONOMIES across the globe would crumble without three magic words: *new and improved!* Nowhere is this slogan more necessary than in the software business. After all, if version 2.0 of a particular product — say, Macromedia's SoundEdit 16 — boasted, "Slightly better than version 1.0!" how many users would pay 129 smackers to upgrade?

Let's move from economic theory to reality: Although SoundEdit 16 remains a fine, all-purpose sound-editing application, the current crop of enhancements — PowerPC-native code; batch conversion of file formats; a cleaner interface; and support for .au files, 4:1 IMA compression, and plug-in effects — don't merit a jump from version 1.0 to 2.0. A version 1.5 designation and an upgrade fee below $50 might be more appropriate.

Synchronizing sound with QuickTime movies is one of SoundEdit 16 2.0's strengths.

For those who are only now discovering digital audio on the Mac, here's the short story on the venerable SoundEdit. The program allows you to record, edit, and play multiple 8- or 16-bit soundtracks in a variety of formats (System 7 sound, resource, Sound Designer II, AIFF, .wav, .au, SoundEdit, SoundEdit 16, and QuickTime). Using such effects as echo, reverb, normalize, and pitch shift, you can alter the tracks to your liking. Each track contains separate level and pan controls for changing the volume of the sound as well as its position in the stereo field (left, right, or middle — nothing in between). These separate tracks can be combined into a single track or stereo pair with the Mix command. New to version 2.0 is the Deluxe Mixer — a window in which the volume and panning of the mixed track can be changed over time. This is an improvement over version 1.0, but its usefulness is limited, because the process cannot be performed as the track is playing but must rather be configured before mixing begins. This is far less useful than real-time mixing.

Also lacking in the real-time department are SoundEdit's built-in effects. Unlike with Photoshop filters, you cannot preview the results of a particular effect but must instead wait until the effect is applied and then — if you don't care for the results — issue the Undo command. Thankfully, InVision Interactive (415-812-7380) offers CyberSound FX, a $99 (estimated street) package of plug-in effects for SoundEdit 16 that can be previewed.

SoundEdit 16 1.0 excelled at sound-to-QuickTime sync. It is still one of SoundEdit's strongest features and, thanks to the new interface, is easier to implement. QuickTime sync is one reason to prefer SoundEdit 16 over Opcode's Audioshop — at $150, a significantly less expensive, full-featured sound-editing program that doesn't offer QuickTime sync.

SoundEdit 16 also faces stiff competition from another Opcode product, DigiTrax, and a new Macromedia sibling, Deck II 2.5. Both of these programs provide more-powerful professional audio features and support QuickTime synchronization. Deck II costs the same as SoundEdit 16; DigiTrax is $100 less. Those who intend to work with Internet-standard .au files should be aware that — unlike SoundEdit 16 — Audioshop, Deck II, and DigiTrax do not currently support these files.

The Bottom Line

SoundEdit 16 2.0 is a better version of a competent sound-editing tool that will be particularly useful to those who work with .au files and QuickTime. Unfortunately, considering the competition, the program offers too little bang for the buck. If it were half the price, we'd recommend SoundEdit 16 without hesitation. But it's $399. Shop around. / Christopher Breen

SoundEdit 16 2.0, $399 (list). **Company:** Macromedia, San Francisco, CA; 800-756-9603 or 415-252-2000; http://www.macromedia.com/. **Reader Service:** Circle #412.

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Address Managers

CyberFinder ★★★½

DragNet ★★★

Two utilities help organize Internet addresses.

KEEPING TRACK of your favorite Web-site addresses can be a major nuisance. Browser hot lists, such as Netscape Navigator's Bookmarks menu, help (especially with the hierarchical menus added in Navigator 2.0), but they have their limits. After a while, you're likely to find that scrolling to the bottom of your hot list can be like trying to swim to the bottom of the ocean — and the particular bookmark you need is elusive sunken treasure. There must be a better way.

With varying degrees of success, two new utilities — Aladdin's CyberFinder and OnBase Technology's DragNet — stake a claim to that better way. CyberFinder is clearly the less obtrusive of the two utilities. It is a control panel that seamlessly integrates its functions with those of the Finder: When you hold down a hot key and double-click on a URL (Uniform Resource Locator — the cyberspeak term for a Web address), CyberFinder stores it as a data file in the Finder. This works with addresses found online, in text files, or in virtually any other type of document.

When you want to revisit the site, you double-click on the CyberFinder file. The appropriate Internet application launches automatically and opens to the desired location. CyberFinder works with Web browsers, FTP programs (such as Anarchie), newsgroup programs (such as News Watcher), and almost any other program you care to designate.

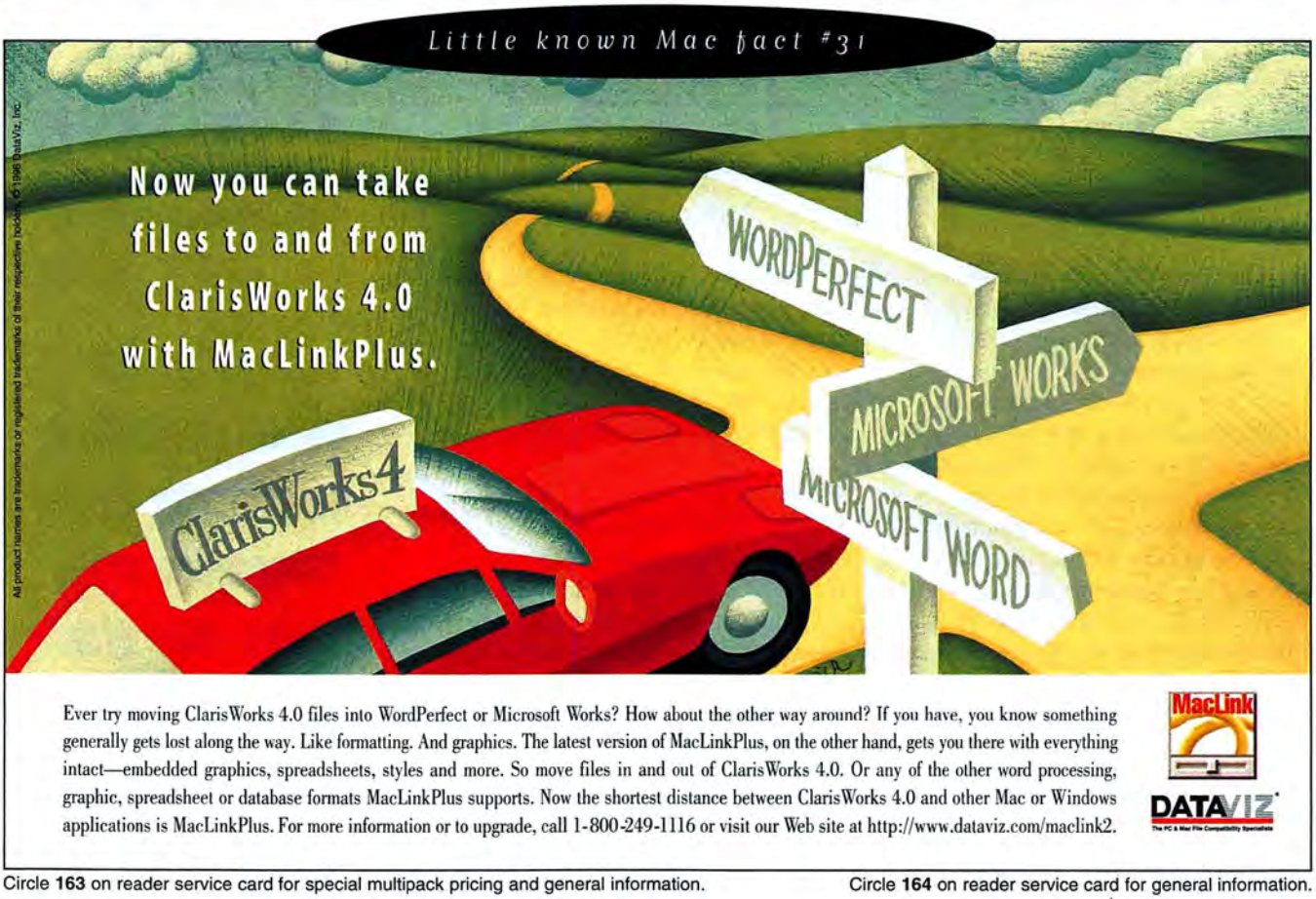
Congress of Libraries

Having hundreds of URL files cluttering up your hard disk is no better than having a messy hot list, so, happily, CyberFinder can combine files into libraries that work similarly to folders: Clicking on one expands it to reveal a list of the URLs it contains. It's easy to categorize your URLs logically in various libraries. Another library plus is that stashing URLs in them takes up *much* less disk space than storing the same number of URLs as separate files. You can also sort the listings in a library by using the Finder's View menu, which CyberFinder modifies to work with CyberFinder when a library file is the active window.

Just double-click on a CyberFinder bookmark from the desktop to launch your Internet application and open to the desired site.

The CyberFinder package comes with an impressive collection of well over a thousand URLs. It's like having your own mini Web index right on your desktop. Still, the point of the program is to be able to add your own URLs. No problem. Select any URL and press the appropriate hot keys, and CyberFinder creates a new bookmark file. And to quickly get you up to speed, CyberFinder treats your browser's bookmark file as a CyberFinder library.

Although CyberFinder's convenient integration with the Finder is its major asset, it is also the source of its greatest weakness. Since each library file is a totally separate entity,



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there is no efficient way to search for a particular bookmark across several libraries simultaneously. Nor can you conduct database-like searches, such as asking for all files that have the expression FAQ in their address.

DragNet Does Searches

If these limitations of CyberFinder seem especially bothersome, you will likely find DragNet more appealing. The DragNet application stores URLs in a single scrollable list organized into user-defined categories and subcategories. With DragNet you can even assign a single URL to multiple categories.

A double-click on any URL in the DragNet list takes you to the appropriate location in your Web browser. Although DragNet, unlike CyberFinder, works only with Web browsers, it works especially well with them. Rather than requiring hot keys for grabbing a URL, it lets you drag and drop hot links from your browser to any DragNet window. You can also easily import your browser's bookmark files. Where DragNet primarily surpasses CyberFinder is with its Searcher function. Type in a term, and DragNet creates a list of all addresses that contain that term in any of DragNet's fields.

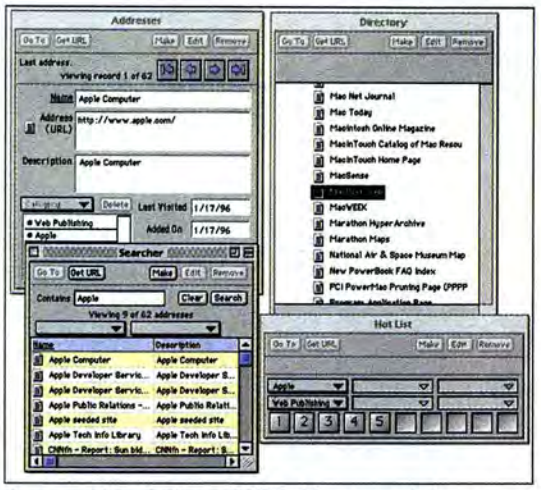
The usefulness of DragNet and CyberFinder depends on your diligence in adding addresses to them. But because DragNet must be separately launched, we suspect that it is more likely to be ignored. A less critical disadvantage is that DragNet's sample file contains only a fraction of the URLs that come with CyberFinder.

Both DragNet and CyberFinder would benefit from automatic deletion of inevitable duplicate addresses.

The Bottom Line

If you travel the Internet only occasionally, you will likely find that neither of these utilities saves you enough time to be worth its purchase price. On the other hand, if you want to combine their main features within the framework of an appointment calendar and contact database, consider waiting for CE Software's WebArranger, which was released just as this article went to press.

Otherwise, if you spend most of your Net time on the Web and want to be able to maintain a searchable URL archive, DragNet is the way to go. CyberFinder is the better choice if you regularly work with several Internet applications and want to be able to grab or launch URLs on the fly from any document.



Your own descriptions of Web addresses can help you search DragNet's address files.

On balance, CyberFinder's grab-and-launch feature is so convenient that we think this is the utility that will remain on your hard disk.

/ Ted Landau

CyberFinder 2.0, $30 (estimated street). **Company:** Aladdin Systems, Watsonville, CA; 408-761-6200; http://www.aladdinsys.com/. **Reader Service:** Circle #413.

DragNet 1.0.2, $39.95 (list). **Company:** OnBase Technology, Irvine, CA; 800-782-5682 or 714-830-5682; http://www.onbasetech.com/. **Reader Service:** Circle #414.

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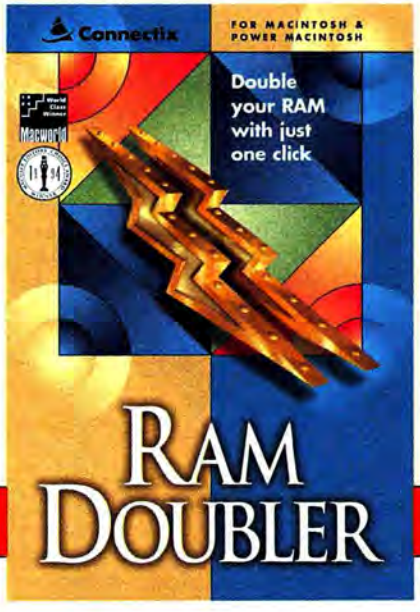

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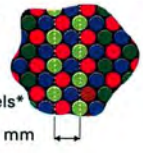

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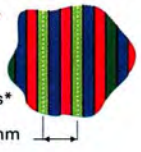

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Front Office

★★★½

Voice-mail for the whole office, using your GeoPort.

YOUR SMALL BUSINESS can sound like a megacorporation — at least on the phone — if you have a spare Quadra AV or PowerPC system, a GeoPort adapter, and Pleiades Front Office. Front Office is a voice-mail system that uses the GeoPort's voice, fax, and modem capabilities to answer your phone and take voice messages for multiple voice-mail boxes. It also includes a fax-back system, remote paging, the ability to set up information-only mailboxes, and other fancy features. Front Office is virtually identical to the Pleiades Digital Storefront Pro (see review, September '95, page 54), except that it doesn't require Pleiades' difficult-to-set-up hardware and costs $100 less.

If you don't already have one, you'll have to spend your $100 savings on a $119 Apple GeoPort Telecom Adapter Kit (see review, December '95, page 70) for the hardware you need to connect your telephone line to a central server Mac. Once you've equipped the server with the GeoPort, you can install the Front Office Manager software, set up your mailboxes and passwords, and create a caller navigation system.

You also use Manager to select the compression rate that will be applied to stored messages. Higher compression rates not only mean the messages use less hard-disk space but also reduce recording fidelity. At the default quality level, a ten-second voice message takes up approximately 32K of hard-disk space.

Each user with a voice-mail box on the server retrieves messages via client software called Desk Clerk. Messages play back off the server through the Mac speaker or headphones, but they remain stored on the server until mailbox owners (or system administrators) delete them. There's no limit to the number of mailboxes you can set up with Front Office, nor is there a limit — other than the server's hard-disk capacity — to the number of messages that can be stored on the server.

Front Office shares many features with its chief competitor, Cypress Research's PhonePro (see review, June '95, page 43). But unlike PhonePro, which requires you to learn, or at least get acquainted with, an iconic scripting language to set up a voice-mail system, Front Office comes preprogrammed and can be set up within an hour. In addition, only Front Office can forward a live call to a remote phone — provided that you're using your phone company's call-forwarding service.

If you already have a GeoPort kit, you know that it includes a voice-mail program of its own — a limited version of Cypress Research's MegaPhone, which gives you dial-out, address book, and speakerphone features that Front Office lacks. If you like MegaPhone, you don't have to give it up in order to use Front Office. Just turn off MegaPhone's Answer Calls feature and take Front Office off-line while you're using MegaPhone.

The Bottom Line

Front Office is a useful tool that's well suited to small businesses that want their phone systems to project the sound of a full-service corporation, without the cost of a traditional voice-mail system. / John Rizzo

Front Office 1.2, $299 (list). **Company:** Pleiades Research, Los Angeles, CA; 800-737-8277 or 213-257-1710. **Reader Service:** Circle #415.

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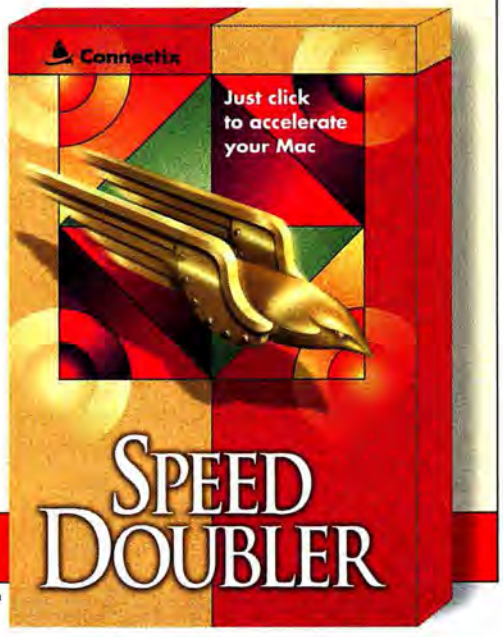

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Max 3.0

★★★★

Powerful MIDI programming — and much more.

WHEN MAX, OPCODE'S graphical music-programming software, was released a few years back, it made a very big splash in a very small pool. The big splash came with the realization that Mac MIDI users could now build programs to control *every* aspect of their MIDI devices, including changing sound parameters, triggering notes, transposing pitches, creating algorithmic composition routines — the works. Unfortunately, its pool of users was — and still is — limited by the number of people willing to tackle Max's sometimes complex constructs.

Fortunately, you don't have to understand every component of Max to build useful programs. Compared to those of traditional programming environments, the interface is positively friendly. You drag prebuilt objects from a palette in the main window to the work area below. Max contains over 200 of these objects, ranging from simple note-input and -output ports to sliders, dials, and random-number generators. In case you forget what a particular object does, Max's elegant online help system is always available. If included objects don't meet your needs, you're welcome to create new ones in the C programming language.

By connecting these objects, using virtual cords, you create Max programs. With version 3.0, you can now save these programs as stand-alone applications and distribute them — license-free — to other users.

"Swell," you say, "but what good is it?"

What Good It Is

With little more effort than running through the excellent tutorial, you can construct an effects program that contains harmonization, modulation, and delay components — meaning you can just route your MIDI instruments through Max and free up that $700 effects box for vocals. Or if your editor-librarian program doesn't support a particular piece of equipment, you can — with quite a bit more sweat and toil — build a custom software editor for use with that instrument.

But these projects are positively pedestrian compared to what Max is capable of. Many Max users are working on cutting-edge multimedia, electronic music, and performance-art projects. Here Max is used to control not only MIDI instruments but also audio files, graphics, lights, QuickTime movies, CD-ROM and laserdisc players, and serial devices — Max even contains an object that allows Mattel's Power Glove to control Max objects. Helpful to these users is the new Timeline feature, which allows Max events to be arranged and played in sequence.

The one fly in this vast ointment of potential is Opcode's insistence on copy-protecting the program. In this case, it's overkill. After all, the program is so specialized that a pirated copy would be useless without the manual.

The Bottom Line

Max is not for everyone. MIDI musicians looking for a sequencer or a patch librarian would be better off buying a software package dedicated to one of these functions. But for those with keen minds and a creative bent who trawl the boundaries of MIDI technology, Max offers amazing opportunities. / Christopher Breen

Max 3.0, $395 (list). **Company:** Opcode Systems, Palo Alto, CA; 415-856-3333. **Reader Service:** Circle #416.

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OneClick

★★★★½

Powerful palette builder may be the ultimate utility.

IF YOU'RE A VETERAN Mac user, chances are your computer is already custom-configured with one or more utilities that tailor the system to your way of working. Maybe you've got an application launcher such as Square One or DragStrip, a menu-and-folder enhancer such as Now Menus, or even a tool such as QuicKeys that lets you build macros to automate tasks in your favorite applications. What if, in the words of pitchman Ron Popeil, you could "throw them all away" and replace them with one versatile, easy-to-use program? What if that utility could save you some time *and* reduce your Mac's memory requirements? OneClick, from WestCode Software, offers all this and more in one powerful, easy-to-use program.

Sophisticated Palettes

The underlying metaphor of OneClick is the palette: an array of buttons that perform specific tasks. The program comes with prebuilt palettes that launch applications or open files or folders; let you choose among the applications running on your Mac; and perform shortcuts in applications, including ClarisWorks and FileMaker Pro. The company has promised to distribute palettes for additional applications on its Web site. (Custom palettes you create can be saved and shared with other users, and WestCode expects lots of button swapping on its Web site as well.)

Many of the prefab palettes that are supplied with OneClick are enhanced versions of tools already supplied with the Mac. The System Bar, for example, acts much like Apple's Control Strip but adds thoughtful extra features such as icons for your hard disk and System Folder that you can drag and drop items onto and a built-in phone-number list. The Task Bar is similar to the Finder's application menu, in that it shows you all your running applications, but Option-clicking on a program button hides all other running applications and brings your choice to the foreground.

And, as you'd probably guess, the Launch Strip is a replacement for Apple's Launcher. It launches items when you click on iconic application buttons or drag documents onto them but also maintains a pop-down recent-files list for each application.

Add Features to Programs

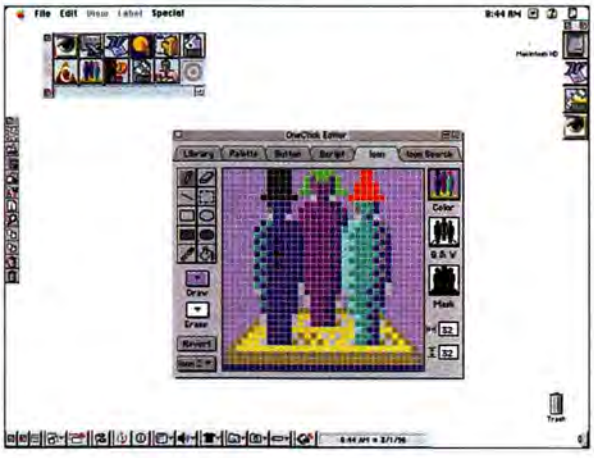
The supplied palettes and buttons can streamline many everyday tasks, but OneClick really proves its worth with application-specific palettes that let you add functions you've always wished for to your favorite programs. The process is surprisingly easy. Open the application you want to customize, launch the OneClick Editor, and create a new palette. You can then drag buttons from generous libraries supplied with OneClick or create them from scratch. The OneClick Editor, in one tightly integrated window, makes it easy to create or modify any aspect of a button, from its appearance to the script it executes: The scripting tool is linked to a well-annotated library of all OneClick EasyScript macros, which makes for quick orientation with the commands. The Icon Editor includes an easy-to-use icon-drawing and -editing tool. And for the nonartists among us, there's the Icon Search tool, which lets you grab icon resources from your favorite applications and turn them into OneClick palette buttons.

Once you've created a palette and tweaked all its buttons, you close the OneClick Editor and the palette links with the open application. Launch the program, and the palette appears on-screen; quit the application, and the palette vanishes.

Among the host of handy buttons supplied with OneClick are ones for Word Count, Auto Save, inserting the date and time in any text file, and inserting any preselected text block or image (such as your name and address or a logo) into text. Other supplied buttons are able to launch a program you specify; show the contents of any folder in a hierarchical list; move files to the Trash; display a font or window selection list; and perform a host of standard application tasks such as Cut, Paste, and Print. (If you're in the market for a no-frills word processor, OneClick could pay for itself with its supplied SimpleText palette, which turns the program into a surprisingly versatile writing tool.)

Power-User Features

The prebuilt buttons are great for doing things you and lots of other people want to do in various applications, but OneClick lets you customize even further, using scripting to automate tasks that only you do every day. You can record macros in show-and-tell fashion or write scripts in AppleScript, OneClick's EasyScript macro language (offering over 200 functions), or any combination of both. You can create a new command you wish for in your favorite program or create a better alternative to a clumsily implemented feature. Generally speaking, we found EasyScript more intuitive to work with than AppleScript, but it's great to have the freedom of using both languages.



The OneClick Editor lets you design palettes, buttons, and icons; create and manage button libraries; write macro scripts; and more.

The Bottom Line

Combining a macro utility, AppleScript front end, floating palettes, a program launcher, and more into one easy-to-use package is quite a feat. OneClick is one of the most powerful and remarkable utilities we've seen in the last couple of years. Consider yourself warned, however: Use it for a while, and you'll soon find yourself addicted. / Gregory Wasson

OneClick 1.0, $129 (list). **Company:** WestCode Software, San Diego, CA; 619-487-9200 or 619-487-9255 (fax); http://www.westcodesoft.com/. **Reader Service:** Circle #417.

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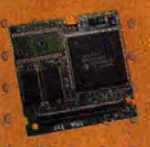

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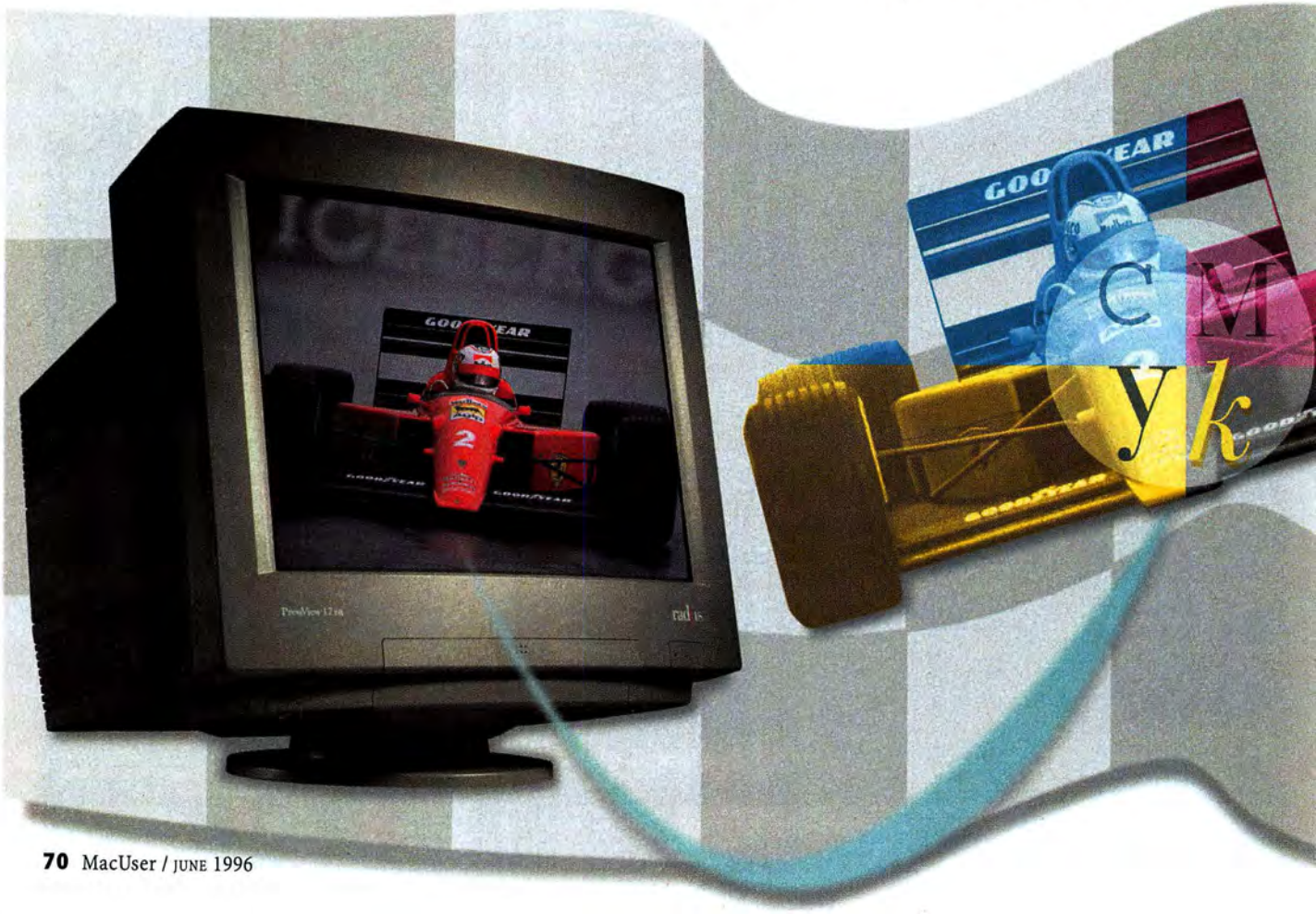
FORMULA 1

Adobe Photoshop power users always want more speed. Here's how to get it.

BY BRUCE FRASER

Working with large files in Photoshop can often make you feel like you're behind the wheel of a four-cylinder family hatchback rather than a Formula 1 race car — no matter how speedy your Mac is. Photoshop use involves millions of pixels, and pushing those pixels around taxes the Mac to its limits. Manipulating even a relatively small image, such as a 4-x-5-inch color photograph, can slow your Mac to a crawl while it processes the data. When you start dealing with larger images, such as magazine covers or posters, the sheer volume of data presents a formidable challenge to even the most powerful Mac.

If you're aiming to produce high-quality images, you



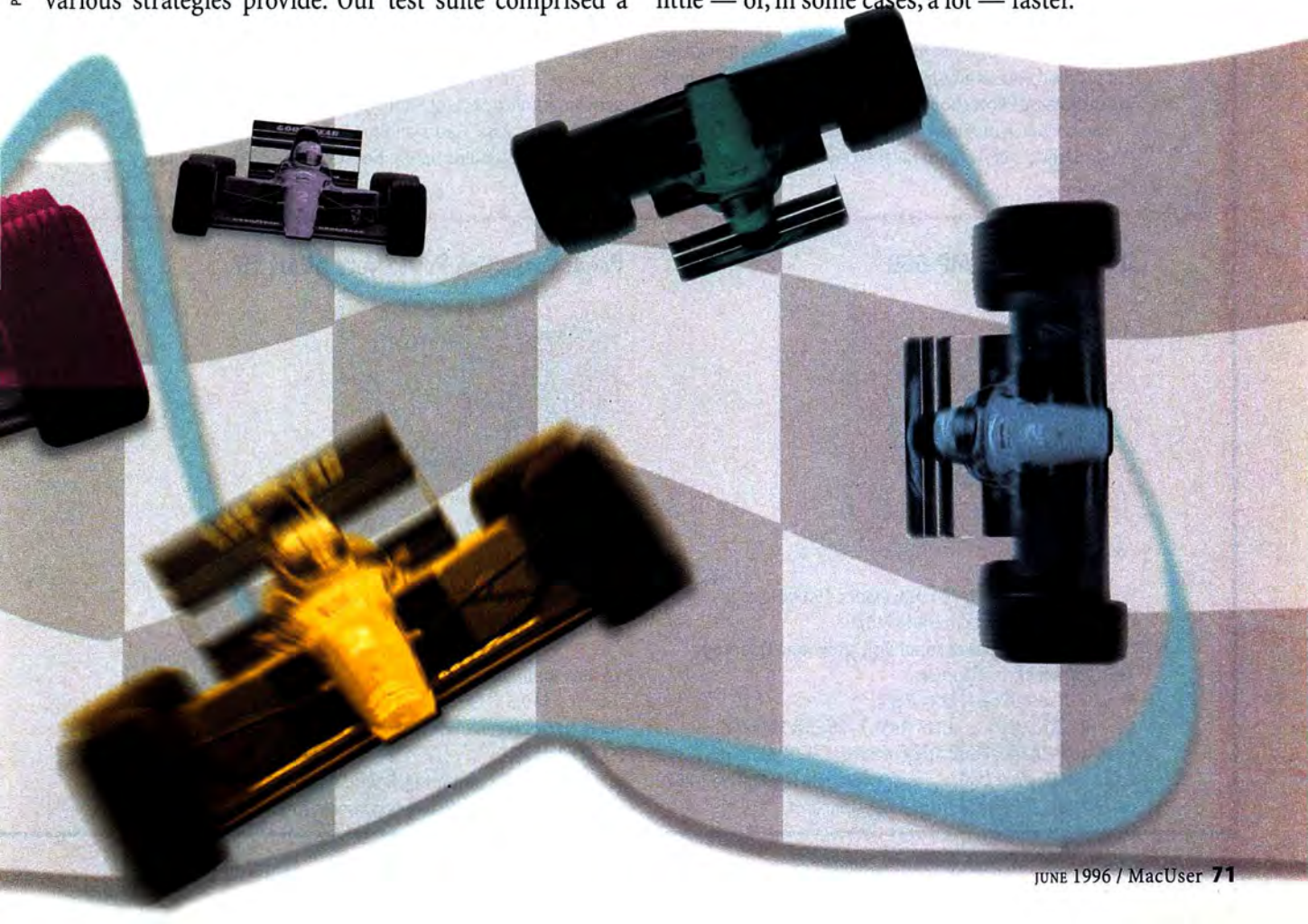
PHOTOSHOP

really can't afford to cut down the amount of data you're dealing with (by abandoning color or by using smaller image sizes) just to run Photoshop more efficiently. So what can you do to make your Mac run Photoshop at Formula 1 speeds? Is it as simple as pumping up the amount of RAM? Or should you install a DSP (digital signal processor) accelerator? Or get a RAID array? Or employ a combination of all three? Does the ultimate solution lie in multiprocessing?

To find the best approach to building a lean, mean Photoshop racer, MacUser Labs devised a demanding set of tests to quantify just how much of an improvement various strategies provide. Our test suite comprised a vast range of operations in Adobe Photoshop 3.0.5 (see the "Pit Stop" sidebar). We rounded up four fast Mac OS systems, three PCI-based and one NuBus-based, and ran them through their paces, using a 50-MB, 5,125-x-3,413-pixel color image.

We also looked at how we could speed up the machines, using DSP acceleration and hard-disk arrays. To round out our benchmark suite, we tested the conventional wisdom that claims that RAM is the single biggest factor affecting Photoshop speed. In the end, we came up with a good picture of how quickly various Mac OS systems can run Photoshop and what you can do to make them run a little — or, in some cases, a lot — faster.

PHOTOGRAPHY/GIAMPIERO BENVENUTI



STOCK-CAR RACING

For the first time ever in a MacUser Lab report, the two fastest Mac OS systems we tested weren't made by Apple. As we expected, our test results showed that our stock configurations, when equipped with sufficient RAM (3.5 times the test file's size), generally ranked in order of CPU horsepower, with the DayStar Genesis MP 600 and its four 150-MHz PowerPC 604 processors finishing first, followed by Power Computing's PowerWave 604/150, the Apple Power Mac 9500/132, and then the Apple Power Mac 8100/100.

For operations that took more than a few seconds, the DayStar machine was by far the fastest. The Genesis MP 600's four processors helped it zoom along when processing filters (Unsharp Mask, Gaussian Blur, and Despeckle) and performing mode-change and resizing operations. The runner-up, the PowerWave 604/150, took about three times as long on these operations.

The few exceptions occurred mostly for shorter operations, such as loading selections, when the single-processor PowerWave 604/150 and Power Mac 9500/132 finished fractions of a second ahead of the Genesis MP 600. For rotates — functions that simply involve moving data — the Genesis MP 600 was disappointing. In the Rotate 90 Degrees test, it finished fractionally behind the PowerWave 604/150 and the Power Mac 9500/132, but in the .3-Degree Arbitrary Rotate test, it trailed the PowerWave 604/150 by over eight seconds.

In short, given enough RAM, a fast processor runs Photoshop faster than a slow one and, in most cases, four processors can be well over three times better than one. The bottleneck the Genesis MP 600 seems to face for the shorter operations is simply in transferring the data from RAM to the four hungry PowerPC 604 processors. It uses the same physical memory architecture as the PowerWave 604/150 and the Power Mac 9500/132, so for operations that consist almost entirely of moving data, such as channel switching, it can't go any faster than the memory bus allows. But the tables are turned for computation-intensive tasks, such as changing modes or resizing. In these cases, the bottleneck lies in performing calculations, so when the four processors kick in, they provide a hefty speed boost.

A DSP TURBOCHARGER

Adaptive Solutions' PowerShop DSP accelerator card uses multiple DSPs to speed up several specific Photoshop operations. The PowerShop can cause certain math-intensive functions to zip along — for

PIT STOP / how we tested

To find the most efficient way to speed up Adobe Photoshop 3.0.5, we ran a series of tests on various configurations of four Mac OS systems. The four were a multiprocessing DayStar Genesis MP 600, a Power Computing PowerWave 604/150, an Apple Power Mac 9500/132, and an Apple Power Mac 8100/100. We debated whether to include a 68040-based machine, but the first piece of advice we'd give any Quadra owner looking to increase Photoshop speed is to trade up to a Power Mac.

We used each platform in its stock configuration (see "The Playing Field," below, for details) except for installing enough RAM to allocate 178.3 MB to Photoshop — sufficient to handle the 50-MB RGB TIFF file we used for our tests. After running each test with a RAM configuration of 3.5 times the file size, we reduced the RAM to 75 MB (1.5 times the file size) and repeated a representative subset of the tests in order to measure the effect of low RAM on Photoshop's speed.

Our test suite involved performing 17 functions that benchmark all aspects of Photoshop speed, including not just the Unsharp Mask, Gaussian Blur, Rotate, and Resize operations but also blending operations such as using the Calculate

THE PLAYING FIELD

DayStar Genesis MP 600

Processors: 4 PowerPC 604 processors, 150 MHz each.
Graphics Card: ATI Xclaim GA (4 MB).
Hard Drive: 4-GB dual-channel disk array (one Quantum XP32150 on each channel).
Monitor: Radius PressView 17 SR.
List Price: $16,000 (32 MB of RAM, 1-GB Fast SCSI-2 drive, 4-GB dual-channel disk array, internal CD-ROM drive).
Company: DayStar Digital, Flowery Branch, GA; 800-962-2077 or 770-967-2077; http://www.daystar.com/.

Power Computing PowerWave 604/150

Processor: 150-MHz PowerPC 604.
Graphics Card: IMS TwinTurbo-128M.
Hard Drive: 1.7-GB Micropolis drive.
Monitor: Radius PressView 17 SR.
List Price: $10,577 (176 MB of RAM, 2-GB hard drive, 64-bit PCI graphics accelerator with 2 MB of VRAM, internal CD-ROM drive).
Company: Power Computing, Round Rock, TX; 800-405-7693 or 512-388-6868; http://www.powercc.com/.

GAME PLAN / 6 surefire ways to accelerate Photoshop

Photoshop users are always looking for faster ways to work, but squeezing every ounce of speed out of Photoshop takes a calculated effort. The type of work you do regularly will be your most important guideline for devising a strategy.

JOB DESCRIPTION	STRATEGY
Perform general Photoshop work.	Add more RAM, if needed (see the "RAM Horsepower" sidebar).
Primarily use Unsharp Mask, Gaussian Blur, Rotate, and Resize operations.	Add a PowerShop accelerator card.
Same as previous but also use disk-intensive programs, such as QuarkXPress or PageMaker.	Add a PowerShop accelerator card and a RAID disk array.
Perform general Photoshop work plus frequently perform computation-intensive tasks (resizing, filters, mode changes).	Upgrade your Mac to one with a faster processor.
Same as previous, but money is no object for the ultimate in speed.	Buy a Genesis MP 600.
Work with huge image files that exceed even the heftiest amounts of RAM.	Add a RAID disk array.

example, filters that take a radius setting, such as Unsharp Mask and Gaussian Blur — but other functions aren't affected. We tested the PowerShop's effect on the NuBus system as well as the PCI systems.

Installing a PowerShop can give you Genesis MP 600-level speed. In most tests, the PowerShop-accelerated machines were slightly faster for rotates and for feathering selections than the Genesis MP 600. This held true even in the case of the Power Mac 8100/100 — the NuBus version of the PowerShop was only marginally slower than the PCI version. But the Genesis MP 600 remained the undisputed champion when we ran the Despeckle filter, performed mode command and using Apply modes with layers. We also looked at switching channels, loading and feathering selections, making tonal corrections with the Levels command, converting from RGB to CMYK color mode, and opening files.

We then tested the single-processor machines with a DSP accelerator, Adaptive Solutions' PowerShop, installed. We ran all the tests with high-RAM configurations and our subset of tests with low-RAM configurations too. Regardless of your system's RAM configuration, the bottom line is this: Having high RAM helps the PowerShop a lot. But even if you don't have a lot of RAM, a system with the card installed still smokes compared to one that doesn't have a PowerShop at all.

We also ran tests to see if using a disk array was beneficial. We added a 6-GB Fast-and-Wide RAID Level 0 array that used a single-channel SCSI-2 card to all the single-processor systems and ran the subset of our test suite. We also checked to see if using both an array and a DSP accelerator reaped even greater benefits, but we found that there is often no advantage to using both — and sometimes it can actually slow Photoshop down (see the charts in "Fueling Photoshop").

Apple Power Macintosh 9500/132

Processor: 132-MHz PowerPC 601.
Graphics Card: ATI Xclaim GA (4 MB).
Hard Drive: 2-GB internal drive.
Monitor: Radius PressView 17 SR.
List Price: $4,599 (16 MB of RAM, 2-GB hard drive, internal CD-ROM drive).
Company: Apple Computer, Cupertino, CA; 800-767-2775 or 408-996-1010; http://www.apple.com/.

Apple Power Macintosh 8100/100

Processor: 100-MHz PowerPC 601.
Graphics Card: Apple VRAM Card.
Hard Drive: 1-GB internal drive.
Monitor: Radius PressView 17 SR.
List Price: $3,099 (16 MB of RAM, 1-GB hard drive, internal CD-ROM drive).
Company: Apple Computer, Cupertino, CA; 800-767-2775 or 408-996-1010; http://www.apple.com/.

FUELING PHOTOSHOP / speed strategies and how they fared

AMOUNT OF RAM
3.5x FILE SIZE
1.5x FILE SIZE

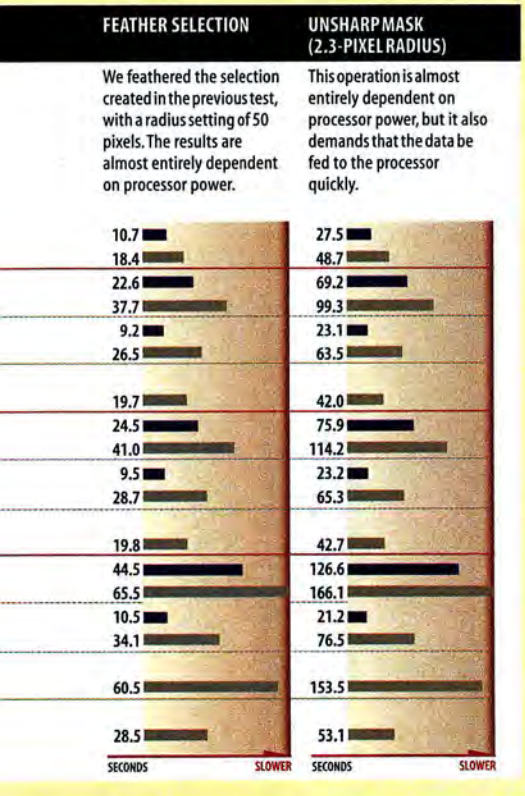
	OPEN LEVELS	APPLY LEVEL CHANGE	ROTATE IMAGE .3 DEGREE	GAUSSIAN BLUR (1-PIXEL RADIUS)	GAUSSIAN BLUR (2.3-PIXEL RADIUS)
	Before the Levels dialog box appears, Photoshop must create a histogram. The Genesis MP 600 is handicapped by having to parcel out the data to four processors.	Changing the black input level to 20 and the gamma setting to 1.8, Photoshop recalculates each pixel's value, so speed depends on processor power.	This task requires heavy computation, particularly when you use bicubic resampling. The Genesis MP 600 did poorly due to the overhead of sending data to four processors.	This filter uses one of three algorithms. The results demonstrate each system's speed for a radius of approximately 1 pixel.	Systems with the PowerShop are the winners in this test, even beating the Genesis MP 600, despite its multiprocessing power.
DayStar Genesis MP 600	3.9	3.7	60.2	12.1	24.4
Power Computing PowerWave 604/150	3.5	4.7	51.6	34.1	59.3
with PowerShop	3.4	4.7	25.3	16.4	20.8
Apple Power Mac 9500/132	3.8	4.7	75.6	20.5	64.1
with PowerShop	3.9	5.1	25.9	16.2	21.2
Apple Power Mac 8100/100	5.3	5.8	83.6	38.2	111.9
with PowerShop	5.4	6.6	25.4	17.3	21.9
	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER

	GAUSSIAN BLUR (100-PIXEL RADIUS)	DESPECKLE	MODE CHANGE	RESIZE 50%	LAYERS
	The Genesis MP 600 executes the small- and large-radius algorithms more efficiently than the systems with the PowerShop.	This filter removes moiré and noise from scans and halftones, and its speed is dependent on processor power.	We converted an RGB image to CMYK. The stock Power Mac 9500/132 and PowerWave 604/150 can each run the algorithm as fast as the PowerShop-accelerated ones.	Resizing is strictly dependent on processor power. The Genesis MP 600 and the systems with the PowerShop performed this operation at almost the same speed.	We changed the Apply mode of a duplicate of the Background layer to Screen. This operation depends on processor speed and secondarily on data-moving capability.
DayStar Genesis MP 600	40.3	16.1	11.1	9.2	6.0
Power Computing PowerWave 604/150	100.8	46.8	27.1	26.6	9.2
with PowerShop	47.2	40.1	27.4	9.2	9.2
Apple Power Mac 9500/132	111.2	52.8	31.0	32.9	9.2
with PowerShop	47.6	41.2	30.8	9.1	10.0
Apple Power Mac 8100/100	208.9	125.0	70.8	50.5	11.3
with PowerShop	48.9	40.6	54.3	9.8	12.7
	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER

	OPEN FILE	ROTATE 90 DEGREES	CALCULATE: SCREEN	SWITCH CHANNELS	LOAD SELECTION
	The speed of this action depends on the speed of the hard-disk system.	This test is simply a matter of moving data. No computation is involved, and the PowerShop actually causes a slowdown.	We set Source 1 to red, Source 2 to green, and Blending to Screen. This function is almost entirely processor-dependent.	We changed the display from the new channel of the previous test to the RGB channel. This function depends largely on scratch-space-to-screen data movement.	We timed how long it took to load, as a selection, the new channel created by using the Calculate command. The top five configurations are separated by only one-fifth of a second.
DayStar Genesis MP 600	9.6	5.9	3.9	1.0	1.8
	9.6	30.1	3.7	6.3	5.7
Power Computing PowerWave 604/150	11.7	5.1	4.5	1.1	1.7
	11.5	38.8	4.1	10.6	8.0
with PowerShop	11.7	5.0	4.5	1.0	1.8
	11.7	53.8	4.6	13.0	8.3
with PowerShop and 6-GB Fast-and-Wide array	8.9				
	9.1	28.8	4.5	10.1	6.8
Apple Power Mac 9500/132	11.1	5.4	4.5	0.9	1.6
	11.6	42.8	4.5	11.1	7.5
with PowerShop	11.4	5.6	5.0	1.3	1.8
	11.4	61.8	5.0	14.4	9.2
with PowerShop and 6-GB Fast-and-Wide array	9.8				
	9.9	29.4	5.0	10.4	6.8
Apple Power Mac 8100/100	14.7	5.9	5.3	1.2	2.2
	14.7	50.2	5.3	14.4	9.9
with PowerShop	15.1	6.8	6.2	1.9	2.4
	15.0	68.1	6.3	17.5	11.0
with 6-GB Fast-and-Wide array	11.6				
	11.7	31.7	5.3	12.6	8.2
with PowerShop and 6-GB Fast-and-Wide array	12.4				
	12.4	45.2	6.3	17.8	10.9
	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER

Adding more RAM, a PowerShop card, a hard-disk array — all are possible ways to get every ounce of speed out of Photoshop. But just what exactly are the benefits of each? And which fit best with the platform you're using? To find out, we configured our four test Mac OS systems — a DayStar Genesis MP 600, a Power Computing PowerWave 604/150, an Apple Power Mac 9500/132, and an Apple Power Mac 8100/100 — in various ways and performed several Photoshop tasks. Our tests ranged from performing rotations, to selecting an RGB channel, to running filters.

The amount of RAM allocated to Photoshop is key. We ran all the tests with a RAM configuration of 3.5 times the test-file size. We then reran all the tests after installing an Adaptive Solutions PowerShop DSP accelerator in the Power Computing and Apple machines. For a subset of our tests, we used a low-RAM configuration of 1.5 times the test-file size. We also used the subset to see the effect of adding a RAID array and a PowerShop in the single-processor systems.



changes, and used two of the three Gaussian Blur algorithms.

The bottom line? If your work is slowed by time-consuming Unsharp Mask, Gaussian Blur, Rotate, or Resize operations, installing a PowerShop will make a huge difference. But keep in mind that the Genesis MP 600 multiprocessing machine speeds up *everything* in Photoshop — something the PowerShop doesn't do.

RAM CONSUMPTION

As we said before, the single most important thing you can do to make Photoshop run fast is to give it enough RAM (see the "RAM Horsepower" sidebar). So we ran a representative sample of our tests allocating Photoshop only 75 MB of RAM, or 1.5 times the size of the file we were using, rather than the 178.3 MB we used for our high-RAM testing. The results of these tests need some careful interpretation: If you simply look at the numbers, you may get an unrealistically rosy picture.

When Photoshop doesn't have enough RAM to work in, it uses a scratch file on the hard disk, causing a considerable slowdown. The two tests that dramatically illustrate this involve switching channels and loading a selection. With Photoshop running entirely in RAM, all the machines complete both these operations in about two seconds or less. With Photoshop using the scratch space on the hard disk, even the mighty Genesis MP 600 took about six seconds to complete the same operations and the Power Mac 8100/100 took about twice as long. The difference has almost entirely to do with the time it takes Photoshop to read the data from the disk and paint it onto the screen, resulting in agonizingly slow screen redraws with low RAM.

Lengthier operations are also adversely affected by low RAM, as shown by the results for feathering a selection and running the Unsharp Mask filter. But the key point to bear in mind is that almost anything you do in Photoshop that triggers a screen redraw will result in a fairly lengthy delay while Photoshop sends the data to the screen. This is not something a faster graphics card can help, because the bottleneck isn't in *displaying* the pixels; rather, it's in *reading* the pixels from RAM (or in the case of low RAM, from the scratch space on-disk).

We also looked at the effect on PowerShop-equipped systems when Photoshop is forced to use the hard disk. The PowerShop still provides considerable acceleration, but it doesn't give anything like the bang for the buck it supplies when Photoshop is running entirely in RAM.

When you run out of RAM, the speed of the hard drive becomes the determining factor in overall Photoshop speed. The Genesis MP 600 comes equipped with a Fast-and-Wide SCSI-2 RAID Level 0 array, so it took less of a speed hit than the other machines, which were equipped with a single fixed hard drive. The SCSI bus in the Power Mac 8100/100 is slower than that in the PowerWave 604/150 or the Power Mac 9500/132, so the Power Mac 8100/100 suffered the most. We saw almost no difference between the PowerWave 604/150 and the Power Mac 9500/132 when running in the low-RAM configuration — the small difference in processor power is masked by the drive speed, which is identical for the two machines.

HARD DRIVIN'

This led us to our final tests, which were designed to show whether use of a Fast-and-Wide array compensates for lack of RAM. We repeated a subset of our tests on the Power Mac 8100/100 after

equipping it with a 6-MB RAID Level 0 array. We built the array by using an FWB JackHammer SCSI-2 card and three 2-GB Seagate Barracuda drives.

Drive speed is important when you're opening and saving files, but if you have enough RAM, it has no effect on other aspects of Photoshop speed. When we compared the times taken by the array-equipped machines and those with a single fixed hard drive for lengthier operations, the array seemed to provide a significant improvement. But what these numbers don't show is how much of the time is spent on the screen redraws that accompany almost every

RAM HORSEPOWER / how much RAM is enough?

EXPERTS WILL TELL YOU that you need between 3 and 5 times the file size in RAM to keep Photoshop from using scratch space on your hard disk. But if you're dealing with a 50-MB image, the difference between three times the file size and five times the file size represents a serious investment. So how much RAM do you really need?

You don't need three times the file size for performing simple operations on an entire image. You actually need a little more than double the file size, because Photoshop stores only two copies of the image — the original and the new, edited one — and it also needs a small amount of additional RAM for carrying out the operations themselves. This rule holds true for almost any global operation, whether it's running a filter or making global changes such as adjusting the Levels, Curves, or Hue/Saturation values.

THE RAM REQUIREMENTS go up if you manipulate a selection, because a selection in Photoshop uses an 8-bit channel. A large selection that's almost the size of the entire image takes up nearly the same amount of RAM as the image itself if it's grayscale, one-third if it's RGB or Lab, or one-quarter if it's CMYK. For example, if you run a filter on a large selection from a 50-MB grayscale image, here's how to calculate the amount of RAM you'll need:

EQUATION 1: GRAYSCALE MODE

original image size (50 MB)

size of selection for mask (~17 MB)

size of final edited image (50 MB)

\+ RAM to run functions

= about 125 MB, or 2.5 times the size of the original image

When you're working in color, the requirements are proportionally less, because the selection mask, which uses a single 8-bit channel, is only a third or a quarter the size of the image.

IF YOU FLOAT THE SELECTION, the RAM requirements increase, because Photoshop has to keep five separate images in RAM. The calculation for a 50-MB file would be as follows:

EQUATION 2: RGB MODE

original image size (50 MB)

size of floating selection for mask (~17 MB)

size of original contents of floating selection (50 MB)

size of new contents of floating selection (50 MB)

size of final composite image (50 MB)

\+ RAM to run functions

= about 225 MB, or 4.5 times the size of the original image

In color modes, all the elements except the mask for the floating selection are full-color copies, so the total RAM requirement still adds up to more than four times the image size.

After you've opened a file in Photoshop, the numbers at the lower left corner of the window can be set to show scratch space.

move when you run out of RAM. Using an array can lessen the pain a little, but it's clearly no substitute for sufficient RAM.

We ran our subset of tests one final time to see if any benefits resulted from using both a RAID array and a PowerShop DSP accelerator (see the "Fueling Photoshop" sidebar).

AN EVEN MORE MEMORY-DEMANDING situation arises when you paint with a pattern on a floating selection, using a 50-MB file:

EQUATION 3: RGB MODE

original image size (50 MB)

size of floating selection for mask (~17 MB)

size of original contents of floating selection (50 MB)

size of mask for paint stroke (~17 MB)

size of pattern data (50 MB)

size of new contents of floating selection (50 MB)

size of final composite image (50 MB)

\+ RAM to run functions

= about 290 MB, or 5.8 times the size of the original image

IF YOU WORK IN BITMAP (1-bit black-and-white) mode, the RAM requirements relative to file size can be more extreme, because selections always use 8-bit channels. The overhead of adding layers to a document is a little higher than adding floating selections, but the principle is quite similar.

You can monitor the amount of scratch space Photoshop is using by setting the pop-up menu at the lower left of the image window to show Scratch Sizes (see figure at left). The first number is the amount of scratch space actually being used, and the second is the total amount of RAM Photoshop has at its disposal. As long as the first number is smaller than the second, Photoshop is working entirely in RAM. If you leave the thumbnails in the Channels and Layers palettes turned on, you'll hear occasional disk access, because Photoshop 3.0 continually optimizes its scratch file on-disk in the background. These occasional bursts of drive activity have no effect on Photoshop speed.

PHOTOSHOP SPEED TUNING

The lesson from all the tests taken together is that the conventional wisdom about RAM requirements is indeed correct, with a few caveats. Once Photoshop starts relying heavily on the scratch space on-disk, speed drops precipitously — the most noticeable effect being lengthy screen redraws.

But we said there are some caveats, and they mostly involve the amount of RAM you need. If you're working in a repetitive production environment, where most of your work involves opening, rotating, resizing, sharpening, and saving images, you should do well with a RAM configuration of 2.5 to 3.5 times the file size. For more-complex functions, you'll need more than 3.5 times the file size in RAM — in some cases, you may even need a RAM configuration of almost 6 times the file size (see the "RAM Horsepower" sidebar).

You should also consider the needs of your other applications. Few of them need the amount of RAM Photoshop does when it handles large files. If you spend much time working in such applications as QuarkXPress and PageMaker, each of which is heavily dependent on drive speed, adding an array may be a better overall investment than another 64 MB of RAM. And if the Photoshop files you work on are so large that it's physically impossible to install enough RAM in your machine, using an array will speed things up significantly.

WHAT ARE YOUR OPTIONS?

Whether you're in the market for a new Photoshop machine or are trying to soup up your existing system, the first thing you should do is spend some time analyzing your work. Look at the size of the files you typically work with. Then think about what you do with these files, to get an idea of how much RAM you really need — if you mostly do color correction and global filtering, the amount may be less than you think (see the "RAM Horsepower" sidebar).

The Genesis MP 600 is the ultimate Photoshop machine, but a machine like the one we tested costs about $16,000. If you work with Photoshop full-time, though, the DayStar machine may quickly pay for itself — it can perform some functions two or three times as fast as an unaccelerated PowerWave 604/150 equipped with lots of RAM. The speed increase Photoshop gets from DayStar's multiprocessing technology is impressive, but as yet, few other applications besides Photoshop support multiprocessing. The Genesis MP 600 runs most applications at the speed of a PowerWave 604/150, still pretty respectable. If you work with huge files and have enough money to throw at the Photoshop-speed problem, you can stuff enough RAM (up to 1.5 GB) into the Genesis MP 600 to give Photoshop 1,000 MB, the maximum applications can currently use under the Mac OS.

For some people, adding a DSP accelerator may make more sense than upgrading to a faster machine. If you spend a lot of time waiting for Unsharp Mask or Gaussian Blur filters, installing a DSP accelerator will let your system run the filters pretty much as fast as the fastest machine going. For others, upgrading to a whole new, faster Mac OS system may be a better option, because a DSP accelerator speeds up only selected functions whereas using a faster CPU speeds up everything. Using a RAID array is something of a luxury for Photoshop use, but it can do wonders for applications such as QuarkXPress and PageMaker and for handling extremely large files.

Contributing editor Bruce Fraser is coauthor of *Real World Photoshop 3.0*, published by Peachpit Press. MacUser Labs' senior project leader Jeffrey K. Milstead managed the testing for this report.

MODEL programs

Today's sophisticated 3-D software lets you create your own realistic-looking worlds. On the seventh day, don't forget to rest.

By David Biedny and Nathan Moody

WITH THE SMASHING SUCCESS of its movie, *Toy Story,* the Pixar/Walt Disney collaboration proved that computer-generated three-dimensional worlds *can* take on a life of their own. Granted, *Toy Story* was created using custom Pixar code and rendered on 100 Sun workstations, but Mac 3-D artists need not despair. With a little savvy and the right tools, you too can create many of the effects seen in *Toy Story.*

The good news is that a wide array of general-purpose 3-D software is now available for the Mac, but picking the right software tools can be a daunting chore, especially for those just getting started. Even expert users looking to expand their existing arsenals may have a hard time deciding which 3-D tools to acquire next. So we've gathered all the packages together and scrutinized their strengths and weaknesses for modeling, rendering, and animation. Not all the packages provide tools for all three tasks, so some users may end up combining packages to complete their 3-D tool sets.

One word to the wise before we begin: If you plan to do any amount of serious 3-D work, get a Power Mac. You'll need all the speed and power you can afford to run these CPU-intensive programs at an acceptable speed. And all the programs reviewed here have been enhanced to take full advantage of the PowerPC processor. Furthermore, Apple's QuickDraw 3D technology, which promises to provide instantaneous shaded previews of your 3-D scenes (a feature previously available only on expensive workstations) works only on Power Macs. It's true that at review time, only two of the packages supported Apple's new technology, but we expect that most, if not all, of the remaining programs will add QuickDraw 3D support in the coming months.

ILLUSTRATION / TOM WHITE

MODELING

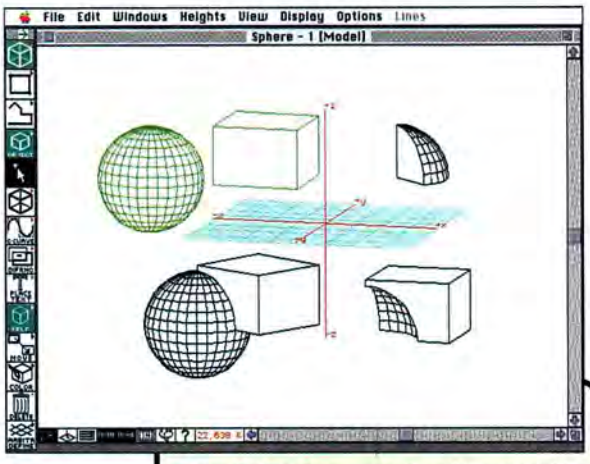
The first step in creating a 3-D world is modeling the objects, using a combination of 2-D and 3-D tools, and arranging them into scenes. To assemble complex models, you link groups of shapes into parent-child hierarchies. It's also at this stage that you create textures and apply them to object surfaces. Basic features to look for vary according to your expertise. Novices will want a good selection of premade primitive objects — pyramids, cylinders, spheres, cubes, and the like — to help them get started. Most users, no matter what their level of expertise, will want to be able to extrude type to create 3-D logos. And experts will appreciate an advanced set of spline-based drawing tools for creating smooth surfaces, as well as the ability to enter precise numerical parameters for objects.

Tailor-made for hobbyists and 3-D newcomers, Ray Dream's Ray Dream Studio and Specular's Infini-D each offer a complete and accessible tool set for 3-D modeling, rendering, and animation. Each provides a solid selection of primitives. Ray Dream Studio can even help you create more-complex shapes, such as goblets and spirals, with its Modeling Wizard, which prompts you every step of the way as you create your objects. There's also a Scene Wizard for creating instant indoor and outdoor environments.

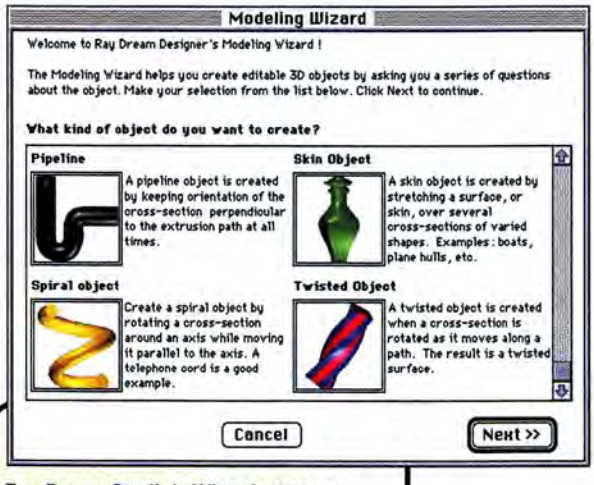
Infini-D's claim to fame, in addition to an easy-to-use interface, is being one of the first packages to support Apple's QuickDraw 3D technology. QuickDraw 3D lets you experiment freely with your scenes, because you can see the results of your actions in real time rather than having to wait for the software to render the images. For example, as you move a light around in a scene, the effects of the light appear to update in real time.

Novices and experts alike will appreciate Ray Dream Studio's and Infini-D's spline-based drawing tools and the ability to lathe, extrude, and loft objects that both programs provide. Each also has basic tools for linking objects and creating parent-child relationships between them.

Strata's Vision 3d lags behind Infini-D and Ray Dream Studio in modeling prowess. For example, although Vision 3d supports Boolean operations — which allow you to create complex shapes by adding objects to or subtracting them from one another — the results of the operations are often compromised by inaccuracies. And although Vision 3d can import EPS outlines to use for extrusions, we encountered problems with compound EPS files, which Infini-D and Ray Dream Studio handled flawlessly. A Vision 3d strength, on the other hand, is its arsenal of drawing tools for creating 2-D shapes to be used for 3-D extrusions.



Powerful Boolean operations let you combine objects in complex ways. Shown in this form•Z screen are the results of performing three Boolean operations on a box and a sphere — clockwise from the two objects are the results of an intersection, a difference, and a union.



Ray Dream Studio's Wizards step you through a variety of 3-D tasks, which makes the program a good choice for hobbyists and 3-D newcomers.

Vision 3d's more sophisticated and pricier sibling, StudioPro Blitz, is the other package that supports QuickDraw 3D. It allows vertex-level editing, which provides more-exacting control over an object's shape than what you get with Infini-D or Ray Dream Studio. The package also includes intuitive Bézier-curve controls for manipulating object surfaces.

StudioPro Blitz is loaded with features. In fact, it almost tries to do too much, so the quality of its work suffers somewhat. It provides Boolean operations and the Metaballs effect, which lets you create unusual organic shapes by joining spheres that resemble drops of mercury. You'll also find this feature in the top-of-the-line ElectricImage Animation System (EIAS), but StudioPro Blitz's implementation can give you some very unpredictable results. That's because you don't have as much control over the process of joining the spheres as you do with the EIAS — a much pricier program that's a more suitable choice for 3-D professionals working in production environments.

Byte by Byte's Sculpt 3D and The Valis Group's PixelPutty Solo boast more-advanced modeling features. Each program supports vertex-level editing, as well as Bézier, B-spline, and NURBS (nonuniform rational Bézier splines) curves. Sculpt 3D provides object tessellation — the ability to reduce or increase the number of polygonal faces of an object — in addition to Boolean operations. The claim to fame of PixelPutty Solo is its object-editing and deformation tools, which operate in real time.

However, the flip side of each program's power is a steep learning curve. Sculpt 3D makes the learning process particularly tricky with its nonstandard naming conventions. PixelPutty Solo's tools are not as difficult to use as Sculpt 3D's — you can bend and twist an object by manipulating a single Bézier curve in three dimensions, for example — although Macintosh aficionados will need to spend time getting

PixelPutty Solo's implementation of Inverse Kinematics is especially powerful. Not only do the linked objects in a chain move in relation to one another but the skin covering the chain also moves, which makes the program a good choice for realistic-looking character animation.

used to PixelPutty's UNIX-like interface.

Also offering sophisticated tools but much easier to use than either Sculpt 3D or PixelPutty Solo is Macromedia's Extreme 3D. It provides not only an impressive set of 2-D drawing tools but also some of the most precise spline-based object-manipulation tools we've seen. What makes Extreme 3D so powerful is that it lets you control every object parameter (size, relative and absolute positioning, scale, and rotation) numerically. Extensive twist, taper, and bend tools round out the Extreme 3D modeling arsenal.

VIDI's Presenter Professional offers a comprehensive set of accurate modeling tools geared toward professionals. The power of its Boolean operations is eclipsed only by that of form•Z, and its ModelPro module boasts one of the most intuitive methods we've seen for manipulating objects. Called Digital Clay, it allows you to use spline curves between vertices to pull, stretch, and manipulate shapes with the pointer in much the same way you would model a real lump of clay with your fingers. But the version of Presenter Pro we used came up shorthanded in the software-stability department — we experienced screen-redraw problems and crashes as we tried to execute complex Boolean operations.

Alias Sketch! is a NURBS-based modeler, which means it provides the ultimate in accurate surface descriptions. That's why it excels at handling curved and organic shapes. Alias Sketch!'s roots in the Silicon Graphics workstation world are evident. The program provides extensive control of an object's vertices, beveling options equaled only by form•Z, extremely flexible object-deformation tools, and the ability to match the perspective of a scanned image to the background on which it's placed.

Without question, autodessys' form•Z delivers the ultimate in object-editing and modeling controls. Its precise tools make it the clear choice for anyone designing 3-D objects according to a detailed set of specifications — an exotic perfume bottle, for example, that combines numerous asymmetrical shapes. Vertices, segments, polygonal faces, and objects can all be selected and manipulated. Drawing features include line-segment and polygon drawing tools as well as NURBS, B-spline, and Bézier-curve tools. And form•Z boasts the most-powerful Boolean operations of all the packages we reviewed. However, even expert users will need to invest a significant amount of time learning the complexities of the program (the package includes three thick manuals).

Electric Image's pricey ElectricImage Animation System, best known for its feature-rich animator and broadcast-quality rendered effects, lacks a dedicated modeler. However, it offers a good selection of premade scalable objects you can manipulate with the system's deformation tools, as well as the Mr. Blobby plug-in, for Metaball modeling. To help compensate for its lack of full-blown modeling tools, the EIAS can directly import more 3-D-model formats than any other Mac program. And it handles very large models that would choke many of the other packages reviewed here, an important consideration for professional animators and producers. However, you need lots of RAM — the system requires at least 32 MB for big projects.

RENDERING

When the design of your 3-D scene is complete, you're ready to render the scene. The rendering process captures the view you've specified, complete with the objects you've modeled, the colors and textures you've applied to them, and the lighting. Think of rendering as taking a snapshot. If you decide you want a different view of your scene, simply move the camera's viewpoint and rerender the image. We've included our discussion of textures in this section, because it's your final rendering that brings out the full effect of the textures, even though you apply them during the modeling process.

Important features to look for in a renderer are the types of lighting a package provides, anti-aliasing quality, the rendering modes supported, and the control you have over the lighting. Wireframe, the most basic rendering mode, displays a detailed transparent polygonal view of an object. Flat-shading mode adds elemental color and opacity to wire frames. Gouraud mode smoothes out surface shading and renders basic textures. Phong mode ups the ante for smoothness and texture detail. Ray tracing, the most advanced mode, simulates the way light interacts with objects in a scene, providing shadows, transparency, and refractivity. Once your scene is rendered, you can print it or open it in another program.

Ray Dream Studio has powerful yet intuitive controls for creating procedural textures that simulate marble, wood, and other organic materials. One special feature only Ray Dream Studio has is the ability

SEAHORSE IMAGE / JOHNATHAN R. BANTA

For professional-level animation tools, no other program for the Macintosh comes close to the ElectricImage Animation System. Even special effects are animatable. The system's Mr. Nitro plug-in, used for creating the series of frames shown here, is one of the most powerful animated special-effects generators for the Macintosh. Based on a slew of parameters you set — including gravity, direction, turbulence, and fragment shape — it explodes objects into either tiny dustlike particles or giant pieces of glass.

to combine these textures within any given channel. Channels affect object characteristics such as shininess, roughness, reflectiveness, and glow. By combining textures within channels, you can create complex-looking surfaces, such as a fuzzy tennis ball with seams.

Infini-D also offers excellent texture-mapping controls. You can layer an unlimited number of images and textures to create custom surface compositions. Mapping modes let you control how layers interact, using blending, transparency, and masking. You can even use alpha channels for sharp compositing of one layer onto another. Infini-D's surface special effects — Wave Map, Bump Map, and Corrosion Map — can be animated as well as edited. A special feature is the ability to generate shadows in Phong mode, so you get great-looking results without having to wait for ray tracing.

Both Ray Dream Studio and Infini-D support Gouraud, Phong, and ray-trace rendering, but Ray Dream Studio is the only program available that doesn't require a floating-point unit for ray tracing, which makes it a good choice for owners of less powerful Macs. Infini-D boasts the ability to generate QuickTime VR panorama files — 3-D scenes in which you can spin the camera in real time.

Vision 3d and StudioPro Blitz surpass the lower-end packages in terms of rendering quality. StudioPro Blitz can render shadows in Phong mode, and its ray-tracing quality is outstanding. Like Infini-D, the program can render QuickTime VR panorama files.

Sculpt 3D's texture handling is unlike that of any other 3-D application: Each face of an object can have its own texture. But Sculpt 3D's cryptic interface can make it difficult for even expert users to tap the program's power. Complex curve controls for defining surface parameters such as reflection coefficients, specular characteristics, and diffuse color equations are particularly confusing. However, Sculpt 3D features some of the highest-quality rendering available on the Macintosh — the realistic-looking shadows it produces are particularly impressive.

PixelPutty Solo is probably best used as a source for organic models and not as a final rendering tool. The current version offers basic shaded rendered views and good support for MacRenderMan, but the program lacks extensive texture support. An upcoming release will address these shortcomings by adding a high-quality Phong renderer and improved texture controls.

Extreme 3D offers a workable set of built-in textures and good control over surface characteristics. An Extreme 3D strength is its excellent lighting controls, which let you create very realistic scenes. The program doesn't support ray tracing, but it does provide a speedy Phong renderer that produces excellent results. Gone is the MacRenderMan support found in earlier Macromedia 3-D products.

Like Infini-D, Presenter Professional allows you to layer multiple textures on a single object. However, you don't get the level of control Infini-D provides. For example, you can't define the amplitude of bump maps, so the depth of texture grooves generally remains the same. Presenter Pro supports ray tracing as well as output to MacRenderMan, and it boasts a number of esoteric features you won't find anywhere else. The program can produce autostereogram images (repeating patterns that hide a 3-D image), stereoscopic images (double images designed to be viewed through a stereoscope), and red-blue offset stereo images (images to be viewed with red-and-blue 3-D glasses).

Alias Sketch! features one of the best renderers on the Macintosh. With full ray-tracing support, it produces exquisite images with wonderful soft shadows, excellent reflection and refraction effects, and more. From within a single dialog box, you can precisely position bitmapped textures and preview the results. One notable drawback, however, is Alias Sketch!'s lack of procedural textures.

form•Z has basic rendering capabilities. If you need more power, you can opt to get the $1,995 RenderZone add-on, which offers more-sophisticated capabilities as well as an editor for

FEATURES OF 3-D

	ALIAS SKETCH
MODELING	
Vertex-level editing	●
Spline-based editing	●
Font extrusion and beveling	●
Skinning/lofting	●
Path sweeping/extruding	●
Boolean operations	
EPS file extrusions	●
Metaball modeling	
RENDERING	
Gouraud rendering	●
Phong rendering	●
Ray tracing	●
QuickTime VR support	
QuickTime texture maps	
QuickDraw 3D support	
Ambient lights	●
Distant lights	●
Point/spot lights	●
Atmospheric effects	
ANIMATION	
Editable motion paths	
Object morphing/deformation	
Keyframe control	
True particle effects	
Inverse Kinematics	
Editable velocity curves	

*Optional RenderZone add-on

modifying surface parameters. RenderZone works its rendering magic by using Gouraud, Phong, and ray-tracing modes and is one of the fastest ray tracers in its price range.

The king of rendering on the Macintosh is the ElectricImage Animation System. Despite its lack of support for ray tracing, its rendered images appear cleaner, richer, and more realistic than those produced by anything else on the Macintosh. In addition to rendering soft shadows, it provides excellent control over motion-blur effects and offers the most complete selection of surface controls of any Macintosh renderer as well as detailed feedback on the rendering process. Also noteworthy are video interlacing (crucial for professional video output), atmospheric effects, radiating-glow and ray effects from lights, and the ability to save rendering time by tweaking the anti-aliasing settings for a specific scene. And the EIAS' renderer is the fastest of all those reviewed here. An added bonus for production environments is the EIAS' new Renderama network rendering system, which speeds jobs by distributing them among Macintoshes and Silicon Graphics workstations.

ANIMATION

Animation tools add motion to your 3-D scenes. In addition to animating objects, several packages let you animate other aspects of a scene, such as the color of the lighting or object surfaces. Some programs provide morphing tools as well.

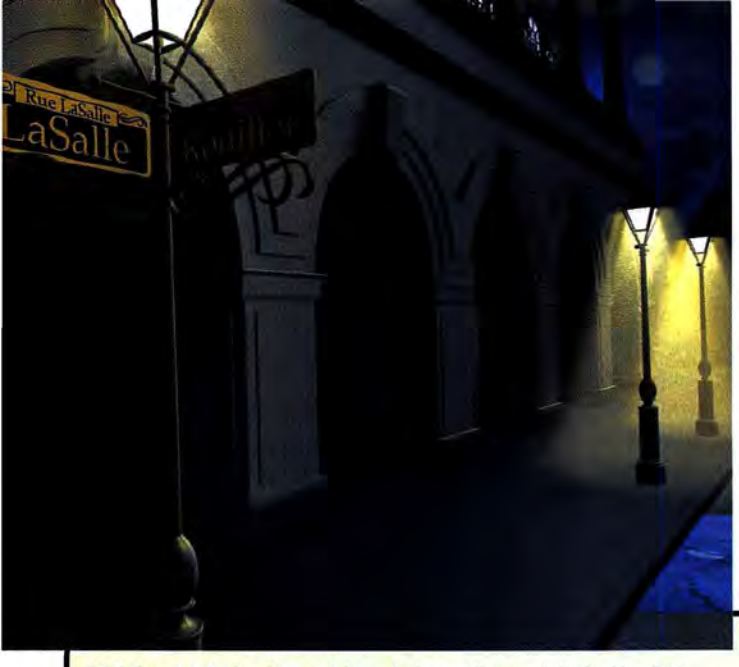
One of the most essential tools for animation is the timeline, which lets you see the state of every element in your scene over time. It displays the keyframes that show when and how elements change — for example, an object's position or the color of a light. You set the keyframes for your animation, and the software creates the in-between frames. A key differentiating factor among animation packages is the number of parameters you can change over time. Obviously, the more parameters you can change, the more sophisticated your animations will be. In addition, directly editable motion paths give you lots of control over how an object moves through a scene.

Ray Dream Studio boasts a set of well-designed animation tools. A timeline with keyframes provides exacting and intuitive controls over camera attributes as well as object animation. Although the program

SOFTWARE

	EIAS	EXTREME 3D	FORM•Z	INFINI-D	PIXELPUTTY SOLO	PRESENTER PROFESSIONAL	RAY DREAM STUDIO	SCULPT 3D	STUDIOPRO BLITZ	VISION 3D
		●	●		●	●		●	●	●
		●	●	●	●	●	●	●	●	●
	●	●	●	●		●	●	●	●	●
		●	●	●	●	●	●	●	●	●
		●	●	●	●	●	●	●	●	●
			●			●		●	●	●
		●		●	●	●	●	●	●	●
	●								●	
	●	●	●	●	●		●		●	●
	●	●	●	●	●	●	●	●	●	●
			*	●	†	●	●	●	●	●
				●					●	
	●			●		●	●		●	●
				●					●	
	●	●		●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●	●	●
	●	●		●	●	●	●	●	●	●
	●	●		●	●	●	●	●	●	
	●			●	●	●	●	§	●	●
	●	●		●	●	●	●		●	
	●	●		●	●	●	●		●	●
	●									
	●				●		●			
	●	◊		●	●	●	●	§	◊	◊

available for ray tracing. †Requires MacRenderMan for quality rendering. §Only the camera can be animated. ◊Ease-in/out, but no velocity curves.



Lighting controls play a major role in creating realistic-looking 3-D scenes. In this streetlight image created with Macromedia's Extreme 3D (left), the artist was able to simulate a smoky effect in the lighting by adjusting the program's turbulence and dustiness controls. A special feature of Strata's StudioPro Blitz is its powerful Raydiosity rendering mode, which produces near-photo-realistic shadowing and lighting effects, as in the image shown here (right), using calculations based on the energy sources in a scene.

doesn't let you edit motion paths, it does offer a basic implementation of Inverse Kinematics (IK), a crucial feature for character animation. With Inverse Kinematics, you can link objects hierarchically, specifying how they will move in relation to each other. For example, if you created a chain with Ray Dream Studio, moving one link of the chain would cause the other links to move as well.

Like Ray Dream Studio, Infini-D specializes in animation tools that are easy to use, but Infini-D's are somewhat more powerful than Ray Dream Studio's. You can animate object position, rotation, scale, center-point, and surface parameters over time as well as morph between dissimilar shapes. Infini-D also provides Bézier curves — familiar tools to anyone who's used FreeHand or Illustrator — that let you control the velocity of changes in an object's position and rotation. The beauty of Bézier-based controls is that they let you vary speed in a nonlinear fashion, so an object can speed up, slow down, and then speed up again. Other useful features include directly editable motion paths and a red line that appears between keyframes when Infini-D spots a problem — for example, when an object's velocity won't take it the distance it must travel in a set time. Animation assistants automate keyframe placement and help generate special effects, including Spin, Reverse, Mirror, Explode, Auto-Bank, and Align to Motion.

StudioPro Blitz's keyframe-based tools work well for simple animations, but we encountered problems with keyframes that sometimes didn't appear where expected. Animation assistants for special effects (Explode, Shatter, Atomize, and Warp) are dynamic and fun, but the results aren't as sophisticated as those you get with the EIAS's true particle effects. With the exception of these animation assistants and effects, Vision 3d's animation capabilities are comparable to StudioPro Blitz's.

RATING	PRODUCT	PRICE*	TASK	SUMMARY
🖱🖱🖱🖱	EIAS	$7,495	RA	Top-notch animation tools. Extensive special-effects and model-import support. Pricey.
🖱🖱🖱🖱	Extreme 3D	$699	MRA	Precise modeling tools. Well-designed interface. Good rendering and animation quality.
🖱🖱🖱🖱	form•Z	$1,495	MR	Top-notch modeling tools. Powerful Boolean operations. Steep learning curve. Optional renderer.
🖱🖱🖱🖱	Infini-D	$899	MRA	Accessible. Full-featured. Excellent modeling and texture tools. Good animation controls.
🖱🖱🖱🖱	Ray Dream Studio	$499	MRA	Accessible. Full-featured. Excellent modeling and texture tools. Competitively priced.
🖱🖱🖱½	StudioPro Blitz	$1,495	MRA	Full-featured. Sophisticated tools. Inconsistent results.
🖱🖱🖱	Alias Sketch!	$695	MR	Advanced spline-based modeler. Excellent rendering quality. Lacks procedural textures and animation tools.
🖱🖱🖱	PixelPutty Solo	$399	MRA	Powerful modeling tools for the price. UNIX-like interface. Lacks advanced rendering and animation features.
🖱🖱🖱	Presenter Professional	$1,995	MRA	Professional-level modeling tools. 3-D-sound animation. Animation tools not integrated with modeler.
🖱🖱🖱	Sculpt 3D	$499	MR	Excellent modeling and rendering tools. No animation besides fly-throughs. Steep learning curve.
🖱🖱🖱	Vision 3d	$695	MRA	Low-end version of StudioPro Blitz. Not as powerful as comparably priced packages.

*List price.

M=modeling R=rendering A=animation

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

A good choice for character animation is PixelPutty Solo. The program's best animation feature is its simple but effective implementation of Inverse Kinematics. The program supports a limitless number of hierarchical links — you can even add variable object deformations to the hierarchy to create complex interactions among different effects, such as simultaneous twisting and bending. But what makes PixelPutty Solo's Inverse Kinematics feature a true standout is the way it moves the skin covering linked objects, as well as the objects themselves, which makes for very realistic animations. An important animation feature that's missing, however, is an event timeline.

Presenter Professional's animation tools are not integrated with its modeling module, which makes the animation process more awkward and time-consuming than with integrated programs. However, Presenter Pro provides several special tools. By giving objects mass and weight, for example, you can create animations that take into account real-world forces such as gravity. The program's audio capabilities are also noteworthy. You can assign sounds to objects and set up virtual microphones in your scene to record the sound of an object as it moves through the scene. The result is akin to the Doppler effect — the pitch of a sound changes as an object moves toward and then away from the microphone.

Extreme 3D offers not only a well-designed and full-featured timeline but also object tracking for lights as well as objects. That means you can point a light at an object and have it automatically follow the object as the object moves around in the scene. You can also edit motion paths and animate procedural textures.

For top-notch, professional-level animation tools, no program can match the ElectricImage Animation System. The EIAS is a time-based system that uses keyframes. What sets it apart is the ability to animate the deformation of simple objects into complex shapes. Spline-based tools for editing motion paths and velocity graphs provide the ultimate in control.

Advanced motion-blur effects surpass anything else available on the Mac and make moving objects more realistic-looking than those in any other package reviewed here. And no discussion of the EIAS would be complete without mentioning the incredible selection of animatable special effects and the ability to synchronize motion with sound. The EIAS is the only 3-D-animation package that displays soundtracks as waveform images on an EIAS timeline.

Also worth mentioning is the new Vibe feature, which lets you use the system's Randomize, Jolt, and Spring tools to add bumps and vibrations to an animation path or to a color channel in an animation sequence. The extensive controls you have over motion parameters are impressive. Also, the EIAS' Inverse Kinematics feature is exemplary. It features parameters such as viscosity and gravity. You can apply several constraints to an IK chain, an ability that's crucial for advanced character animation, and specify any combination of rotating and sliding joints. Sculpt 3D also offers path-based motion, but because only the camera can be animated, the program is limited to creating flythroughs of 3-D scenes.

THE BOTTOM LINE

So which 3-D package is right for you? If you've never worked in three dimensions before and you don't require the production-level features of the high-end packages, Ray Dream Studio is an excellent value that combines a modeler, renderer, and animator in one package. Helpful wizards and the ability to run on low-end Macs make it even more attractive for first-time buyers. If you're looking for slightly more advanced features, Infini-D and Extreme 3D are both good all-in-one choices. With its directly editable motion paths and unlimited texture layers, Infini-D one-ups Ray Dream Studio. Extreme 3D, with its intuitive interface and the most-powerful modeling tools in its price range, lets you precisely control just about any object characteristic you can think of. Professionals who require the ultimate in quality and precision can't go wrong with the potent combination of form•Z for modeling and the ElectricImage Animation System for rendering, animation, and broadcast-quality special effects.

David Biedny is a bleeding-edge multimedia producer, artist, and educator living in a radiosity-rendered reality. Nathan Moody is a San Francisco-based multimedia artist and illustrator.

DIRECTORY OF 3-D SOFTWARE

Alias Sketch!
Alias/Wavefront
Lindon, UT
800-447-2542
801-431-4045 (fax)
http://www.alias.com/

ElectricImage Animation System
Electric Image
Pasadena, CA
818-577-1627
818-577-2426 (fax)
http://stingray.cac.psu.edu/~eias/

Extreme 3D
Macromedia
San Francisco, CA
800-326-2128
415-252-2000
415-626-0554
http://www.macromedia.com/

form•Z
auto•des•sys
Colombus, OH
614-488-8838
614-488-0848 (fax)
formz@aol.com

Infini-D
Specular International
Amherst, MA
800-433-7732
413-253-3100
413-253-0540 (fax)
http://www.specular.com/

PixelPutty Solo
The Valis Group
Tiburon, CA
800-825-4704
415-435-5404
415-435-9862 (fax)
valisgroup@aol.com

Presenter Professional
Visual Information Development
Monrovia, CA
818-358-3936
818-358-4766
vidisales@aol.com

Ray Dream Studio
Ray Dream
Mountain View, CA
800-846-0111
415-960-0768
415-960-1198 (fax)
http://www.raydream.com/

Sculpt 3D
Byte by Byte
Austin, TX
512-305-0360
512-305-0371
http://bytebybyte.com/

StudioPro Blitz
Strata
St. George, UT
800-787-2823
801-628-5218
801-628-9756 (fax)
http://www.strata3d.com/

Vision 3d
Strata
St. George, UT
800-787-2823
801-628-5218
801-628-9756 (fax)
http://www.strata3d.com/

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You Know The Value Of A Dollar. *SoftWindows 3.0 costs roughly $299. Apple's DOS Compatibility Card, about $749. Plus another ten bucks or so for the screwdriver you'll need to install it.*

You're Loyal. *Sure, you'll be running all those applications from the other side of the tracks. But you'll be doing it on your own terms (i.e., on your Power Mac).*

You're Open-Minded. *Zillions of people use Windows. You're probably even friends with a few. So, it can't be all that bad. (Just in case, we promise not to release your name to the press.)*

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SoftWindows for Power Macintosh

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PHOTO PLAY

POLISH YOUR IMAGES WITHOUT BREAKING YOUR BUDGET.

By Shelley Cryan

Are your cherished photos hidden away in dusty albums?

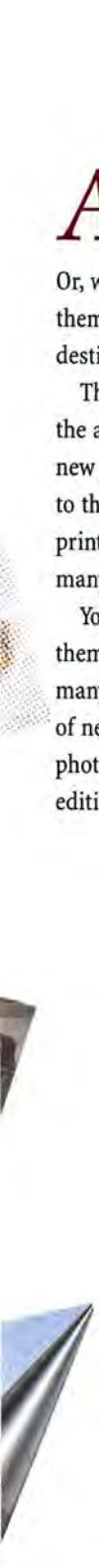
Or, worse, piled up haphazardly in bulging shoe boxes? Well, drag them out, dust them off, and get ready for a round of new products destined to turn your Mac into a low-cost photo shop.

The multibillion-dollar amateur-photography market has caught the attention of the computer industry, triggering an avalanche of new products and services focused on getting shutterbugs addicted to their computers. Using a variety of these products, we scanned, printed, downloaded, and edited our own photos and found that many of the products were affordable, easy to use, and fun.

You can start getting playful with your pictures by first converting them into computer files. You can do this either through one of the many new services that have been popping up recently or by means of new, inexpensive home hardware now on the market. Once your photos have been digitized, you can then use a range of image-editing programs to turn your Mac into a virtual darkroom.

The programs we tested let you perform a variety of alterations, from salvaging underexposed or poorly composed photos to going as far as editing out an ex-spouse whom you might want, so to speak, out of the picture. Edited photos can then be dropped into specialized project software and used for personalizing a variety of everyday objects, including calendars, coffee mugs, and greeting cards.

All this photo fun is open to most Mac users, even those with 68040-based Performas packing 8 MB of RAM. But those who might become frustrated occupy both ends of the spectrum. People with relatively anemic Macs (68030-based or less powerful ones) won't have the horsepower to manipulate photos at anything faster than a snail's pace. Graphics pros, who prize versatility and demand precision in their tools, will likely be underwhelmed by the hobbyist level of the affordable hardware and software we've chosen. If you and your CPU fall somewhere in between, get ready for some photo opps.



Step 1: TURN PICTURES INTO PIXELS

Getting color photos into your computer is cheaper and easier than ever. In the short run, the least expensive route is to have someone digitize your photos for you. You'll pay for each photo but won't have to cough up funds to purchase any input hardware.

However, if you need tight control over turnaround time, you may want to consider digitizing your photos yourself. After the initial outlay for a scanner or a digital camera, the cost per scan is nil.

FULL SERVICE

If you opt to take your pics to a shop for digitizing, you still have several methods to choose from, distinguishable chiefly by resolution (see the "Pixel Perfect" sidebar), price, turnaround time, and delivery medium. Many service providers digitize photos en masse, via an automated process. Some deliver the goods on floppies, others post the images online for downloading, and yet others burn them onto CDs.

FLOPPY PHOTOS. Need a 24-exposure roll digitized? How does four bucks grab you — for the whole roll? A few photofinishing companies now offer digitizing as an option with a regular developing and printing order. When you get your prints and negatives back, sometimes in as few as two days, the envelope also contains a floppy full of photos.

But be prepared to make room on your hard disk to accommodate these large image files. In order to work with the photos on-screen, you must copy the files to your hard disk, decompress them, and convert them to a standard file format, such as TIFF or PICT (see the "Saving Grace" sidebar), using a utility provided for free by the digitizing service.

Photos-on-floppy providers, such as Konica PictureShow, are often as close as the photo drop box at your local drugstore or grocery chain. If you can't find this service locally, check out a company that works via the mail, such as Seattle FilmWorks. You'll get your floppy back, chock-full o' pics, in about a week. When time is of the essence, you can shave off a few days by downloading your pictures from Seattle FilmWorks' Web page (http://www.filmworks.com) at no extra charge. If you're using a 28.8-kbps modem, download time for a 24-exposure roll runs roughly six to eight minutes.

The image quality of floppy-based photos is adequate for many hobbyist-level projects, such as newsletters and personalized calendars. Konica images weigh in at 600 x 400 pixels; those by Seattle FilmWorks have a slightly higher resolution — 640 x 480 pixels.

CYBERSTORAGE. Floppies don't last forever, and given that image files are notorious space hogs, your hard disk tends to fill up fast. One company, PictureWeb (http://www.pictureweb.com), offers a solution: After digitizing your pictures, the company stores them for you on the Web. You and your designated friends can then punch in a private password to browse through your photos at any time. PictureWeb also maintains a limited site on America Online and will likely be offering full services there by the time you read this.

Beware, however: PictureWeb pages, especially those laden with a dozen thumbnails of your images, can take

a minute or two to appear on your screen, even if you're using a 28.8-kbps modem. Click on a thumbnail to see a larger version of a selected image, and then download it if you want that image.

Besting the photos-on-floppy digitizers, PictureWeb offers several choices of format (JPEG, GIF), compression, and resolution (choose custom resolutions of up to 800 x 640 pixels) for downloading. Also, its top resolution choice beats out those provided by Konica PictureShow and Seattle FilmWorks. The download time for an image with the highest resolution and least amount of compression is about two minutes if you're using a 28.8-kbps modem; images with lower resolution and greater compression take less time.

Remember, however, that because PictureWeb stores images for you, you have to download only those you need for a project. The rest, as well as the originals of any images you download, stay safely in PictureWeb's Web space. You pay $24 to store up to 100 images for a year.

PictureWeb charges $28 to develop, print, and digitize a 24-exposure roll, but it plans to drop this price to $12 by the time this article appears, bringing its fees in line with those of budget digitizers. (However, you'll still pay 99¢ to have an individual print, slide, or negative digitized by PictureWeb.) It also plans to team up with mail-order firm Mystic Color Labs to offer online delivery of digitized photos to Mystic's clients.

CD SOLUTION. If you're looking for the Rolls-Royce of mass-digitizing services, you'll find it in Kodak's Photo CD. Although many average storefront photofinishers offer Photo CD service, Photo CD images are of such high resolution that even graphics professionals use them in their work. Additionally, the images are permanently stored on a durable compact disc, sparing your hard disk.

Photo CD discs each hold about 100 photos, each of which appears in five resolutions. Three of the resolutions exceed those of photos-on-floppy digitizers (up to a whopping, RAM-choking 3,072 x 2,048 pixels). The maximum resolution is decidedly overkill for hobbyist projects, but because Photo CD images are equal in quality to those snapped on 35mm film, this storage method is ideal for archiving. Plus, you don't have to archive all your photos at the same time; you can store subsequent photos on partially filled discs at later dates.

Kodak also offers a variety of low- or no-cost utilities that streamline the use of Photo CD images, optimize color accuracy, and help manage image collections across many discs. You can also easily share your Photo CD discs with Microsoft Windows devotees.

Photo CD discs may sound like the perfect storage option, but there's a dark cloud for every silver lining. If you want to keep the processing cost for a 24-exposure roll under $30, expect a two-week turnaround. If you need one-day turnaround, cough up roughly twice that and be sure to go to a photofinisher who processes Photo CD discs on-site. (Processing of an individual print or slide costs between $1.50 and $3.00.) To economize, have your film developed and printed traditionally and then select only your favorite photos to put on-disc.

JUST A CLICK AWAY: PhotoEnhancer, and its beefier sibling, PhotoEnhancer Plus, provide a quick and easy way to fine-tune your images. Here, you'd just look over the color choices that were presented to you and click on the one you liked best.

Do It Yourself

If you get tired of shoveling money to digitized-photo providers, consider digitizing your photos yourself. Low-cost hardware can make it happen — with few hassles.

SCANNERS. Prices of color scanners have dropped, and the scanners have become easier to use. Standard flatbed scanners offer a scanning area with dimensions almost equal to those of legal-sized paper, so you can scan large as well as small photos. The maximum resolution you

Saving Grace / *in a TIFF over file-format choices?*

WHEN SAVING IMAGES TO DISK, you need to decide on a file format. Sometimes you may not have a choice — the program in which you plan to use your images may accept only a certain format — but usually you've got some latitude. Also, some formats offer compression options, which make it easier to fit images on floppies and conserve hard-disk space. Here are some common formats and compression schemes:

EPS

(Encapsulated PostScript)

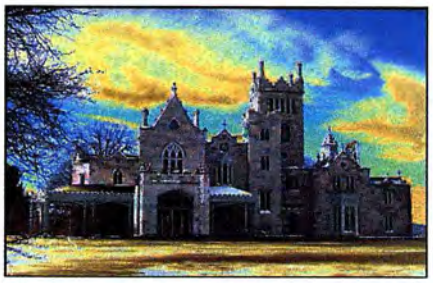
EPS is the only format that supports the use of clipping paths, which allow you to create irregularly shaped images, as opposed to only rectangular and square ones. However, stick with the TIFF or PICT formats if your final output will be to a non-PostScript printer.

GIF

(Graphic Interchange Format)

If you plan to post your images online, GIF is a smart bet, because its relatively small file size allows images to transmit quickly over the Internet. This format is a poor choice for most other uses, however; because GIF files are limited to 256 colors, details and color quality suffer.

A



B

C

PRESTO CHANGO: Your friends may think you slaved all day stylizing your image, but you know that it took only one or two mouse clicks in your image-editing program. Just pick your favorite special-effects filter, and watch as your image goes from ho-hum (A) to artsy (B). Many image-editing programs also accept third-party add-on filters, such as those provided in KPT Cool Effects, from MetaTools (C).

get from most flatbed scanners is greater than what you can get from budget scanning services, and the price is right. Scanners targeted at home users — including offerings from La Cie, Hewlett-Packard, Apple, Epson, Microtek, and UMAX — start at about $400. In general, you pay more for scanners that offer higher resolution and sophisticated color-capture features.

Storm Software's EasyPhoto Reader offers an innovative twist on scanner technology. At about half the size of a shoe box, this diminutive gizmo is built to scan prints of up to 4 inches in width. Period. Unlike its flatbed brethren, the EasyPhoto Reader can't scan thick items such as books. Nor does it include sophisticated software for adjusting color values and image resolution before you scan. And you can forget about any optical-character-recognition capabilities.

Instead, the EasyPhoto Reader trades versatility for unparalleled ease of use and an attractive $269 price. It connects via a serial port, so it's not part of a potentially fragile SCSI chain. Scanning is a one-touch operation: Stick your photo onto the tray, and press a button. The Reader grabs it, scans it, and spits it out. It requires no technical expertise on your part. Best of all, scans match the original image quite closely and the maximum image resolution, 200 dpi, tops that of digital cameras and budget digitizers.

DIGITAL CAMERAS. Need the shortest-possible turnaround time? Bypass film entirely by capturing images digitally.

JPEG

(Joint Photographic Experts Group)

Because of its very small file sizes, the JPEG format is another good choice for images transferred via modem or for those crammed onto a floppy disk. JPEG is actually a compression scheme that throws away data to save space — called a "lossy" scheme — so you'll notice image degradation if you opt for a high level of compression. At lower levels of compression, however, picture quality remains accurate.

PICT

(not an acronym)

Files in this very common bitmapped format are often used for on-screen presentations, because of their relatively small size. Avoid using PICT as a file format if you need to color-separate your output or if the image contains PostScript text or graphics — with PICT, what you see on-screen is not always what you get on paper.

TIFF

(Tagged Image File Format)

Images in this format are high-resolution and bitmapped. As a rule of thumb, TIFF files work well for the printing and on-screen display of photographic images. You can reduce the size of TIFF files by using the LZW (Lempel-Ziv-Welch) compression scheme, which some programs may offer as an option. Unlike other types of compression, LZW maintains image quality through a so-called "lossless" scheme, which compresses images without throwing away any data.

If your Mac has a video-in port, either built-in (as on the Power Mac 7500) or supplied via an add-in card, you can plug your family camcorder or VCR into your Mac and grab images from favorite videotapes. Or fork out $99 for Connectix's QuickCam, a grayscale, no-frills digital-video camera that plugs into a standard serial port.

A more versatile solution, however, is to use one of the hot $1,000-and-under color digital cameras. They offer autofocus and autoexposure, so they operate like traditional point-and-shoot cameras. Digital cameras' claim to fame: They have no film.

Instead, images are stored in the camera's built-in memory and can be transferred to your computer via a cable that connects the camera to your computer's modem or printer port. You can go from releasing the shutter to viewing your photos on-screen in literally minutes. Digital cameras generally offer you the same photo capabilities as low-cost point-and-shoot cameras, but film captures greater image detail, enabling you to pull off artistic close-up shots.

The low-end-digital-camera field is crowded these days, with entries from companies such as Casio, Apple, Chinon, and Kodak. Epson is working on one that's due out at about the time this article appears. In our informal tests, the Casio images, which have relatively low resolution, appeared grainier than most. Despite its hefty price tag of $979 (estimated street), we especially liked Kodak's new DC50 Zoom model, which comes with a zoom lens and offers expandable storage via PC Cards (see review, May '96, page 44).

Step 2: Photo Finishing

Once your photos are digitized, the ugly truth may come out: Your pictures aren't perfect. Not everyone is an Ansel Adams or an Annie Leibowitz. Your pictures may be under- or overexposed, suffer from poor composition, or be plagued by the red-eye menace. Or heck, the photos may look fine artistically but you'd rather have Tyra Banks' or Jackie Chan's body instead of your own.

Fortunately, image-editing software gives you the means to enhance your digitized photos. Programs aimed at hobbyists sport low sticker prices as well as friendly interfaces.

You'll probably start using the programs for cosmetic touch-ups and simple formatting, such as rotating an

PHOTO FUN

4 photo projects in under an hour apiece

YOU'VE DIGITIZED your favorite photos, rubbed out the red-eye, and fooled around with a slew of special effects. But where do you go from there? If you're short on creative ideas for outputting your artwork, take a look at the following four projects to get ideas for personalizing flyers, calendars, coffee cups, and postcards — each in under an hour.

Project: Real-Estate Flyer

Tools: **Image-editing software, Adobe PhotoDeluxe**

STEP 1: Digitize a photo of a property, using one of the many options mentioned in the main article. Then convert the image to a TIFF file. (Shown here is the image we used.)

Pixel Perfect / *focus in on resolution*

BE YOU AMATEUR OR PROFESSIONAL, if you're going to be working with photos on your computer, you should understand the costs and effects of resolution. Images with high resolution show off sharp details but also take up more space on your hard disk than low-resolution, less visually exact images. They also usually cost more to digitize. In order to save yourself some time, money, and hard-disk space, you should figure out the resolution you really need for your project.

But before you can do this, you'll probably want to understand the ways of measuring resolution. When you're using digitizing services or digital cameras, you'll find resolution expressed in terms of pixel dimensions, which measure the long and short sides of a rectangular image. Seattle FilmWorks' digitizing service and the Apple QuickTake 150 camera, for example, both provide images at a 640-x-480-pixel resolution.

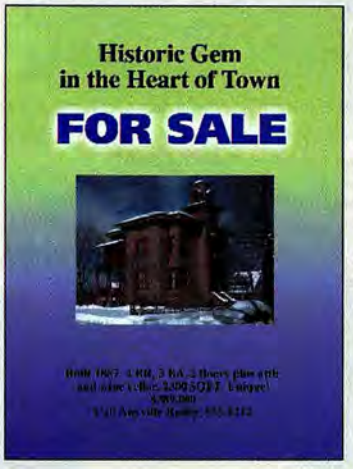
If you're working with scanners, on the other hand, you'll usually hear about resolution in terms of dots per inch, or dpi. Storm Software's EasyPhoto Reader, for example, maxes out at 200 dpi, which is considered on the low end of today's scanner capabilities.

To compare dpi with pixel dimensions, multiply your photo's original measurements by the photo's scanning resolution to get the total number of pixels for each dimension. A 4-x-6-inch print scanned at 200 dpi would measure 800 x 1,200 pixels. Work backward to figure out dpi from pixel dimensions. Crank through the mathematics, and you'll quickly see that even the lowest-resolution desktop scanners can provide higher-resolution images than most value-priced digitizing services or digital cameras — as long as your scanned print is at least 4 x 6 inches.

But will your digitizer of choice provide the resolution you need? More to the point, what resolution *do* you need? Pick one that's too low, and you'll get jagged, coarse images. Pick one that's too high, and your Mac may not have enough RAM to handle it. Even if it does, an image with a higher resolution than you need will cause your computer and printer to grind away needlessly, and you'll waste hard-disk space storing mammoth files. A 640-x-480-pixel color image takes up just under 1 MB, for example, and a 1,200-x-1,800-pixel color image occupies more than 6 MB.

The resolution you need depends on your final output. If you are a

STEP 2: Open your file in an image-editing application such as PhotoEnhancer Plus, in which you can crop and touch up your image. We used the clone tool to paint over the antenna on the roof and also to remove the traffic sign that blocked part of the house's front door.



STEP 3: Open your image in PhotoDeluxe, and select the Flyer icon, which brings up step-by-step instructions for creating flyers. Early on, you should choose a template and establish placeholders over which you can add the photo and descriptive text. In our example, the For Sale headline was already in place and colored, as was the background gradient. The flyer is now ready for output on a color inkjet printer.

image. If that's all you want to do, you might be content with the free file-conversion utilities that are provided by Konica PictureShow and Seattle FilmWorks and that offer very rudimentary image-editing features.

Digital cameras usually come with more-substantial software. Apple PhotoFlash, which is bundled with Apple's QuickTake 150 camera, has particularly easy-to-use controls for straightening images, cropping, and removing scratches and dust. Kodak cameras include PictureWork's PhotoEnhancer; a beefier version is available as PhotoEnhancer Plus. Both versions win the ease-of-use prize when it comes to adjusting colors, contrast/brightness, focus, and exposure. Pull up the Filter By Example dialog box to adjust, for example, the yellow-to-blue range of color values. PhotoEnhancer (as well as PhotoEnhancer Plus) then displays a section of your image repeated nine times, with varying levels of color, ranging from mostly yellow to a dominant blue cast. Double-click on the image you like the best, and the adjustment is complete.

Many of the budget image editors, including PhotoEnhancer Plus, let you make more-drastic changes. Others in this category are Microfrontier's ColorIt!; Microspot's PhotoFix; and MacSoft's PhotoMaker, which is actually a limited version of ColorIt!. All sport a large image-editing area with a menu up top and a floating toolbox.

Another program, Adobe PhotoDeluxe, offers many of the features and tools common to image-editing programs, but its approach redefines simplicity. Instead of having an image area flanked by a tool bar and menu bar, PhotoDeluxe arranges file-folder-like tabs across the top of the screen. Click on the tabs to uncover step-by-step instructions for adjusting image brightness, color balance, and more. There's also guidance for slightly-more-involved alterations, such as replacing the background of one photo with that of another, putting your head on the body of someone or something else, removing red-eye, and applying special-effects filters.

A variety of handy tools populates the average image-editing program's toolbox. Use the pencil tool to draw arrows pointing to a particular location in a photo (the grassy knoll?) or to add an inscription in your very own handwriting. Spray-paint over a busy background, or whip out the paintbrush to see what your house would look like in a different color.

hobbyist, final output is most likely on either your screen or a color inkjet printer. If you plan to output to screen, you'll need to scan your image at your monitor's resolution. You can find out your monitor's pixel resolution by clicking on the Options button in the Monitors control panel.

However, if you plan to print to a desktop color inkjet printer, you'll probably need a higher resolution. Say you've got a 360-dpi color inkjet printer and you want to use it to print a photographic image. Scan the photograph at 360 dpi, right? Wrong. That'd be too easy.

The bad news is that printer resolutions aren't equal to scanning resolutions. The good news is that it's easy to figure out what you need. Here's a handy tip: To figure out the scanning resolution needed, divide the printer's resolution by 3. You'll see that your 360-dpi color inkjet printer can make use of the information in a 120-dpi scanned image. (FYI, according to our handy math, a 4-x-6-inch image scanned at 120 dpi will have a resolution of 480 x 720 pixels.) There's some leeway, so experiment a bit to find the resolution that looks best to your eye. You may find you can get away with a somewhat lower-resolution image, but increasing the resolution drastically isn't going to improve the image quality.

The bottom line? If you're outputting to screen or to a low-end inkjet printer, a budget scan or a low-end digital camera will provide ample resolution — much of the time. But there's a catch. The math works only if you're using your images at their original size or smaller. If you plan to enlarge your images, you'll benefit from the higher resolution attainable from scanners, service bureaus, and Photo CD.

Say you've got a budget scan of a group shot taken from afar and you want to isolate and enlarge one of the faces to decorate the front of a card. When you blow up the face, however, the image becomes jagged and blurry. Why? Because the pixels that comprise the face are now spread over a larger area, effectively reducing the dots per inch (think of how images printed on a balloon get grainier as you blow up the balloon).

In effect, you need to start out with a higher resolution to end up at your target resolution for the final, enlarged image. This is when you'll need to seek out higher-resolution options, because images from low-end digital cameras and photos-on-floppy providers will fail you.

It's the specialized image-editing tools, however, that can be the most fun to use. Clone tools, for example, help you cover unwanted parts of an image, such as ugly telephone wires, by letting you "paint" with colors and patterns you pick up from other areas of the image. Another convenient tool, the magic wand, enables you to select a contiguous patch of color with a single mouse click. This sure beats painstakingly outlining a section of sky you want to brighten or tracing around a head of hair you want to recolor.

Once you've mastered some of the more specialized tools, you can play with some creative cutting and pasting. Drop sections of one image into another image, creating scenes that never existed in real life. Seat yourself next to Brad Pitt, share a joke with President Clinton, or circle the globe in the space shuttle — all on your Macintosh screen.

All the programs we used also offer funky special-effects filters. Some filters let you trace the edges of an image in black, making a sort of coloring-book version of the image. Another filter creates an embossed look. Just select a filter from a menu when your photo is open, and the program will apply the change. If your software doesn't come with the filter you're looking for, try using a set of third-party plug-ins, such as KPT Cool Effects, by MetaTools. Plug-ins, most of which are collections of filters designed to work with Photoshop, can be used with nearly all the image-editing programs mentioned in this article, excluding both versions of PhotoEnhancer.

Step 3: Make Arts into Crafts

Edited digital photographs are the raw material for a host of fun projects. Drop them into a word processor, such as Microsoft Word, or a page-layout program, such as Adobe PageMaker, to create eye-catching For Sale signs, missing-dog posters, real-estate flyers, or family newsletters.

PAINLESS PROJECTS. Don't have the time or skill to design layouts? Check out specialized software. One of the image editors — Adobe PhotoDeluxe — doubles as a project generator. PhotoDeluxe not only guides you through enhancing an image but also provides tab-based step-by-step instructions for completing projects with photos. Projects include colorful calendars, greeting cards, funny money, flyers, signs, and fake magazine covers.

Brøderbund's PrintShop Deluxe CD Ensemble offers templates for creating posters, banners, greeting cards, business cards, and postcards, all of which can be made more personal when illustrated with photographs. Compared to PhotoDeluxe, PrintShop offers fewer projects that are specifically designed to incorporate photographs, but you can customize the terrific collection of templates and enhance them with PrintShop's ample supply of clip art.

If none of these programs has that esoteric greeting-card layout you need, you might find it in Mindscape's

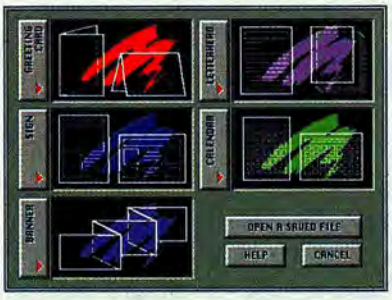
PHOTO FUN

Project: Calendar

Tools: **The PrintShop Deluxe CD Ensemble, image-editing software (optional)**

STEP 1: If necessary, touch up your photo with an image-editing program. You might want to crop it, replace the background, or remove unwanted items.

STEP 2: After launching PrintShop Deluxe, you'll see a handful of project options. Select Calendar. Succeeding screens will ask you to specify your calendar's dates and either a wide or tall orientation.



STEP 3: Next, you're asked to select from among dozens of backgrounds and then from a handful of layouts. Make sure you pick a layout that leaves enough room for a photo — not all of them do.

STEP 4: PrintShop Deluxe creates the calendar to your specifications. After the calendar appears on-screen, select File Import to pull in your favorite photo (PICT or EPS format only). Position and/or resize the photo. If you like, add text and graphics to highlight important dates. Then you're ready to print!

Project: Photo Mug

Tools: **Image-editing software, Fargo FotoFun! printer, Fargo Mug Kit**

STEP 1: Use an image-editing application such as ColorIt! to touch up your original photo. In our example (left), we cropped and resized the image to fit on a mug. We then used the clone tool to paint over dust spots and to create a more festive effect by replacing the ugly lamp in the background with Christmas-tree branches. We also fixed the children's red-eye problem by selecting the red pupils with the magic-wand tool and then pouring in black paint with the paint-bucket tool. Finally, we used the text tool to write *1995* (right).

STEP 2: Print your image on the Fargo FotoFun! dye-sub printer, using the printer settings recommended for coffee-mug transfers.

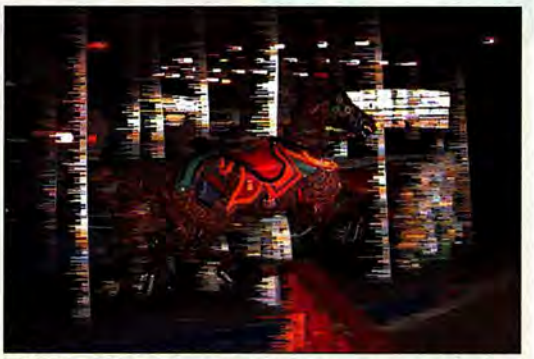
STEP 3: Secure your printout to a supplied coffee mug, using tape and the special clamp. Bake the mug in an oven for 15 minutes, and cool it in warm water for 2 minutes. Then remove the clamp, tape, and print, and your mug will be ready for a hot cup of coffee.

Project: Postcard

Tools: **Adobe PhotoDeluxe, Fargo FotoFun! printer, Fargo Postcard Kit**

STEP 1: Our original photograph of the carousel horse was unimpressive, especially with the red fence marring the composition. We saved an extra copy of the image.

STEP 2: We selected PhotoDeluxe's Motion filter to distort the image and to add the illusion of motion to the horse.



STEP 3: We returned to the copy of the original photo and clicked on the Change Background icon. PhotoDeluxe then stepped us through the isolation of the horse that we wanted to keep and its placement in the photo we had distorted with the motion filter.

STEP 4: We selected the Brightness icon and lightened the darker parts of the horse — the neck, legs, and tail — to make them easier to see. We then clicked on the Text icon to add text and a drop shadow for the text (see below).

STEP 5: We printed the file on the Fargo FotoFun! dye-sub printer, using paper supplied in Fargo's postcard kit. The final product was a glossy, photograph-quality postcard suitable for mailing.

CardShop Plus, which offers card layouts, clip art, and suggested text appropriate for birthday, St. Patrick's Day, and get-well cards and a host of others. The interface is a bit confusing, however, making the program harder than necessary to master.

If you're not keen on making customized cards and calendars but would just like to get all those old photos out of their overloaded shoe boxes, you can use ProView's E-magine to create a digital photo album. This simple program lets you fill album pages with photos as well as with sounds and movies. You can view the pages in sequence, as a kind of slide show, or click on "hot areas" that you can set and that let you jump to preselected pages. The beauty of this program is how easy it is to use — you can create an album in minutes.

IMAGE PRODUCERS. For projects that require color output, check out the under-$500 inkjet printers, including those from Apple, Epson, and Hewlett-Packard. If you want higher-quality or larger-sized output than what desktop printers can produce, consider bringing your files to a service bureau (check in the Yellow Pages under *Desktop Publishing*). For photographic-quality prints, ask for output on a dye-sublimation printer, which offers a richly colored, lustrous finish similar to that of a glossy photograph.

The dye-sub printers at service bureaus can output images with dimensions as large as 12 x 18 inches, but if you want photographic-quality prints you can store in your wallet, take a look at Fargo Electronics' FotoFun! dye-sub printer. Ideal for home users, this shoe-box-sized $499 printer is so easy to install and use that in less than ten minutes, you'll be printing your kid's best baby pictures to send to grandma. Maximum output size is 4 x 6 inches, and you have to use special paper and dye ribbons available through Fargo.

For about $40 more, you can buy companion kits from Fargo that let you print onto label or postcard media (36 prints apiece). An additional kit, also for $40, includes materials that let you transfer photos to four coffee mugs — it's as easy as printing an image, securing it to a supplied mug, and then baking the mug for 15 minutes. The results are impressive; the image is permanently fused to the mug, appearing as clear, sharp, and colorful as the original print.

The Big Picture

Using photos — your own photos — in everyday projects is easier than ever and is no longer the exclusive purview of graphics professionals. New services and products offer myriad ways to digitize and manipulate images, at prices well within the reach of most hobbyists. And there's certainly no shortage of ways to use the images. So go ahead and, er, develop your photographic talents. There are no negatives: It's a snap.

Shelley Cryan is a *MacUser* contributing writer with a photographic memory. Unfortunately, it doesn't always develop.

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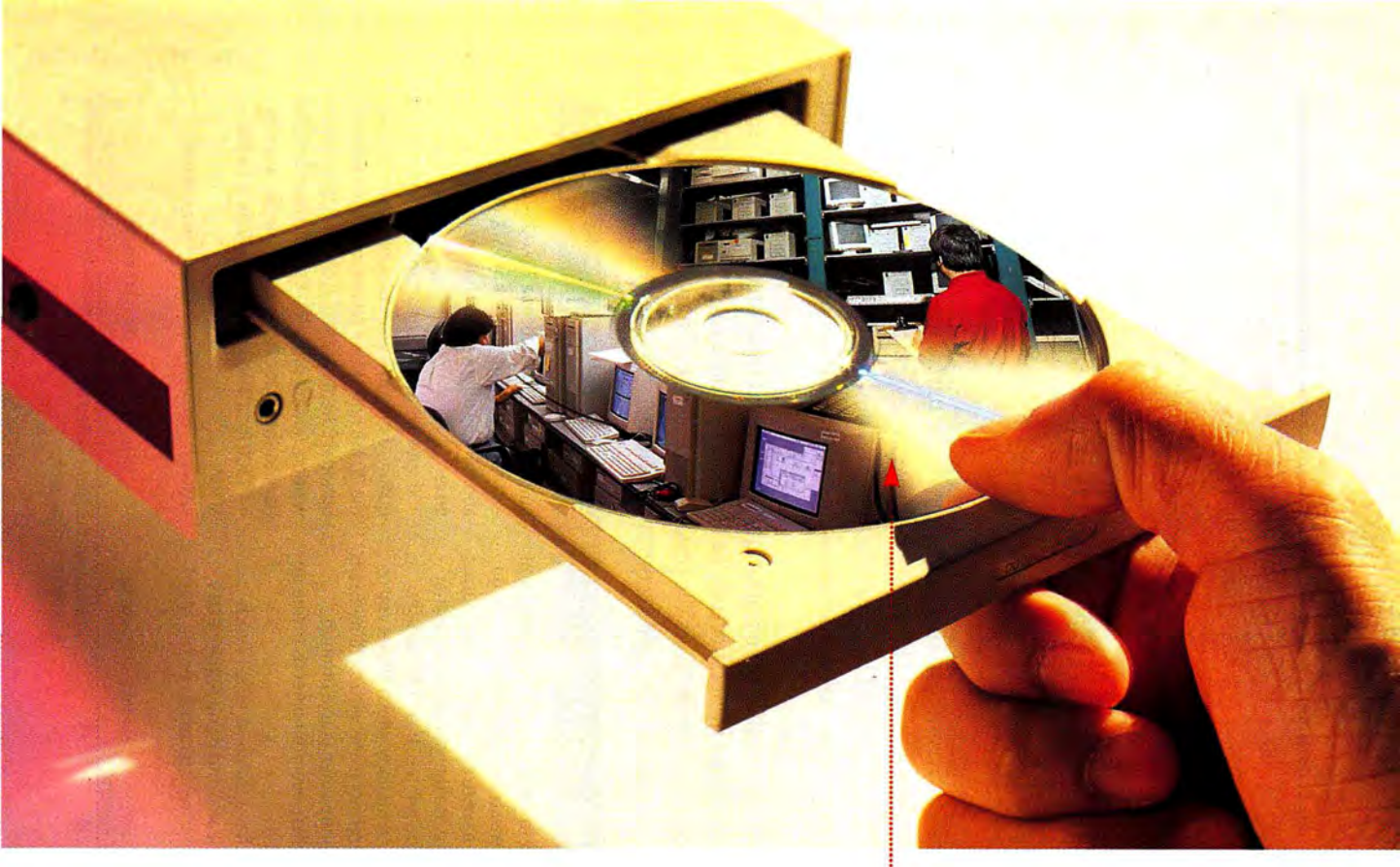

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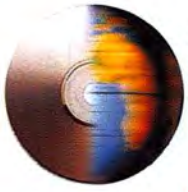

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QUICK LABS

Xanté's Latest Imagesetting Alternative • Two New Gig Drives • NEC's Newest Monitor Values

WHEN YOU WANT TO BUY A PRINTER, you don't just buy *any* printer. First you consider your particular needs and applications, and then you peruse what's available. If you were a college student, for example, you wouldn't buy a superfast workgroup printer for your dorm room (unless you planned to connect the *whole* dorm to the printer). And you wouldn't buy an inkjet printer for an office network of more than 20 people.

Even within specific user categories, there are niches. For instance, the new Xanté printer in this month's roundup is fully capable of supporting a business workgroup but it's really aimed at desktop publishers.

And even though some products are tailored for a particular niche, their talents can be extended beyond it. The MicroNet drive we review this month makes fast work of the large files used by graphic artists and desktop publishers. It also has a high capacity and a flexible docking system, which makes it attractive to other types of users as well.

Why is the target audience so important when we evaluate products? Because it helps us keep things in perspective. To properly evaluate each product, our test data has to be tuned to the tasks the product was designed to perform. That way, we know we're making the right recommendations.

ONE NEW LASER PRINTER

High-resolution, tabloid-bleed printers are hot these days. We've tested a few here in Quick Labs, and this month, we feature yet another — the Xanté Accel-a-Writer 8300 ($5,495). The monochrome printer, which the vendor rates at 8 ppm, uses a Canon JX engine that produces imagesetter-type quality for newsletters, advertisements, CAD drawings, and plain-paper separations.

And judging from the files we printed, the 8300 is quite capable of producing stunning output for press purposes. Our grayscale photos and art printed with excellent detail and clarity. But remember, to get good-looking output, you need to compensate for dot gain when you go to press. You'll have to either adjust your output in Photoshop or use the gamma settings that are built into the printer. The 8300 also uses Xanté's X•ACT technology, which allows you to calibrate the horizontal and vertical dimensions — a handy feature when you're printing separations, where everything needs to line up correctly.

The printer has a standard 11-x-17-inch maximum print area, but if you require extra room for trim and register marks on full-bleed output, you can opt for the 12-x-25-inch extrawide-print option, for $495. Xanté additionally offers a $450 internal SCSI disk drive.

If speed is just as important to you as output quality, then you'll want to purchase more than the 20 MB of RAM we tested with. Even with the optional Ethernet card ($395), the 8300 kept us waiting. Adding more RAM should help, but you have to shell out extra cash for the extra speed — $300 for a 4-MB SIMM, $1,200 for a 16-MB SIMM.

REVIEWER / ROMAN LOYOLA TESTER / JIM GALBRAITH

+ / OUTSTANDING • / ACCEPTABLE – / POOR	ESTIMATED STREET PRICE	COLOR OR MONOCHROME	TECHNOLOGY	RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS	PAGES PER MINUTE
Xanté Accel-a-Writer 8300	$5,890*	monochrome	laser	1,200 dpi	1 year	+	+	•	•	Great output, but speed suffers at base RAM configuration.	FASTER → 0 1 2

*Price includes Ethernet card, which was used in our testing.

PHOTOGRAPHY / JACKSON VEREEN

TWO NEW HARD DRIVES

Hard drives are made with a specific user in mind — they're either tailor-made for working on large files or built for less-strenuous work such as word processing. Take, for instance, a 1-GB hard drive: It can be either the largest of the smaller, low-end drives or the smallest of the faster, high-end drives. This month, we have one of each, and there are noticeable differences in both speed and price.

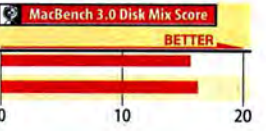
The MicroNet HD 1000 (pictured), a good drive for graphics and DTP applications, uses a portable dock, but it also fits into MicroNet's standard Docking Station base (see Quick Labs, January '96, page 106). The small, durable case features a good fan and hot-swappability. The one drawback of the dock is that it must be the last device on the SCSI chain, because its single SCSI port is internally terminated — a limitation that may make it less attractive for users who don't already have a MicroNet drive. The MicroNet drive performed well on our application benchmark tests and our higher-throughput tests.

The APS Q 1280 is optimized for office applications, such as word-processing and spreadsheet programs. It comes in a compact case with active termination. APS has also revised PowerTools, its bundled software package. The software can now format any SCSI disk, not just one purchased from APS, and it also supports all SCSI cards.

All MacBench 3.0 Disk Mix scores are relative to that of a 1-GB Quantum internal hard drive in a Power Mac 7500/100, which has a score of 10.

REVIEWER AND TESTER / KRISTINA DE NIKE

+ / OUTSTANDING ● / ACCEPTABLE − / POOR	ESTIMATED STREET PRICE	WIDE SCSI	FORMATTED CAPACITY	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/ MANUALS	SUPPORT	COMMENTS
★★★★ **APS** Q 1280	$399	no	1,222.0 MB	$.33	3 years	+	+	+	Yet another quality hard drive from APS.
★★★½ **MicroNet** HD 1000	$635	no	1,036.2 MB	$.61	3 years	●	●	+	Portable. Part of MicroNet's DataDock line.



FIVE NEW MONITORS

This month in Quick Labs, we highlight two monitors from NEC, the MultiSync XV15+ (pictured) and the MultiSync XV17+. Both monitors have easy-to-use on-screen controls that include advanced geometry settings rarely found even on high-end monitors. Photographic images looked somewhat grainy at standard Mac resolutions, but either monitor is a good choice for general home or office use.

For users who don't need as much color control but still want sharp, bright, uniform image quality, the Sony Multiscan 17se II is a good choice. Its larger sibling, the Multiscan 20sf II, scored well in our image-quality tests, but our jury thought the images lacked sharpness. Another drawback of the Multiscan 20sf II: You can't switch resolutions on the fly.

If you're looking for a quality 17-inch monitor that's more affordable than the Sony Multiscan 17se II, check out the ViewSonic PT770. The on-screen controls are easy to adjust, with a single knob-and-button combination, and it has a handy autoadjust button for quickly changing the geometry to suit new resolutions. But you have to save new settings manually, or they will be lost when you turn the monitor off.

The image-quality scores reflect the results of our tests for image sharpness, focus, brightness, uniformity, pincushioning, color range, color accuracy, and vibrancy. Maintaining focus and sharpness is more difficult on larger monitors, so 20-inch monitors tend to score lower than smaller ones. A score of 1.0 is considered acceptable.

REVIEWER AND TESTER / BRIAN FIKES

+ / OUTSTANDING ● / ACCEPTABLE − / POOR	ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS
★★★★ **NEC** MultiSync XV15+	$499	15 in.	1,024 x 768 pixels	3 years	+	+	+	A good choice if you're buying your first Mac.
★★★★ **NEC** MultiSync XV17+	$849	17 in.	1,024 x 768 pixels	3 years	+	+	+	Excellent on-screen controls.
★★★½ **Sony** Multiscan 17se II	$1,399	17 in.	1,280 x 1,024 pixels	2 years	+	+	●	Image quality needs very little tweaking. Pricey.
★★★½ **Sony** Multiscan 20sf II	$2,299	20 in.	1,280 x 1,024 pixels	2 years	+	+	●	A DTP monitor, but has limitations.
★★★½ **ViewSonic** PT770	$999	17 in.	1,600 x 1,200 pixels	3 years	+	●	+	Easy-to-use on-screen knob-and-button control panel.

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

GET INFO / **APS Technologies** 816-483-6100 **MicroNet Technology** 714-453-6100 **NEC Technologies** 508-264-8000 **Sony Electronics** 408-432-0190 **ViewSonic** 909-869-7976 **Xanté** 334-476-8189

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The ScanMaker E3 also includes OCR and image-editing software for Windows or Macintosh.

Also Introducing A 30-bit High Resolution, Single-Pass Color Flatbed For Only $599!
Need higher resolution? Ask for Microtek's *ScanMaker® E6* which *starts at just $599!* With its 30-bit depth and 4800 dpi maximum resolution the ScanMaker E6 renders images with increased detail in highlight and shadow areas. The ScanMaker E6 includes ScanWizard, OCR and image-editing software for Windows or Macintosh. And both the ScanMaker E3 and E6 work with Windows 95.

"◆◆◆◆"
MacWEEK (August 7, 1995)

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When you're shopping for fonts, it pays to look beneath the surface. Here's how to buy a boffo Bodoni.

By Kathleen Tinkel

Fonts 'R' Us

FONTS SEEM SIMPLE compared to other kinds of software. A whole family of typefaces can fit on one floppy disk, and once a font is available to your system, it sits there unobtrusively, waiting to be called into service. Viewed that way, a font *is* simple. But as so often in real life, buying fonts isn't simple at all.

Face Value

Before you can buy a font, you need to make several choices, either deliberately or incidentally. The first is the choice of the *typeface* — the design — as distinct from the *font*, which, in the case of Mac-software terminology, is a specific product based on the type design. You'll have more control over quality if you begin by selecting the typeface and then try to locate a font that most closely replicates that design. Many fonts don't exactly live up to their typographic namesakes.

Almost everyone needs text as well as display typefaces. Good text faces, used for running copy, are legible and easy to read, offering no distraction or impediment to the reader — *transparent*, to use the typographer's term. You can use text faces at any size, but 9- to 13-point, the size range for which text faces are usually designed, works best. Purchasing text families should be considered an investment; like good suits, they can be mainstays of your type wardrobe for many years. A text family may include dozens of styles (bold, italic, and possibly many others), so it can be expensive. But you should be able to set any kind of text with no more than half a dozen text families, and you can acquire them one at a time.

In contrast to text faces, display faces are meant to be seen. Some resemble the text faces they're designed to complement; others may be ornamental or wild and crazy. Display types are meant to be used at larger sizes — certainly no smaller than 14-point. Using them at standard text sizes may result in illegible characters and cramped spacing. Compared to text fonts, display fonts — many of which have reduced character sets (often only capital letters) — are easier to produce, and there are hundreds of new ones every year.

Picking the Right Font

There can be several fonts for any type design — in fact, some popular faces may be available in a dozen different packages that vary only in details. Depending on what your design intention is, some of those details may steer you toward one font rather than another.

Fonts vary in visual quality, both overall and in terms of particular functions — some look better at low resolution, for example; others may be superb typographically but hard to read on-screen. Some fonts are simply badly made, with technical defects that can cause output problems, particularly if you are sending files to older imagesetters.

Few perfect fonts exist, but you can usually find one that suits the work you need to do. Here are some factors to consider:

Character Set. Type designs typically include 400 characters or more, but because a font made for desktop systems can have no more than 256 characters, font manufacturers are forced to eliminate some characters. Many fonts exclude such niceties as old-style figures, true-cut small caps, and ligatures. Most do not include alternate characters (such as those in Avant Garde and the swashes in Bookman and Caslon). And standard fonts rarely include ornaments that are sometimes part of the original type design. Sometimes you can buy supplemental Expert, Alternate, or Ornament fonts, however, and their availability may be a factor in your buying decisions.

The Font Name Game. Font packages bearing labels of different vendors may in fact contain

ILLUSTRATION / ROBERT DIERCKSMEIER

identical fonts — Adobe, Agfa, Linotype-Hell, and Monotype license type designs from one another and resell each other's fonts. As a rule, Adobe reworks fonts to make them conform to its in-house standards. The other foundries may sell their own versions as well as the Adobe fonts, which can get confusing. If you need imagesetter compatibility, you may have to buy the Adobe font no matter which vendor you buy from. Always confirm that the output service has the font identical to the one you've used, before sending files for output.

The Typeface Name Game. Don't judge a font by its name: Many typefaces that share a family name are not actually the same. For example, there are at least two dozen type families with Garamond in their name available in PostScript format for the Mac today. But some of these — including the popular ITC Garamond — aren't even based on Claude Garamond's original designs. Meanwhile, there are true Garamond-based designs, including Sabon, that bear a different name. For this reason, select typefaces from specimen books by specific name — for example, Stempel Garamond or Bauer Bodoni — and then choose a good font for that design.

Quality. Like other manufactured products, fonts can exhibit certain flaws. Some are carelessly drawn, as evidenced by characters that lack the type design's distinguishing elements — inaccurate line weights, poorly drawn serifs, or oversimplified features (a crossbar that was designed to curve slightly is rendered as a straight line, for example). Autotraced (or ineptly drawn) characters may have too many control points (mathematical data points that tell the computer how to draw each letter). Badly made fonts may display visual defects (such as rippled edges) at large sizes, or they could conceivably overload the RIP in files destined for imagesetter output, although such problems have decreased recently as font-creation software and PostScript RIPs have improved. Bad spacing is another common symptom of poor quality often found in unauthorized copies — fonts that are sold as being "similar to" a well-known typeface.

When you're shopping, look carefully at provided type specimens for evidence of flaws. It's also a good idea to find out if the vendor you're buying from offers a money-back guarantee if the product is faulty.

Where to Buy Fonts

Once upon a time, you could buy fonts at your local computer shop or by phone (for overnight delivery) from mail-order discounters. But those days are gone. These days, font buying is strictly a high-tech proposition.

Encrypted CD-ROMs. For virtually instant gratification and the lowest regular prices, buy fonts from CD-ROMs by ordering unlocking codes by fax (see "Dialing for Dingbats, June '95, page 95). All the larger and some smaller manufacturers sell their fonts this way. (In fact, Adobe sells some of its font library *only* from its Type On Call CD-ROM.) Since Agfa, Linotype-Hell, and Monotype each offer the

Just My Type

MOST OF THE POPULAR TEXT FACES in use today — including the many inspired by or named after such printing pioneers as John Baskerville, Giambattista Bodoni, William Caslon, and Claude Garamond — have their roots in early typefaces created in the first couple of centuries after Gutenberg. We still use these basic type designs, which arose as printing developed. Most of these designs have evolved considerably over the centuries, as they've been reinterpreted for different eras and typesetting technologies. Choosing can be difficult — just as thousands of people claim to have descended from the 200 people who came to America on the *Mayflower*, the few early type designs have tens of thousands of descendants.

Your text-type library probably includes the usual suspects — Bodoni, Garamond — but you may have overlooked these solid citizens. Here are a few of my recommendations for text type, plus a few display fonts that have caught my eye recently.

DISPLAY FONTS

Airstream
ITC

POPTICS THREE
Patricia Lillie

CHROMOSOME
Brian Willson

Ruzicka Freehand
Linotype

EQUAL DECORATED
Adobe

Sloop Script
Font Bureau

EAGLEFEATHER SMALL CAPS
Agfa

STEALTH
FontShop

FETISH NO. 338
Hoefler

Stick Letter
David Rakowski

VAN DER LECK ARCHITYPE
The Foundry/FontHaus

HOTEL MODERNE
Treacyfaces/Headliners

Oz Handicraft
Bitstream

Zeitgeist
Monotype

Adobe library as well as their own, it's a good idea to have more than one CD-ROM package and to shop around a little before ordering. The CD-ROMs are inexpensive or free (Adobe bundles Type On Call with all of its major software, for example); when you buy a CD-ROM, you usually get to unlock some fonts for free or receive a discount toward your first purchase. Adobe's unlocking service is available 24 hours a day, seven days a week, and some of the other vendors are considering extending their hours to match.

Specialty Font Retailers. A small industry in selling fonts from many makers has developed. The largest sources are FontHaus, FontShop, and Precision Type. Besides taking orders over the phone or by fax, these firms can usually identify by fax any typefaces you've found. Most of these places sell many competitive brands, so make sure you're ordering exactly the font you need. Since identical fonts may be packaged under different labels, inquire directly about any price advantages that may be available. Many of these companies are font manufacturers as well as resellers, and most have catalogs or other information that will help you specify the fonts you want to buy.

Commercial Fonts Online. A few online services accept a credit card and let you download commercial fonts. DTP OnLine, on CompuServe, has the full Adobe and Monotype libraries and is working on the full Treacyfaces/Headliners library; Design OnLine has fonts from several of the smaller design companies, including Alphabets*Inc. Emigre sells directly from its own Now Serving BBS. This is very likely the way we'll all buy fonts in the future, since it solves distribution problems for manufacturers as well as for users.

Unlocked CD-ROMs. It's difficult to recommend most of the commercial CD-ROM collections of unlocked fonts (as opposed to pay-as-you-go CD-ROMs). Moreover, most of these CD-ROM collections include only display fonts. These discs are also too often filled with hastily made knockoffs of commercial fonts, a mishmash of shareware fonts (often being distributed without permission), and other fonts of dubious quality or attribution. This isn't always the case — for example, Bitstream's unlocked CD-ROMs offer beautifully drawn fonts, although some are unlicensed.

There's another reason to avoid the large CD-ROM collections: Getting a huge influx of fonts all at once, most of them with unfamiliar names, is confusing. The best way to build a type library is to purchase a family or two at a time and then use each family extensively until you have a good feel for its strengths and weaknesses.

There's Always Shareware. Decent shareware fonts were once a rarity, but I've been surprised recently at the high quality of some shareware display fonts. All the online services have libraries of shareware fonts. It's a resource that's worth exploring as the business of buying and selling fonts moves to the online world.

Kathleen Tinkel writes regularly about fonts, graphic design, and prepress.

TEXT FONTS

Bulmer
Monotype

Caecilia
Adobe

Caslon
Adobe

Charter
Bitstream

Dante
Monotype

Forever
Treacyfaces/Headliners

Garth Graphic
Agfa

Madison
Bitstream's Century 725

Rotis Sans
Rotis Semisans

Rotis Serif
Rotis Semiserif
Agfa

Utopia
Adobe

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415-961-4400
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http://www.adobe.com/

Agfa
Wilmington, MA
U.S.: 800-424-8973
508-658-5600
508-657-8268 (fax)
Canada: 800-387-9532
416-241-5409 (fax)

Bitstream
Cambridge, MA
800-522-3668
617-497-6222
617-354-7954 (fax)

ITC (International Typeface Corp.) and Letraset
New York, NY
800-343-8973
201-845-6100
201-845-4708 (fax)

Linotype-Hell
Hauppauge, NY
800-799-4922
516-434-2700
516-434-2706 (fax)

Monotype Typography
Chicago, IL
800-666-6897
312-855-1440
312-855-9475 (fax)

A FEW INDEPENDENTS

Alphabets*Inc.
Evanston, IL
800-326-8973
708-328-2733
708-328-1922 (fax)
Design OnLine:
http://www.dol.com/fontsonline/

Carter & Cone Type
Cambridge, MA
800-952-2129
617-576-0398
617-354-4146 (fax)

Emigre
Sacramento, CA
800-944-9021
916-451-4344
916-451-4531 (fax)
Now Serving BBS:
916-451-2853; http://www.emigre.com/

The Font Bureau
Boston, MA
617-423-8770
617-423-8771 (fax)

Hoefler Type Foundry
New York, NY
212-777-6640
212-777-6684 (fax)

House Industries
Wilmington, DE
800-888-4390
302-888-1218
302-888-1650 (fax)

Patricia Lillie
(shareware, $10)
71762.54@
compuserve.com

David Rakowski
(freeware)
Optional voluntary contribution to
Columbia Composers,
Columbia University
CompuServe: DTP Forum

Stone Type Foundry
Palo Alto, CA
800-557-8663
415-324-1870
415-324-1783 (fax)

[T-26]
Chicago, IL
312-670-8973
312-649-0376 (fax)

Treacyfaces/Headliners
West Haven, CT
800-800-6805
203-389-7037
203-389-7039 (fax)

Brian Willson/ Three Islands Press
(shareware, $10)
76662.2364@
compuserve.com

FONT RESELLERS

DTP OnLine
CompuServe: GO DTPONL
Sales; GO DTPAVEN
Support/Information

FontHaus
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203-367-1860 (fax)

FontShop USA
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312-360-1997 (fax)
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416-593-4318 (fax)

Phil's Fonts
Silver Spring, MD
800-424-2977
301-879-0601
301-879-0606 (fax)

Precision Type
Commack, NY
800-248-3668
516-864-0167
516-543-5721 (fax)

Image Tricks for Acrobat

A quick checklist of Photoshop tweaks to help your print documents distill gracefully into PDF files.

DISTILLING A DOCUMENT for electronic distribution may sound easy: Just print from your page-layout program to a PostScript file and process it with Adobe Acrobat Distiller, and your paper-oriented publication turns into a PDF (Portable Document Format) file, ready for posting to the Internet or distribution on CD-ROM. However, making PDF files that look good on-screen, display quickly, and download quickly requires that you step through the various files placed in your layouts — be they EPS illustrations, CMYK TIFF images, or DCS files — and convert them to formats that are better suited for use with Distiller.

Following this checklist before you create your PDF file will help you end up with a strong digital representation of your original document, rather than a pale imitation of its paper form.

MacUser *associate editor Jason Snell uses Acrobat to publish the fiction magazine InterText on the Internet (http://www.etext.org/Zines/InterText. He is also the coauthor of* Providing Internet Services via the Mac OS *(Addison-Wesley).*

1. CONVERT EPS ILLUSTRATIONS TO BITMAPS, FOR FASTER RENDERING

A. WITHOUT CONVERSION

B. WITH CONVERSION

STEP BY STEP

1. CONVERT EPS ILLUSTRATIONS TO BITMAPS, FOR FASTER RENDERING. Acrobat Reader renders graphics on-screen as you turn the virtual pages of a document — and pages that contain complex graphics can sometimes turn very slowly indeed. The biggest culprit in slowing down page-rendering time in Acrobat Reader is the EPS illustration, created in such applications as Adobe Illustrator and Macromedia FreeHand. Since Acrobat must redraw EPS illustrations object by object every time you change magnification or scroll through the page containing them, even one such item can dramatically slow things down.

Before you create a PDF file, rasterize your placed EPS illustrations. The quickest way to turn these vector illustrations into bitmaps is simply to open the EPS files in Photoshop (File: Open), which automatically performs the conversion for you. While you're in Photoshop, check the Anti-aliased option and set the resolution to 72 dpi in order to make each EPS file as small as possible. FreeHand 5.5 users should save their illustrations as Illustrator 5.5 files (File: Export) before opening them in Photoshop.

A comparison of the rendering times shows the benefits of converting an EPS file to a bitmap. After three seconds of drawing time, Acrobat had barely begun to render the original EPS illustration (A), but three seconds was all it took for Acrobat to render the entire page containing the rasterized version of that illustration (B). The resulting Acrobat file was also one-third smaller than the original.

2. CONVERT IMAGES TO RGB COLOR, FOR BETTER QUALITY. Acrobat Distiller 2.0 isn't nearly as agile at compressing or displaying CMYK images as it is with RGB images. You should open any placed CMYK TIFF

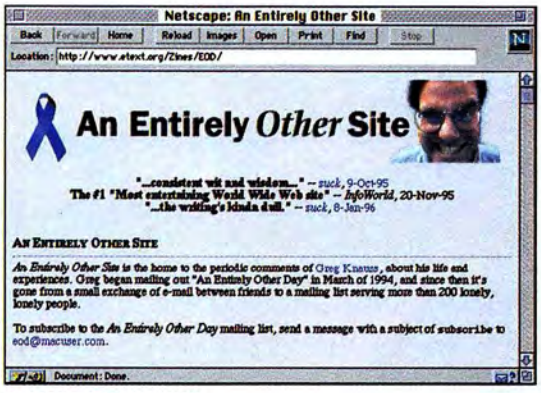
2. CONVERT IMAGES TO RGB COLOR, FOR BETTER QUALITY

A. WITHOUT CONVERSION

B. WITH CONVERSION

3. USE LOSSLESS COMPRESSION ON DETAILED IMAGES

A. LOSSY COMPRESSION



B. LOSSLESS COMPRESSION

files in Photoshop and convert them to RGB color (Mode: RGB Color). Then resave the files and replace the originals in your layout with the converted ones.

RGB conversion is particularly important for photographic images saved in DCS EPS format (one master file and four CMYK separation files), a format common in professional color publishing. When you print a layout containing such an image to a PostScript file, only the low-resolution preview (A), not the original high-resolution CMYK image, is used. To prevent this substitution, open the DCS EPS file in Photoshop, convert it to RGB Color mode, and save it as a TIFF file. Doing this will maintain the quality of the original EPS file in the resultant PDF document (B).

3. USE LOSSLESS COMPRESSION ON DETAILED IMAGES. Distiller's default process employs JPEG, a lossy-compression system, to compress all images that appear in the source PostScript file (A). But you can use a simple trick to preprocess detailed images, such as computer-screen dumps, so Distiller won't lose crucial data during the compression process.

Use Photoshop to make individual photos in your document immune to Distiller's JPEG compression by converting them to 8-bit-color or 4-bit-grayscale images. Select Indexed Color from Photoshop's Mode menu in order to convert a file to 8-bit-color mode. Select Grayscale to convert a file to Grayscale mode, a good choice for the dialog boxes common in computer documentation. When a file has been saved in either of these formats, Distiller will use a lossless-compression method on the image, thereby preserving the detail in the original (B).

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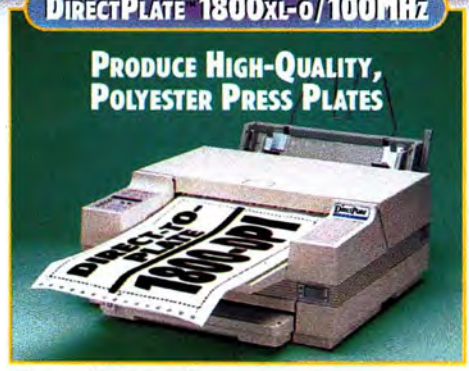

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EXPERT TIPS / By Bob Schaffel and Chuck Weger

Eliminate the Negative

And accentuate the positive by using new technologies to optimize production.

WHEN IT COMES TO transferring page layouts created on a computer to paper pages printed by a printing press, lots of terms are being bandied about these days: *direct-to-plate, computer-to-plate, direct-to-press, digital press.* It's almost as confusing as trying to figure out what people mean by *dpi.* (Hehhh? Are we talking output resolution, scanner resolution, monitor pitch, halftone-screen frequency? What?) Let's clarify the differences among these processes and discuss their production implications. Most of these technologies are here today and can save you time and effort (hence money), but only if you target them appropriately.

Some printing basics are in order to put us all on the same planet. It's safe to say that most commercial work today is produced on offset printing presses. Moving backward from the final printed product, it goes something like this: The printed page is created with ink transferred by a printing plate produced from film created from a page description (the collection of contents, ranging from typography to images to graphics). Page descriptions can be made with mechanicals — the traditional method of assembling type, photographs, and illustrations by hand on a drawing board — or from desktop-publishing programs — the method preferred by many today.

Desktop publishers have benefited from the increased power and decreased cost of computers. The prepress industry is trying to harness this power to circumvent one of the most expensive parts of the printing process — using film to create printing plates. Indeed, we'd like to get rid of the plates altogether. Not only might the expense of film, developer, and other materials be eliminated but a more direct path to the press can also reduce the possibility of waste caused by human error. So what are some ways to get rid of the film?

Direct-to-plate usually means that plate material is substituted for film inside the imagesetter. Some interesting new technologies that might be used for direct-to-plate include laser ablation, which utilizes the laser's heating properties rather than its photographic-exposure capabilities to create a plate image. One advantage of direct-to-plate is that one machine can produce a multitude of output types — the same imagesetter can expose paper, film, or flexible plate material — eliminating the need for a dedicated platesetter. The disadvantage is that these plates have a limited run life on a press; you can get only so many impressions before the plate wears out and has to be replaced.

Computer-to-plate (CTP) sounds like a generic description, but it actually refers to making plates with a dedicated device designed for the task, similar to an enormous imagesetter. Two of the major differences between CTP and direct-to-plate are that CTP plates last longer on the press and that CTP images look better. With the advent of very-large-format platesetters, it's possible to print many sizes of publications and prepare the press materials in less time. However, the plates are expensive, so you have to do careful economic analysis to target the appropriate jobs.

Burn, Baby, Burn

Direct-to-press covers several scenarios but usually refers to the process of "burning" a page image onto a printing plate that's already in place on the press. Heidelberg, a leading manufacturer of printing presses, has been at the forefront of this development with its GTO-DI and Quickmaster direct-to-press machines. Both the Quickmaster and the GTO-DI are regular offset presses that use plate materials similar to the ones used traditionally, so the plates last longer than those used in direct-to-plate and CTP. Because the plates are already in position on the press, makeready time is shorter too. Image quality, however, left something to be desired on the earlier GTO-DI, and it wasn't embraced by the industry. The Quickmaster offers better image quality and faster speeds than the GTO-DI, so the market seems to have been convinced that direct-to-press has economic viability, but it's taking Heidelberg longer than expected to deliver the technology.

Finally, the digital press skips the film and printing plate entirely. Engines made by Xeikon and Indigo behave like superhigh-quality four-color laser printers. Without a fixed image plate, digital presses give us the ability to customize and personalize each page of a publication — a feature that advertisers, retailers, and publishers would love to take advantage of. Quality, flexibility, and cost are still major issues with this technology, but there are big market potentials.

Sounds great. But there is still a big stumbling block to the adoption of these technologies: People in the printing industry are used to seeing off-press proofs of film before committing to a print run. These proofs are traditionally made from the same film that is used to make the plates. Digital proofs that provide accurate color guidance, trapping information, and verification of page composition are only just beginning to find market acceptance.

But solving the remaining hurdles to acceptance would be more than worth the effort. Reduced preparation time, increased precision, faster press makeready, and less waste due to improper film handling and processing are compelling reasons to eliminate film and accentuate the positive aspects of an altered work flow.

Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a consultant and the conference chair for CONCEPPTS 96.

ILLUSTRATION / JOHN OSSINO

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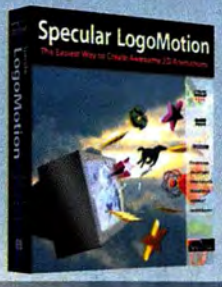

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CIRCLE **67** ON READER SERVICE CARD

Mapping on the Infobahn

NEW RESOURCES SPRING UP daily on the Web, but we've seen few as usefully packaged as MapQuest, a Web-based, interactive map service from GeoSystems. Built to access a powerful atlas database, MapQuest takes advantage of the interactive nature of Web access to deliver personalized content — maps, route directions, and so on — in a graphically appealing, easy-to-navigate Web site.

The basic services MapQuest offers Web surfers are an interactive atlas and a trip planner. The interactive atlas asks for locating information such as an address or a business name and then displays a bitmapped image of the requested location, built on the fly from GeoSystems' vector-based maps. The trip planner, called TripQuest, provides driving directions between two cities. Users who register at the MapQuest site can store their custom views and their search results on GeoSystems' servers for later retrieval.

In addition to being zoomable to street level in many U.S. locations, MapQuest's maps can be customized with icons representing points of interest — a user's own or some of the many designated by GeoSystems and its business customers. Businesses such as Inns & Outs, a listing service for bed-and-breakfasts, and Playbill On-line, a service that lists theater performances, are already linking their Web sites to MapQuest to provide maps and directions to their customers. As a side benefit, these businesses get to have their icons appear on relevant maps when users request information on a certain category. This arrangement makes MapQuest a useful model not only for interactive content but also for something few businesses have figured out how to do: making money from the Web.

/ Sean J. Safreed

WHAT:

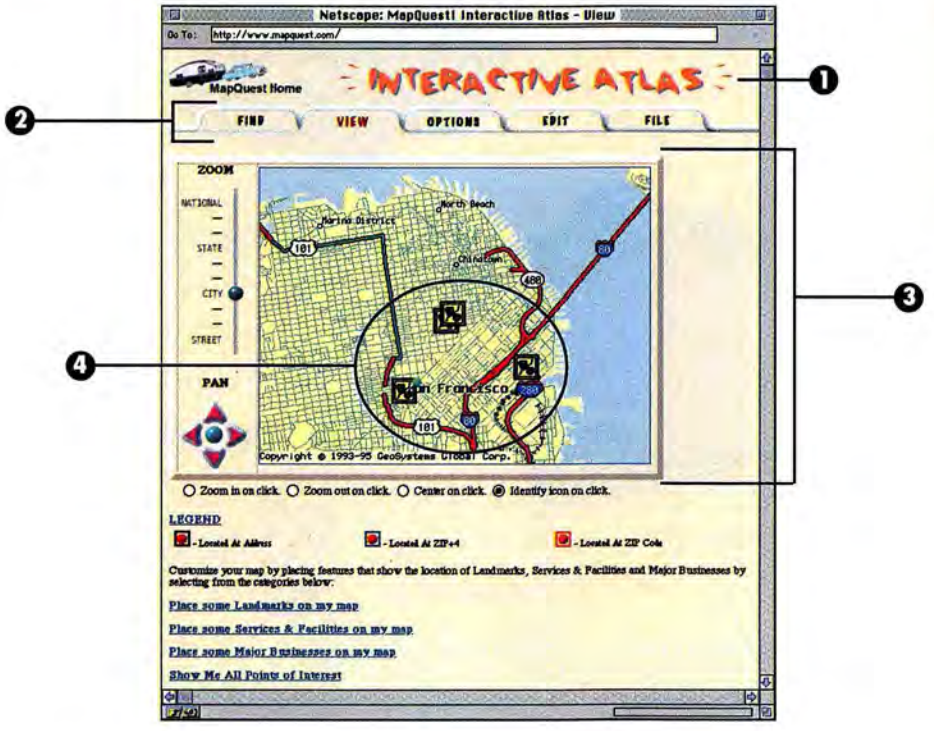
MapQuest, "the premier interactive mapping service for the Internet."

COMPANY:

GeoSystems Global, Denver, CO; 303-312-0200; http://www.MapQuest.com/.

TOOLS:

Web-server software on Sun and Silicon Graphics systems; GeoSystems proprietary searching and GIS databases; Adobe Photoshop, for manipulating photos and other graphics; artwork from PhotoDisc Retro Americana.



1. GRAPHIC STYLE. GeoSystems contracted with a graphic-design firm called The Internet Group, which created a retro style reminiscent of 1950s postcards to make the site fun and evocative of travel. The designers used photos from PhotoDisc Retro Americana and clip art that fit the style. The font for the section headlines — in this case, "Interactive Atlas" — was a shareware font called Cheap Motel.

2. NAVIGATION. The MapQuest site uses a simple, tab-based folder metaphor to provide access to its various options for searching, viewing, customizing, and saving maps. For example, the FILE tab takes you to a page where you can save, recall, and delete various map views on the MapQuest server, using a simple HTML form.

3. THE MAP. Each MapQuest map is built at a user-specified size as a GIF file from the vector data of streets and landmarks in GeoSystems' extensive map database; you can access various levels of detail within the main window. The slider on the left lets you change the detail level of the map (shown is a city-level map of San Francisco), and the Pan button moves you beyond the section currently shown. As you click on the map, or pan and zoom, the server creates a new GIF that reflects your current view.

4. POINTS OF INTEREST. A map is more useful if it contains the landmarks and other points of interest you're looking for. Fortunately, MapQuest provides a long list of interest categories for you to choose from. You can opt to have icons appear on the map for hotels, restaurants, parks, theater offerings (as shown here), and many other items — including your own custom points of interest.

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CIRCLE 4 ON READER SERVICE CARD

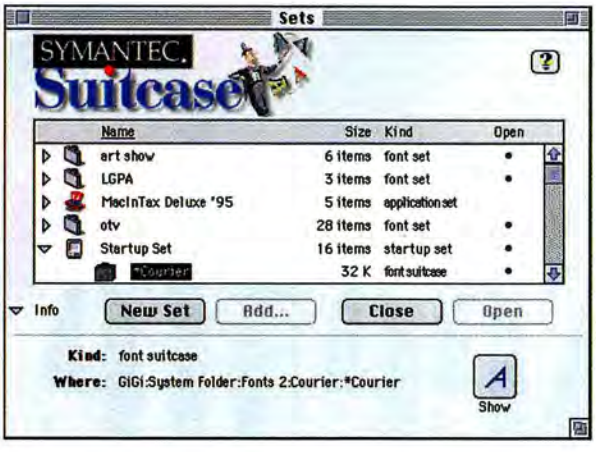
Manage Font Mania

THOUGHT YOU HAD all the font-management utilities you needed? Check again. Among the latest digital type tamers are a new version of Alsoft's venerable MasterJuggler, now in version 2.0; Symantec Suitcase 3.0; and a relative newcomer from Insider Software, Font Box 1.7.

MasterJuggler 2.0. Alsoft has spruced up the interface of MasterJuggler, adding drag-and-drop capabilities for both the opening and closing of fonts. Version 2.0 is now PowerPC-native and manages all font formats, including the QuickDraw GX format. With numerous fonts comes the problem of ID-number conflicts. MasterJuggler can now automatically resolve these font conflicts. $89.95; upgrade, $19.95; competitive upgrade for Suitcase users, $39.95. 800-257-6381 or 713-353-4090.

Suitcase 3.0. ▼ Symantec has completely revamped this utility. Now delivered as an extension and an application, rather than as a DA, 3.0 is dedicated solely to font management. It sports a new — and greatly improved — interface that lets you drag folders and volumes of fonts from the Finder and drop them into the program. Version 3.0 also lets you create application sets that activate automatically when you launch programs. $70; upgrade, $40. 800-441-7234 or 541-334-6054.

Font Box 1.7. Plagued by corrupted, missing, or duplicate fonts? Check out Font Box 1.7. It roots out fonts wherever you may be hiding them; analyzes and repairs corrupted fonts; eliminates duplicates (including Type 1/TrueType duplicates); jettisons unnecessary point sizes from your bitmaps; consolidates bitmapped fonts into suitcases; renumbers all your font IDs; and builds you a brand-spanking-new, trouble-free font folder. The sheer joy of having Font Box report that it has found and fixed hundreds — or thousands — of font problems makes this utility worth the price. Personal Edition, $30; Preferred Edition, $70; Professional Edition, $160. 610-526-0600. / Henry Bortman



FINE PRINT

A Painter's Workshop

FOR THE PAINTERLY inclined among you, two new books from Peachpit Press should help you achieve your artistic aspirations. The first is ***Painter 3.1 for Macintosh: Visual Quickstart Guide,*** by Elaine Wienmann and Peter Lourekas. Like other volumes in the Quickstart series, it walks you through Painter's capabilities, starting in this case with the basics of brushwork and then moving on to selections, masks, fills, effects, and even moviemaking. $20. The second, ***The Painter Wow! Book,*** by Cher Threinen-Pendarvis and Jim Benson, is for more-advanced users. Lavishly illustrated with full-color examples, this book takes you step-by-step through dozens of special effects and techniques that will let you take Painter to the limits of creativity. The accompanying CD-ROM contains custom paper and brush libraries and over 100 stock art photos. $40. Peachpit Press, 510-548-4393. ▶ You may also want the insights of art pros regularly. The newsletter ***Artistry,*** published ten times per year by Karen Sperling, will keep you up-to-date on getting the most out of Fractal Design Painter. It includes tips and tricks from traditional painters working on Painter's digital canvas. Annual subscription, $49.95. 212-737-7664. / Henry Bortman

Plying the Sound Canvas

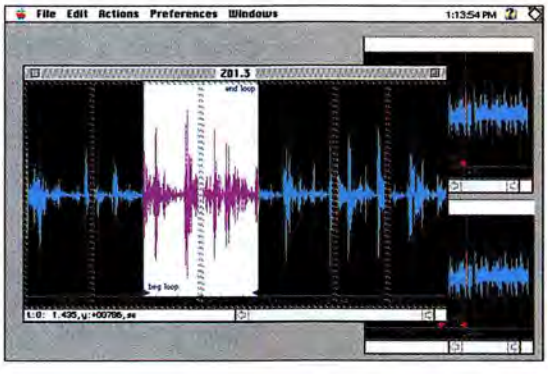
TWISTING SOUNDS doesn't require a Power Mac, especially if you have Peak, the new audio-editing program from Berkeley Integrated Audio Software (BIAS). And for professional musicians looking to use the Mac's QuickTime MIDI capability, InVision has updated CyberSound VS.

Peak. ▼ Users have a lot of options for editing audio on the Mac, from Macromedia's SoundEdit 16 to Digidesign's high-end Sound Designer II. BIAS' Peak is the first to offer nondestructive editing capabilities in a two-channel editing program. Nondestructive editing ensures that the original sound files are unchangeable and incorruptible during the editing process. Furthermore, it offers unlimited undo of editing commands and unlimited zooming of the waveform display. And because Peak redraws all waveforms in the background, the audio-editing process is completely interactive.

Peak reads AIFF and Sound Designer II files and imports QuickTime audio tracks as well as audio from CDs. The next version of Peak will also support the WAV format, common on Windows.

BIAS offers four Peak Accessory Paks to expand Peak's capabilities: the Composer/Designer Pak, which adds effects such as pitch changing; the Sampler Pak, for working with MIDI samplers; the Audio Librarian Pak, for cataloging sound samples; and the Audio Pro Pak, featuring tools such as a "declicking" filter that removes clicks from your sound files.

Until June 30, BIAS will include all four Accessory Paks at no extra charge when you purchase Peak. $299. 800-775-2427 or 415-331-2446.



CyberSound VS 1.01. InVision's replacement for QuickTime's MIDI synthesizer should be more appealing to professional musicians now that version 1.01 is out. To make the nine sound banks that ship with CyberSound VS more responsive, InVision has completely reworked them. Now, for example, if you play a note on a MIDI keyboard, the CyberSound synthesizer on your Mac responds almost as quickly as a hardware MIDI synthesizer, making the software suitable for professional performances. The update, including the new sound banks, is free to all registered users. 415-812-7380. / Sean J. Safreed

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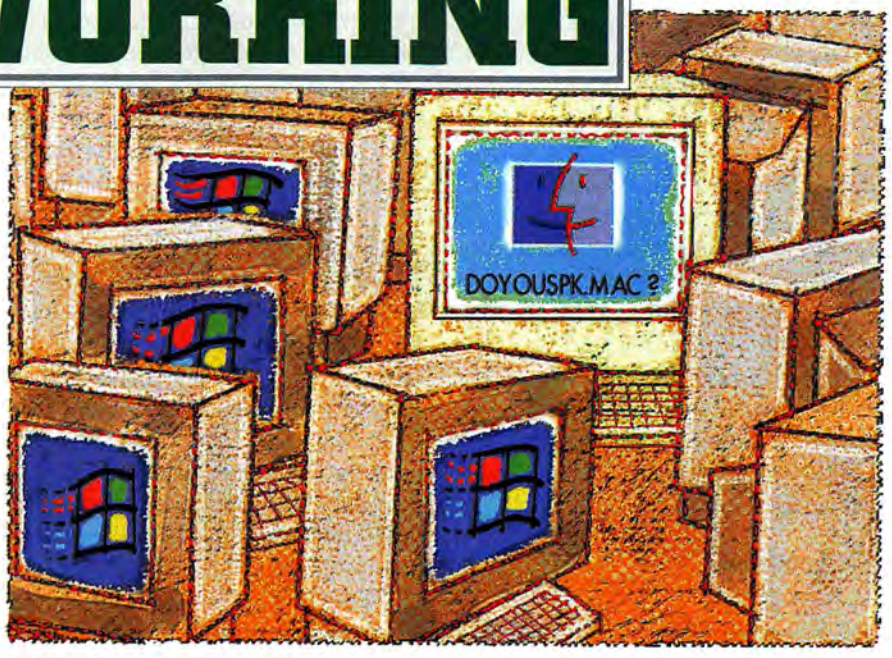

You can have your Mac and share files with Windows users too.

By John Rizzo

Surviving in a Windows World

WINDOWS IS EVERYWHERE. It's on the desks of your coworkers and clients. Now they're giving you Windows files and expecting the same in return. Is it time to trade the Mac OS for Windows 95?

Fortunately, nothing that drastic is necessary, because your Mac can read and transfer PC files — sometimes with system software, sometimes with a little help. System 7.5 includes several cross-platform features you can augment with a small toolbox of utilities, many of which are available online. There are even Windows utilities that make PCs more friendly to Mac files.

Working with files created on another kind of computer involves two basic operations: transfer and translation. To use a PC file on the Mac, you must be able to get it onto your hard disk or mount a PC-formatted floppy or removable-media cartridge on the desktop. File translation becomes important when you want to open files created in a format the Mac doesn't automatically recognize.

Knowledge Transfer

All PCs, whether they're running Windows 3.1, Windows 95, or OS/2, use DOS formatting for floppies and removable media. Your Mac can read and format DOS floppies with PC Exchange, a control panel included with all versions of System 7. If you also want DOS-formatted SyQuest, Zip, and magneto-optical cartridges to mount on your desktop, replace PC Exchange with AccessPC ($69), from Insignia Solutions (800-848-7677 or 408-327-6000) or DOS Mounter 95 ($89), from Software Architects (206-487-0122). DOS Mounter 95 should be your choice if you need to format Macintosh as well as DOS partitions on a single disk. Copying files to and from removable cartridges is also quite a bit faster with DOS Mounter 95 than with PC Exchange or AccessPC.

PCs aren't particularly Mac-friendly out of the box, but several utilities let PCs read and format Mac removable media. The best buy is MacOpener ($75), from DataViz (800-733-0030 or 203-268-0030), which can also read Mac CD-ROMs. MacOpener lets Windows users preview Mac text and graphics files. It also comes with a file-transfer utility for moving files via a network. Other noteworthy Mac disk utilities for Windows are Software Architects' Here and Now ($89) and Mac-in-DOS Plus ($189), from Pacific Micro (415-948-6200). Their features are generally on a par with those of MacOpener, except that neither of them can preview graphics files or work with Mac CD-ROMs. TransferPro ($409), from Digital Instrumentation Technology (800-467-1459 or 505-662-1459), is pricey but adds the ability to translate three dozen Mac, PC, and UNIX graphics file formats to its support for Mac disk mounting.

Mac and PC disk-sharing utilities all take care to display the proper filenames on each platform. The Mac OS and Windows 95 use "long filenames," whereas DOS/Windows 3.1 use the "8.3" format — 8 characters maximum, followed by a dot and a three-character extension, which tells the PC which application created the file. These utilities include a feature called extension mapping. It associates the DOS extension with the invisible Mac type and creator codes, which tell the Mac which application created the file and what type of file it is. You can set extension mapping to enable SimpleText to open PC documents ending in .TXT, for instance, or Excel to open files ending in .WKS.

Not all file transfers involve handing over a disk. Internet mail messages increasingly deliver files too. Documents attached to such messages traverse the Net as binary files.

ILLUSTRATION / SUSAN LEVAN

Mac mail readers usually have no problem decoding binaries sent from PCs as BinHex, the standard binary format. Some mail readers take the next step and automatically translate the BinHexed files into their original formats. If yours doesn't, the BinHex information will appear at the end of the e-mail message or in a separate file that must be decoded. If BinHex information (which looks like line after line of garbage characters) is included in a mail message, you'll need to copy it to a new SimpleText file and decode it with a utility such as the freeware BinHex4 or Aladdin Systems' StuffIt Deluxe. If you e-mail a file to a PC user from a Mac, be sure to turn off your mail reader's MacBinary transfer option. Otherwise, the PC user won't be able to read the file. Use ordinary binary if your mail reader has this option.

File Translation

Getting a file onto your Mac doesn't guarantee you'll be able to read it. Many major PC word processors, graphics applications, and databases share file formats with the Mac, but many don't. Even software that's available for both platforms sometimes needs a little help.

Fortunately, lots of help is available, from both the Mac OS and third-party offerings. System 7.5 includes several MacLinkPlus file translators from DataViz, which automatically translate a PC word-processing, spreadsheet, database, or graphics file when you double-click on it. If you have older system software, you can buy MacLinkPlus and a slew of translators (packages start at $109) from DataViz. DataViz also offers a version of MacLinkPlus for Windows called Conversions Plus ($149).

MacLinkPlus generally does a good job of translating files but is not the best tool for use with graphics files, which are tricky to translate. Typical problems include shifts in color, line-weight changes, and loss of fonts. Adobe Photoshop can translate many formats and has the tools you need in order to fix typical problems but is an expensive option if you don't already use it. Even better is DeBabelizer ($399), from Equilibrium Technologies (415-332-4343). Version 1.6.5 can translate more than 70 bitmapped Mac, PC, and UNIX graphics and animation formats, including GIF, JPEG, and QuickTime. It also supports the Acquire, Filter, and Export Photoshop plug-ins for adding special effects. DeBabelizer includes tools that allow you to view and work with the files you translate.

Transverter Pro 3.0 (Mac and Windows), from TechPool Software (800-925-6998 or 216-291-1922), translates and corrects vector-file formats, including PostScript and EPS. It can also translate Adobe Acrobat PDF (Portable Document Format) files into EPS format, rasterize vector files, and add anti-aliasing. Besides the Windows-only TransferPro, mentioned earlier, Transverter Pro is the only one of these programs with a Windows version.

Both DeBabelizer and Transverter Pro let you work with files before you translate them, allowing you to compensate for known conversion-related glitches. Transverter Pro, for example, gives you two ways to avoid embedding fonts in graphics files — embedded fonts are particularly difficult to translate. You can use PostScript Type I DOS fonts on your Mac or convert the text to graphic outlines.

System 7.5 makes a good starting place for file- and disk-based transfer and translation. Try its tools on PC files you receive. If the system's built-in capabilities don't cut it, move up to a more sophisticated package that specifically handles the media and/or file formats you use most often.

John Rizzo is a chief sysop on ZD Net/Mac and the author of How Macs Work, *from ZD Press.*

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NET TRAVELER / By Michael Swaine

Searchin' Safari

Find the perfect Internet search engine.

YOU KNOW THE NET is a mighty information source. But how do you find specific sites or pieces of information? By using a search engine, you can greatly increase your chances of locating just what you want. These Web sites are the hunter-gatherers of the Net. They plumb their own databases and others around the world, returning lists of Web pages, FTP sites, and even Usenet messages that contain the keywords you've entered. But like other Web entities, not all search engines are created equal. Here are some basic guidelines for using search engines, and a look at a few of the best ones:

Search Strategies. Starting a search couldn't be simpler: Type one or more words into a one-line search field, and get back a list of links to sites where those words occur. With most search engines, you should use only lowercase characters — unless case matters. Typing *politics Dole* may help you locate the Kansas Senator's position papers, whereas *politics dole* is just as likely to lead you to polemics on the welfare system.

Punctuation and the order of the words in your query are generally ignored, so *Dole Bob* is equivalent to *Dole, Bob* and to *Bob Dole*. Quotation marks can turn several words into one term, so the query *"Bob Dole"* leads you only to sites where *Dole* follows *Bob* as closely as politicians follow polls.

Don't expect your search to return results that perfectly match your information needs. If your query is broad, and sometimes even if it isn't, the links a search engine returns will vary widely. Some links will represent sites where your keywords are merely an incidental part of the narrative. Other links will require some exploration, and a few may unlock a treasure trove of useful information. That's the nature of many search engines that don't have sophisticated pattern-matching capabilities and that have advanced options lying hidden under an explanatory link.

Default Searchers. The two Net search engines that could be considered preeminent are Infoseek (http://home.netscape.com/home/internet-search.html), which is also accessible from Netscape Navigator's Directory menu (Directory: Internet Search), and Yahoo! (http://www.yahoo.com). Infoseek is a frequent first stop, because it's so convenient for Netscape Navigator users. You can choose to search the Web, newsgroups, or Usenet FAQs. Your query is likely to return a large number of links, many of which are not closely related to your search. Yahoo! is a rich hierarchical database of sites as well as a powerful search engine. It's a good place to find a specific site, because it's often the first place companies and individuals list their Web sites; this, for better or worse, is really the main source for new sites in the database. The search engine can scour Yahoo! or the entire Internet, treating the terms in your query either as words or as substrings. Substrings allow you, for example, to find *Steve Jobs* without missing references to *Steven Jobs*. You do run the slight risk of picking up a listing of *jobs* for Net-savvy *stevedores*, however. Yahoo!'s integration of a search engine with its own database lets you trace the hierarchy down to a category such as *architecture* and then narrow your search within that category.

Wanting It All. If Yahoo! and Infoseek efficiently locate the information you want, they'll be all you need, but using an engine that everyone else does also puts you in competition for a scarce resource. Some other search engines offer more options and may be faster.

One alternative, Alta Vista (http://www.altavista.digital.com), from Digital Equipment's Palo Alto labs, is a real power user's search engine. It offers simple as well as advanced queries, performs proximity searches (finding *mine* only if it is near *coal*, for example), and does full Boolean searches — enter *Jobs and (Steven or Stephen)* to find *Steve Jobs* even if you're not sure how he spells his name.

Alta Vista also enables you to specify words to exclude or require, so if you're interested in the musician *Doc Watson*, you can focus your search by requiring the words *Doc* and *Watson* but excluding any pages that also have the words *Sherlock* and *Holmes*.

There are many other search engines, each with its own unique virtues. Some people like the Lycos (http://www.lycos.com) engine's ability to narrow searches incrementally. The Excite engine (http://www.excite.com) goes beyond keyword matching, with something it calls "concept searching." In addition to Web sites, Galaxy (http://www.einet.net/cgi-bin/wais-text-multi) allows you to specify Gopher or Telnet resource searches. WebCrawler (http://webcrawler.com) is a good choice for those who don't aspire to become expert searchers: It offers good beginner help and an interface that doesn't require a forms-savvy browser.

If you don't find a tool that meets your needs, why not search for that ultimate search engine. Just enter *"search engine"* as your query (and don't forget the quotation marks).

Don't Know a Yahoo from a Lilliputian?

MacUser maintains a list of frequently asked questions (FAQs) about the Internet, *MacUser* itself, and this column specifically. Send mail to faq@macuser.com. *MacUser*'s address on the World Wide Web is http://www.zdnet.com/macuser. You can reach me at traveler@macuser.com.

ILLUSTRATION / OCTAVIO DIAZ

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HANDSon

Reading, writing, and burning — here are the basics for putting your music on CD.

By Christopher Breen

Roll Your Own Audio CDs

ONCE UPON A TIME, writing audio CDs was best left to professionals or to those few hobbyists with seemingly endless supplies of patience and disposable income. Ah, but as that Zimmerman fellow so poetically crooned, "the times, they are a-changin'." The prices of CD writers (also known as *burners*), hard drives, and media have plummeted; Power Macs capable of digitizing CD-quality audio are now commonplace; and reliable writing software has replaced the quirky utilities of old.

Although burning CDs isn't the chore it once was, there are still a few tricks that will help you avoid errors that turn CDs into nothing more than expensive drink coasters. Here's how to avoid producing a seedy CD.

CD Writer's Shopping List

Before you can lay your tracks onto disc, you need the proper hardware and software. For a Mac-based CD-recording setup, you need these items:

• **A suitable Mac.** You need a Mac with 16-bit-audio-recording capability. All Power Macs and Quadra AVs, as well as some PowerBooks (the 190, 500, and 5300 series), come with this capability built-in. You can also use other 680x0 Macs if they sport a 16-bit digital-audio card.

• **A CD writer with a suitable RAM cache.** CD writers sport RAM chips that act as holding areas, or *buffers,* for incoming data. Should your hard drive momentarily burp and cease to deliver data at an acceptable rate, the writer will continue to pull data queued up in the buffer. If the buffer empties and your hard drive fails to keep up with the writer, the disc will be hosed. A tiny buffer leaves your hard drive with little margin for error.

You shouldn't have to worry about the capacity of the buffer unless you buy a used writer. Early writers had a paltry 32K buffer, which made burning CDs a nail-biting experience. Look for one with at least 512K (which is the lowest-capacity buffer most modern CD writers have) or one with an expandable buffer.

• **A powerful hard drive.** You need one that's high-capacity, fast, and able to suspend thermal recalibration. Thermal *what!?* Hold on, we'll get to that. First, let's establish the other requirements of a hard drive suitable for the CD-writing process. Since digital-audio files are huge, plan to buy at least a 1-GB drive. And to avoid errors when you're burning the CD, you'll need a fast drive — one with an access time of 18 milliseconds or faster.

As for recalibration: Every once in a while, your hard drive likes to take a break for self-examination and readjustment. This period of reflection is known as *thermal recalibration* and can play havoc with digital-audio files that are supposed to stream seamlessly off the hard drive. For burning CDs, you need a drive that can be instructed to turn thermal recalibration off while reading and writing data. Ask the maker of your CD writer to suggest appropriate hard drives.

• **High-quality SCSI cables.** These aren't a mandatory item, but they will guard against writing errors. You can usually pick out the best cables by checking their price and girth — bigger is better. They're fat to accommodate twisted pair wiring, a grounding wire, and a woven shield around all the wires.

• **Recordable CDs.** Both the brand and the capacity of a CD can make a difference in how successful the burning process is. Whenever possible, use the media recommended by the CD writer's manufacturer, since writers are "tuned" to work with certain brands of CDs.

Also, avoid high-capacity discs if you don't need the extra space: 74-minute discs spin

ILLUSTRATION / ROBERT ZAMMARCHI

slower than their 63-minute counterparts, and this can lead to less-accurate writing.

• **Appropriate CD-writing software.** This software comes in two flavors: professional and nonprofessional. The kind you need depends on how much you want to customize the disc and whether or not you plan to send the disc to a mastering house. Nonprofessional programs — such as Toast CD-ROM Pro, from Astarte (612-483-5338), and Gear, from Elektroson (800-606-6116 or 610-617-0850) — cost less (around $300) but are limited. Such programs are appropriate for burning discs if you don't need to vary the length of silence between tracks (spaces are usually restricted to two seconds) and if you plan to use the disc just for personal use — say, to play in your car.

If you want more control or will be sending a burned disc to a mastering house, you'll have to fork out about $1,000 for such professional software as CD-DA, from Astarte, or MasterList CD, from Digidesign (800-333-2137 or 415-306-0974). Most mastering houses won't stand for even one error on a disc. Professional software guards against errors by letting you write CDs from beginning to end without stopping (a process called *disc-at-once*). With nonprofessional software, on the other hand, you often have to use *track-at-once* writing, which stops the writing process between tracks. That's where the errors come in — as the software stops writing between tracks, the laser burns into the CD a bit of digital garbage, also known as an E32 error. (Several older CD burners do not support disc-at-once. Call Digidesign's fax-on-demand service at 415-598-4315, and request document 136 for a list of burners that do.)

Besides not introducing errors, professional software is also superior in letting you customize your disc. You can perform such tasks as varying the length of silence between tracks, inserting cross-fades, and — in the case of MasterList CD — adjusting the volume of each track.

• **Professional sound hardware.** If you decide to use the professional writing software MasterList CD, count on spending at least another $1,000 for Digidesign's Audiomedia II 16-bit sound card (Digidesign's other, more expensive audio products will work too). You'll have to add such hardware even if your Mac has built-in audio capability. The other professional package we mentioned, CD-DA, works with either Digidesign hardware or the built-in audio of 16-bit-capable Macs.

Prepare Your Hardware

Once you've gathered all the pieces you need for the burning process, the next step is to create the proper environment for a successful burn. It requires only two steps:

• **Simplify your SCSI chain.** String together only the devices you'll need for writing the CD: the Mac, the writer, and the drives you'll be using for audio data.

• **Prevent interruptions.** Turn off AppleTalk, virtual memory, screen savers, file savers, fax software, automatic diagnostic utilities — in short, anything that might churn away in the background while your Mac is involved in the CD-making process.

Prepare Your Data

You've got exactly one shot at writing your audio data correctly, since recordable CDs are a WORM (write once, read many) medium. If you or your writer blows it, your shiny-coaster count increases by one. Here's how to prepare your data to maximize your chances of a successful write:

• **Create a clean space for your data.** To do this, create a partition on your hard disk large enough for your audio data and copy the data to the partition. Data that's not scattered from here to eternity will come off the hard disk more reliably. If the partition holds other files, defragment the disk. (Bear in mind that defragmenting can ruin copy-protected music software. Deinstall such software before defragmenting, or use a smart defragmenter such as ALSoft's DiskExpress II.)

• **Organize your data.** Arrange the music tracks from within your CD-writing software, sequencing the data as you want it to appear on the CD. Now is the time to also perform any customization you want, such as establishing the length of silence between tracks, setting the copy-protection flag, and determining start and stop times.

Ready to Burn

We're almost there. Now it's time to make one last crucial decision and take the burner for a test drive.

First, determine at what speed to write to the CD. Faster is better. If your writer supports 2x or 4x write speeds — and you can move the audio data reliably at these speeds — use them. Your job will be completed that much sooner. Again, the faster the disc spins, the fewer the number of errors generated.

Be warned that 4x recording of audio CDs can be a little tricky. You must have the right match of hardware and software for a burn to work at high speeds. For example, burning at 4x with MasterList CD through an Audiomedia II card works most of the time on a 16-bit-capable 68040 Mac or better. But if you substitute Digidesign's Pro Tools III in that same Mac-and-software setup, it's next to impossible to burn at 4x, due to Pro Tools' more complex audio-routing scheme. Check Digidesign's document 136 for a list of hardware components capable of 4x recording, but to be safe, you should preview each burn.

Most CD-writing software lets you preview a burn. With such software, you can take a dry run, in which you don't write anything to the medium but can check for errors before committing the disc.

The Final Cut

If you've taken these tips to heart, you're just about as prepared as a person can be. Call up the CD-writing software, start the burn, and go have a cup of coffee. It's now in the hands of the gods.

With the burn complete and the disc finalized, you should now possess a shiny miracle — a crystal-clear, 16-bit, fully functional audio CD made with your own two hands. Granted, the more-than-modest outlay of cash and time involved in the preparation of your disc may sting a bit, but that sting will seem minor compared to the slap borne by the next project in line — design and execution of the full-bleed, four-color CD sleeve.

Christopher Breen is a professional musician and MacUser *contributing editor.*

Is Copying Right?

You've got the Mac, burner, software, and media all straightened out, but there's still one more consideration: Are you breaking the law? Oh sure, you've read every manual's fine-print weasel admonishing you to "obey all applicable copyright laws" when duplicating copyrighted material. But what exactly *are* the copyright rules?

In a nutshell, Section 107 of the U.S. Copyright Code lets you make a single copy of copyrighted material for noncommercial, personal use. You can, therefore, make a CD containing a collection of your favorite disco hits from the '70s and play it in your home, in your car, or on a portable disc player without fear that the authorities will break down your door.

Things get dicey when you take that same CD and play it for a large group of people — say, on a tour bus, in a tavern, or over a commercial DJ service. Such broadcasting is considered a public performance — one for which the copyright holders must be paid.

By Bob LeVitus and Christopher Breen

Help Folder

Graphics alphabet soup, terminating SCSI problems, and a SIMMple solution.

File-Format Mumbo Jumbo

Q. How do I choose the best clip-art file format to use for making up flyers and brochures that will be printed on a non-PostScript printer? Some clip-art collections are in EPS, and others are in TIFF. I also see some in the PICT and BMP formats. We own an HP DeskWriter 540 printer and use ClarisWorks and Microsoft Word.

Steve Hossner
via the Internet

BOB: If this were a magazine devoted exclusively to publishing, we'd riff on for a few thousand words about the various graphics file formats — TIFF versus PICT versus EPS (forget BMP, an icky PC file format). At the end, you still wouldn't know which one was best for you.

CHRIS: You would probably be bored silly to boot. Let's get to the point: Ninety-nine percent of the time, you'll be fine with PICT. This file format is the closest thing we Most Righteous and True Mac people have to a "standard" graphics file format. Besides, PICT can work with non-PostScript printers and just about any software package that supports graphics.

BOB: ClarisWorks had trouble opening some of my TIFF files but opened, with aplomb, all the PICT files I could throw at it. And you can't open EPS files with any of the software you own — you need expensive graphics packages such as Adobe Illustrator and Macromedia FreeHand to edit EPS files. Pick PICT, and be safe.

CHRIS: And because it's the most popular graphics format on the Macintosh, you'll find a veritable dump-truck-full of PICT clip-art collections to choose from.

Mac Archaeology

Q. After the unfortunate demise of my beloved Uncle Gunter, I became the recipient of his computer, a 512K Macintosh. Now that I possess a genuine MacAntique, I would like some original software to run on this baby. Is there anywhere I can get ahold of a copy of early versions of such applications as MacWrite and MacDraw?

F. Potvin
via America Online

CHRIS: F., your position is not unlike that of the lucky soul who inherits a 1963 Corvair — funky diamond-in-the-rough to some, rattling death trap to others. Just getting these mid-engine wonders to start up is tough enough, but finding spare parts through a dealership is impossible.

No, with your creaking putty-colored Mac, you must adopt the shopping strategy of ancient-car enthusiasts: clubs and flea markets.

BOB: And there's no better computer club than your local Macintosh users' group. Members may have copies of old software taking up room on their office shelves that they'd be willing to part with for the right price (maybe for free!). If you can't find what you want among members attending the meetings, try placing want ads in a user-group newsletter or on an online bulletin board.

CHRIS: Of course, if you do latch onto someone's hoary software, remember that you're buying only the license to use that product. If the company that made it is still around, send a note indicating that the license has been transferred and that the original owner is not the kind of worm who would continue to use a newer version of the program while selling off the old dreck. Using old software is legit only if the first owner has stopped using the original and all upgraded versions.

Determining Termination

Q. I have several SCSI devices attached to my Power Mac 6100 (an internal hard drive and a CD-ROM drive, as well as an external Zip drive and a scanner). The Mac keeps crashing and freezing, and I'm sure I'm having problems with the SCSI chain. How should I terminate these devices so everything runs smoothly?

Leland November
via CompuServe

CHRIS: You're discovering that SCSI is more faith than science. Science tells us we should terminate the first and last devices on the chain. Since your Mac has an internal drive, chances are the drive is terminated. All you need to do is slap a terminator onto the last device. But because SCSI is rarely predictable, you may have to break this rule or juggle devices on the chain.

BOB: I think juggling the scanner will solve the problem. Scanners can be really fussy. Some like to be at the end of the SCSI chain; others prefer the beginning. If the manual that came with your scanner doesn't recommend a particular position on the chain and you're having SCSI-related problems, try moving the scanner to the opposite end of the chain.

CHRIS: If you place the Zip drive — with its odd 25-pin connectors — at the end of the chain, you'll finally have a chance to employ one of the 25-to-50-pin cables that every SCSI-

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ILLUSTRATION / SAM KUO

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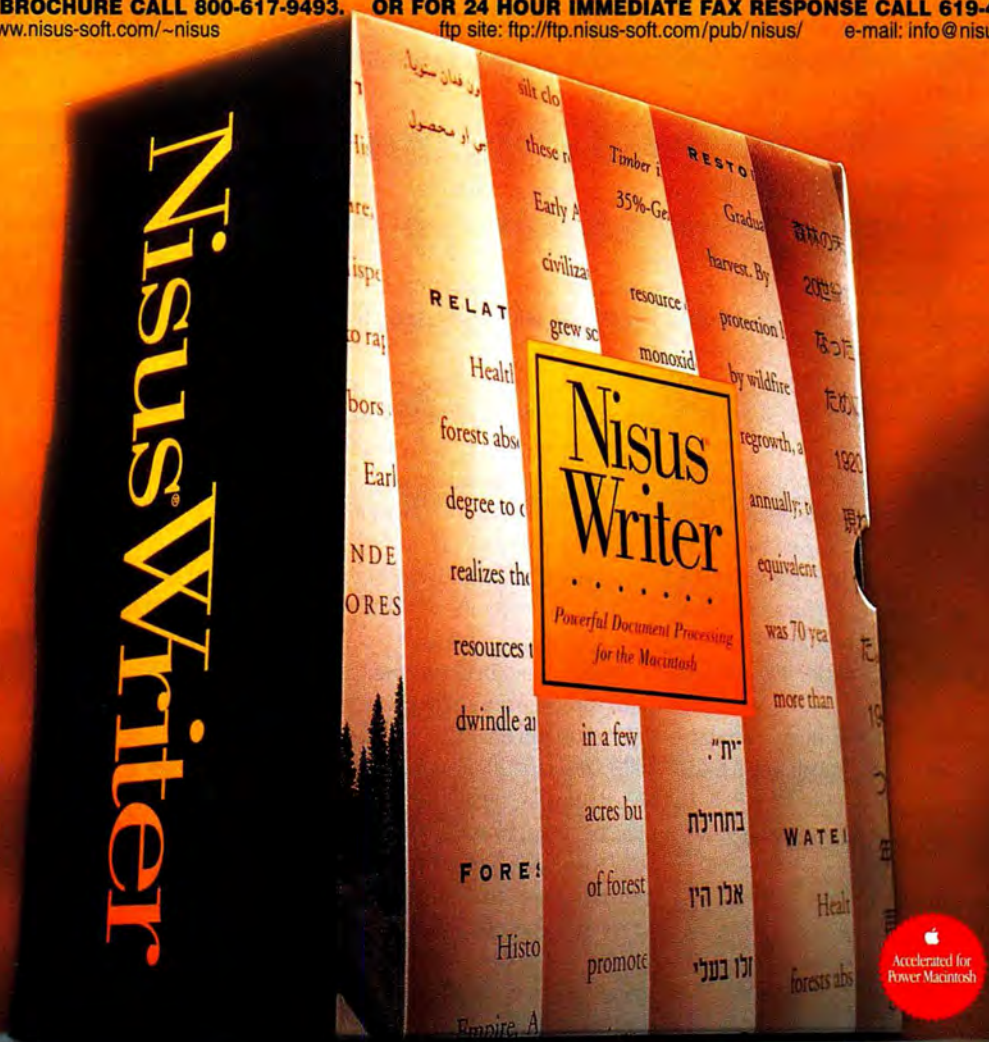

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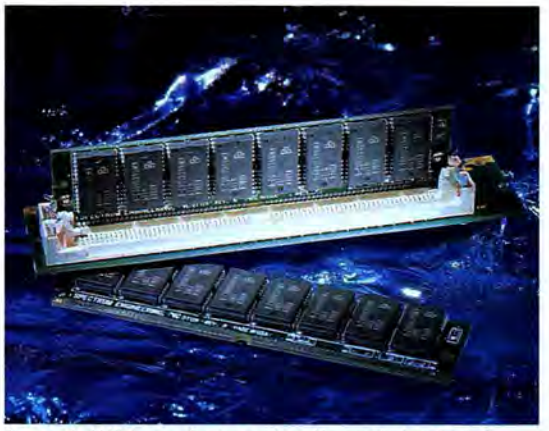

figure 1 / With an adapter such as Newer Technologies' DIMM Tree, you can use old SIMMs in your new Power Mac.

peripheral maker unthinkingly saddles you with. Just use one 25-to-50-pinner to go from the Mac to the scanner and another to get from the scanner to the Zip. Flip the termination switch on the Zip, and you're home free.

Am I Losing My Memory?

Q. Since all new Macs use DIMMs (dual in-line memory modules), should I bother to invest in SIMMs (which my current Mac, a Performa 636, requires)? Will it be possible to use an adapter to make those 72-pin SIMMs work in a 164-pin DIMM slot? Or do they become expensive trash when I buy a new Mac?

Richard M. Rose
Plainview, NY

BOB: First of all, with millions of SIMM-using Macs out there, there's not much likelihood of your SIMMs becoming expensive trash in the immediate future.

CHRIS: As much as Apple would twitch in ecstasy if all users exchanged their old Macs once a year for the latest models, it just doesn't happen. People will be upgrading older machines for years, and you should be able to find a buyer for your SIMMs by placing an ad in your local paper or at your neighborhood software outlet.

BOB: Or if you're bound and determined to squeeze those SIMMs into your new system's DIMM sockets, you can try DIMM Tree, from Newer Technologies (800-678-3726 or 316-685-4904). Insert two same-sized (say, 4-MB) SIMMs into a DIMM Tree (see figure 1) to create an 8-MB pseudo-DIMM that can be installed in any Mac that uses DIMMs.

CHRIS: SIMM Savers (800-636-7281 or 316-264-2244) and other companies offer similar adapter boards. Keep in mind that using one of these devices will probably void your warranty, because it will put your machine out of spec. If your system is still under warranty and you care about such things, check with your Apple dealer before installing such doodads.

BOB: By the way, what are you going to do with the Performa 636 when you get your new computer? If you're going to sell it anyway, consider selling it with 20 MB of RAM. You'll get much more for it, and it will be more useful to the buyer. You can use the extra dough to buy DIMMs for your new system.

Checkered Chinese Dictionary

Q. Ever since I installed Nisus Writer with Language Key, I've been having font problems — my Chinese characters have turned into dingbats. I use Ed Lai's Traditional Chinese Dictionary (a HyperCard stack found at ftp.apple.com/pub/lai), and now the card in the stack that's supposed to contain the Chinese radicals (214 basic roots for all Chinese characters) is displaying dingbats instead of the radicals. What's happened?

Dan Lusthaus
via the Internet

TIP / PageMaker

Repairing Damaged Publications

When a PageMaker publication becomes damaged, it may generate an error message or display unexpected behavior. Here's how to diagnose and troubleshoot damaged publications:

If you can open the file, perform a diagnostic recompose, by pressing Option-Shift and choosing Hyphenation from the Type menu. A beep in response means that the publication is undamaged. Two beeps indicates that problems were found and fixed. Three beeps means that problems were found but not corrected.

To attempt a repair, try one or more of the following:

- Run the PageMaker "slide show," by pressing Shift and selecting Go to Page from the Layout menu. Once PageMaker has cycled through the publication once, press any key to stop it.
- Choose Links from the File menu, and unlink any files that appear with a question mark. Then use the Save As command, giving the copy of your publication a new name.
- If the above methods fail, you can at least retrieve your publication's text: Export the text, and place it in a new publication, by using PageMaker's Story Import filter to place the publication's text into a new file.

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CIRCLE **25** ON READER SERVICE CARD

CHRIS: Normally, this would be dead simple. Care to lay the groundwork, Bob?

BOB: Sure. Dan has a font-ID conflict. The Dingbats font installed by Nisus Writer has the same ID number used by Lai's Radicals font. When you open the dictionary stack, Dan, Dingbats is substituted for Radicals. To correct the problem, you should drag the suspect fonts from the Fonts folder onto the desktop and then onto the closed System Folder. System 7 automatically renumbers fonts when there's an ID conflict. If you're not sure which fonts are conflicting, you can download a copy of Rio Sabadicci's awesome font utility, Font Box (see end of article for info). It will, after the payment of a modest fee, neatly organize your fonts and resolve nearly every font conflict known to humanity.

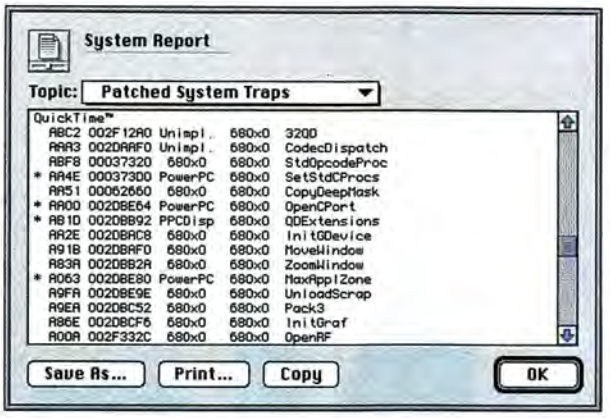

figure 2 / Learn how Power Mac-friendly your control panels and extensions really are, using Conflict Catcher. Asterisks mark the potential slowdowns.

CHRIS: *Normally* is the key word. In this special case, neither of these solutions will work. Here's why: HyperCard stacks can contain several resources: PICT images, sounds, and (surprise, surprise!) fonts. The Radicals font, in this case, is contained in the HyperCard stack, not the Fonts folder. Since the font isn't in the Fonts folder, there's no way for System 7 to resolve the font-ID conflict. The conflict arises only when the Traditional Chinese Dictionary stack is opened. And because placing font resources in HyperCard stacks is so unusual, Font Box doesn't know to look for them there.

Here are a couple of workarounds. Use a utility such as Symantec's Suitcase to create a specific set of fonts to be used with Traditional Chinese Dictionary — naturally this suitcase excludes Nisus' Dingbats. Or, using Apple's ResEdit, change the ID number of the Nisus Dingbats font so that it doesn't conflict. Keep in mind that font-ID numbers below 1024 are reserved by Apple, so they shouldn't be used.

BOB: Of course, the usual ResEdit warnings apply — always make a copy of the file in question, and put the original in a safe place before you begin work on the copy.

Conflicts of Interest

Q. I've heard there's a utility that can identify which extensions and control panels are not PowerPC-native. This, I am told, can help you spot performance bottlenecks and perhaps avoid the dreaded System Error Type 11.

Lance Thornswood
Los Altos, CA

BOB: You heard right. The remarkable Conflict Catcher provides a list of extensions and control panels that could be slowing your Mac.

CHRIS: Lance, if you were a serious propellerhead, you'd eat up our long-winded and arcane discussion of native and non-native traps and patches, but I suspect you're looking for a simpler answer. Slip it to him, Bob.

BOB: Just ask Conflict Catcher to generate a system report, and pull down the Topic menu to check for patched system traps. If you see many asterisked items, you know that this control panel or extension contains elements that could slow down your Mac. If it's an extension or control panel you can't live without, you're out of luck. If you don't need it, consider disabling it.

CHRIS: Although I'm also completely enraptured by Conflict Catcher, there's a shareware alternative that deserves a nod: Alessandro Levi Montalcini's cool PowerPCheck 2.0 is a drag-and-drop utility that looks for PowerPC-native code inside applications, control panels, extensions, and all other executable files. PowerPCheck can examine files as well as folders and entire disks and creates a detailed text report on all the native code it finds.

Although the $5 PowerPCheck doesn't provide the myriad features of Conflict Catcher, it's cheap, cheap, cheap.

Empty-Folder Inferno

Q. How do I get rid of an empty folder when my Mac won't let me? I can throw it away, but then I can't empty the Trash.

Charles Auerbach
Placitas, NM

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CIRCLE **3** ON READER SERVICE CARD

BOB: There are a couple of things you can try. First, restart while holding down the Shift key, to keep extensions and control panels from loading. When the desktop appears, hold down the Option key and choose Empty Trash from the Special menu.

CHRIS: We'll label this little jewel the Folder from a Temperate Zone. Truly hellish folders maniacally cackle at these weak efforts.

BOB: If that didn't work, try booting from a floppy disk. The Disk Tools disk, which comes with the majority of Macs, makes a dandy startup disk. After booting up, try emptying your Trash.

CHRIS: Folders responding positively to this treatment can be termed Purgatory Folders. Annoying, but in a dull sort of way.

BOB: If you still haven't been able to get rid of that pesky folder, it's time to take a closer look at your hard disk itself. Something on it may be wonky. First run Apple's Disk First Aid (which you can find on the aforementioned Disk Tools disk), click on the Repair button, and see if it detects any damage. If Disk First Aid can't fix whatever damage it finds, a third-party disk utility, such as Norton Utilities or MacTools Pro, may be able to do it. It's not a bad idea to run either or both of those two programs anyway.

CHRIS: Ah, now we're getting into the hot stuff. Bob's concern is valid and you *should* check your hard disk, but if you first want to match wits with this demonic icon, try this:

Drag the fiery folder from the Trash onto your desktop. Create a new folder somewhere else on your hard disk. Give it the same name as the untrashable folder, and drag this new folder to the desktop. When asked if you wish to replace the old folder with the new one, nod your head vigorously, say two Hail Marys, and click on OK.

If you've led an unblemished life (or are really, really sorry for the one you have led), the replacement folder should politely vanish after being trashed.

BOB: If you're still unable to get rid of that pesky booger, try HellFolderFix, a freeware utility by John Jeppson, available in all the usual places (see end of article). Back up your hard disk before you run it, as it writes directly to the disk and could conceivably destroy your data. If HellFolderFix doesn't work, throw in the towel, reformat the disk, and then restore it from the backup you just made. That's almost certain to do the trick.

figure 3 / YoYo won't "walk the dog" or "rock the baby," but it will use Caller ID and forwarding to manage phone calls from your Mac.

Forwarding March

Q. I want to direct incoming calls to another phone. Can I do it with my Mac?

Jerry Beck
via the Internet

CHRIS: Goody, goody, goody! I *love* these gadget questions!

BOB: Oh no . . . . Before you get all worked up, couldn't we just tell him to buy a cellular phone?

CHRIS: Nope.

BOB: Or hire a phone service? There are lots of good phone services that forward calls.

CHRIS: No way! You know why?

BOB: [*Groan* . . .] Because that would be too easy.

CHRIS: *Exactamente!* Listen, Jerry, any idiot can buy a cell phone or hire a service to forward calls. But we're the kind of idiots who've spent a small fortune on our Macs, and by gum, if we can't use them to further complicate our lives, what kind of return are we getting on our investment? Care to start us off, Bob?

BOB: As for hardware, you must have a modem attached to your Mac and have call forwarding set up with your phone company. Now to software:

If you're not particularly concerned about expense, PhonePro ($349), from Cypress Research (800-515-8111 or 408-752-2700), can do the job. PhonePro lets you build telephony applications by linking on-screen modules that handle such chores as dialing and scheduling. In your case, throw together some scheduling and dialing modules, flip your Macintosh on in the morning, and you're on your way.

CHRIS: At the last Macworld Expo, I saw a cool gadget that may also help. And at $149, it's cheaper than PhonePro. It's called YoYo (see figure 3), and it's a hardware device that plugs into your phone line and into your Mac's ADB

You're Already Thinking About Upgrading To Something More Powerful.

TIPS / Networking

Slow Service

If people on your network regularly use file sharing and the network is running slowly, check to see that no one has activated the Calculate Folder Sizes option in the Views control panel. When a Mac with this option switched on mounts a remote volume, the host Mac must crawl through the necessary calculations and, in doing so, causes the network to slow down.

Bob Dreano
Virginia Beach, VA

Easy On

Apple's Menu Options extensions, as well as file aliases, provide a great way to quickly log onto servers on your network. But what if you're on the road with a PowerBook or using someone else's Mac at the office and want to quickly get to your favorite file servers?

Simply copy aliases of the servers to a floppy disk or to your PowerBook's hard disk. Now when you use a different Macintosh, the only thing you need to do is load the floppy and double-click on the aliased server icons. If you create the alias while you're connected to your office network via ARA, the alias will dial the office *and* log you into a file server with nothing more than a double-click.

William Webb
McKinleyville, CA

Checking Up on Retrospect

Do you have a server on your network, running unattended backups with Retrospect? Here's a handy way for a conscientious network administrator to remotely observe the server's backup log.

Make an alias of the Retrospect log file on the server — this file is located in the Retrospect folder within the Preferences folder of the server. Give each log alias a unique name if you have more than one server.

If you have Retrospect on your Mac, double-clicking on the alias will cause Retrospect to open the remote backup-log file. Without that application, you can open the log file with SimpleText or any word processor. In either case, you'll need to have access privileges for the backup server in order to read the remote file.

Matthew W. Wilkinson
Evanston, IL

port. Like PhonePro, it can manage your phone calls. It's a lot simpler, though, and not designed to let you write sophisticated forwarding applications. When this descendant of Duncan gets an incoming call, it can route the call to a number you've specified. If your state allows — and if you've purchased Caller ID — you can have YoYo check the number of the incoming call and route it accordingly. In other words, you can program it to have calls from your mom's number forwarded to you. On the other hand, if it's an old lover pestering you for the whereabouts of a certain coffee table that really was yours in the first place and who the heck does she think she is, demanding the table after throwing away your prized velvet painting of Jimi Hendrix and....

BOB: Ahem.

CHRIS: Sorry. Suffice it to say, the old lover's call can be transferred to the pay phone on the corner (and it serves her right!). To set up multiple forwards, you'll need to use a macro utility to change YoYo's setting throughout the day. YoYo is available from Big Island Communications (408-342-8300).

Faster After Upgrading

Q. When I start up my Macintosh, I get a message that says, "Adobe Type Manager will run much faster if you install a Power Mac version." But I don't usually use Adobe Type Manager. Is there a way to delete this continual advertisement?

WMCF
via America Online

BOB: It's telling you that for peak performance, Adobe Type Manager, also known as ATM, needs an upgrade to the current PowerPC-native version (3.9 at the time I wrote this, for those of you keeping score). Upgrades from any previous version are available from Adobe and will set you back $29.95.

CHRIS: ATM is the little dingus — a control panel if you want to be picky about it — that makes Type 1 PostScript fonts at any size look clear and luxurious on your screen, or on paper when you use a non-PostScript printer. If you use PostScript fonts, you probably want to upgrade to the latest (read: faster-on-a-Power-Mac) version.

BOB: If you don't use PostScript fonts, feel free to joyfully chuck the ATM control panel into the Trash.

CHRIS: If you're not sure whether or not you use PostScript fonts, move the ATM control panel out of the Control Panels folder and onto the desktop, and then restart your Mac. Open a word processor, and type a few words. Select those words, and change them to an odd point size such as 15 or 21 points. If the letters look jaggy, you have PostScript fonts. If they look smooth, your fonts are of the TrueType variety. If you use TrueType exclusively and don't plan to bung any PostScript fonts into your system (or you really like that jagged look), you can trash ATM.

School of Hard Locks

Q. The administration at the school I work for wants to use separate software at each grade level — it doesn't want kindergartners playing with third-grade software, for instance. However, both grades sometimes use the same, non-networked Macs. Is there some inexpensive way I can disable an application for one group and enable it for another, without removing and reinstalling it?

Doug Pinkerton
via the Internet

CHRIS: A man after my own heart (and wallet)! As long as you use hard-disk-formatting software that lets you password-protect volumes (Hard Disk ToolKit, Silverlining, and Drive7 all have this feature), it's simple.

Create password-protected partitions on each of your school's Macs. Load the third-graders' software on one partition and the kindergartners' software on another. When it's time for the third-graders to start, mount their volumes, type in the password, lead the flag salute, and begin the class. When the eight-year-olds stampede out of the room, unmount the third-grade volume, mount the partition for the tiny kids, and pass out the graham crackers and milk.

You can use a macro utility to set the Macs up to do these chores automatically each day.

BOB: For those precious few schools that are rolling in dough, Power On Software's On Guard is an option. At $99 a copy (site licenses are available), it's not cheap, but it has loads of security options that are perfect for schools. Check out the online demo in all.the usual places.

Bob LeVitus is director of evangelism for Power Computing. Christopher Breen recently coauthored The Macintosh Bible Guide to Games, *published by Peachpit Press.*

You can find the shareware and freeware programs referenced in this article on *MacUser*'s Web page (http://www.zdnet.com/macuser). You can also find them in the MacUser and ZD Net/Mac areas on CompuServe. See How to Reach Us for instructions on accessing ZD Net/Mac.

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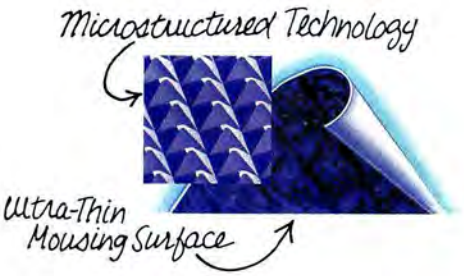

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CIRCLE **10** ON READER SERVICE CARD

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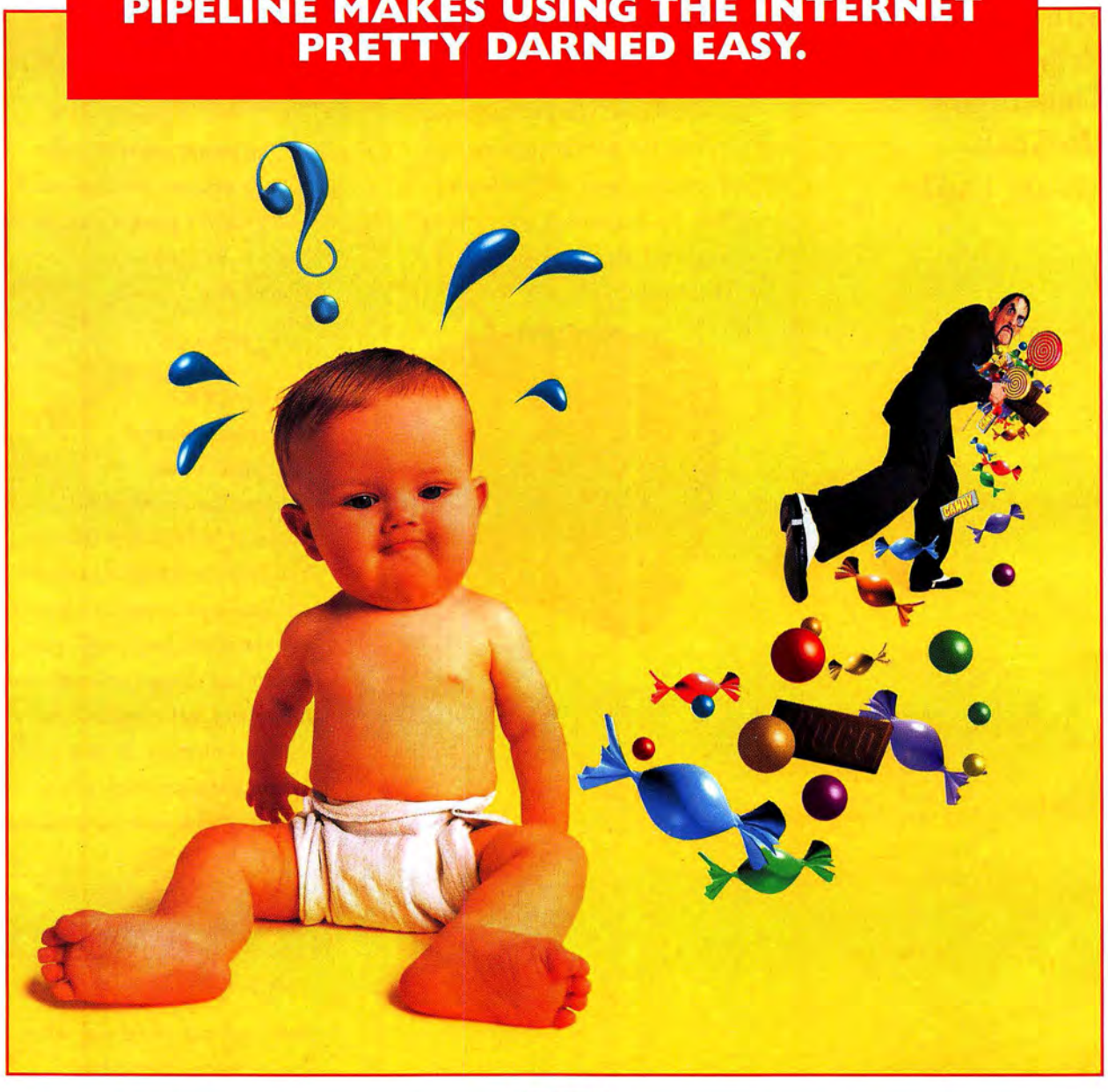

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CIRCLE **100** ON READER SERVICE CARD

If you need a little help getting your house and garden in shape, a CD-ROM may offer just that — a *little* help.

By Carolyn Bickford

Mouse and Garden

AS VIRGIN HOMEOWNERS, my husband and I had braced ourselves for the big mortgage payments, but we weren't anticipating the cranky dishwasher, the eccentric electrical wiring in the garage, and the cantankerous rosebushes. Now I spend less time exploring the mazes of Marathon than I do prowling the aisles of the local Home Depot store. And when I do find the leisure time to spend in front of my Mac, I'm often there just to check out the latest home-improvement- and gardening-oriented CD-ROMs — hoping to find some that will provide true added value over the many existing books on these topics.

Household Help

Home Improvement 1-2-3, a book written by experts from Home Depot, has fabulous step-by-step illustrated instructions that deftly guided my husband through each aspect of building a music studio in what used to be our garage. The **Home Improvement 1-2-3** CD-ROM ▼ (🍎🍎½; $50 estimated street), from Multicom (800-850-7272 or 206-622-5530), is disappointingly awkward in comparison. Each of the 12 main chapters, with headings such as Plumbing and Electrical, contains several more-specific topics, such as Repairing Wallboard. Each topic, in turn, includes a few projects, using the excellent step-by-step instructions from the book. But you have to click through the steps one at a time, plus click on buttons along the side of the screen for other pertinent information — for instance, how long a project will take and what tools and materials you'll need. The result is a confusing series of disjointed images. If you print the project, you see all the illustrated steps on a single page, but that's just another sign that such information is delivered best on paper. The "instructional video" the CD-ROM brags about — which might have made the book's information work on-screen — is nothing more than talking-head introductions to each chapter.

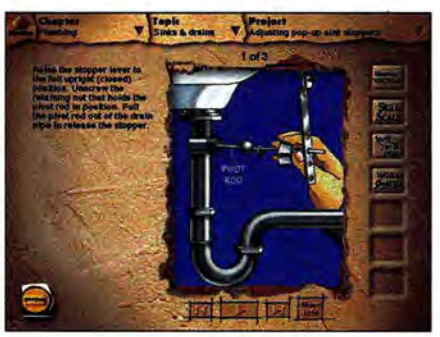

ILLUSTRATION / VICTOR GAD

If the main thing you want is good video, turn to **HomeTime Weekend Home Projects** (🍎🍎½; $39.95 list), from IVI Publishing (800-432-1332 or 612-996-6000). It features video clips taken directly from *HomeTime,* the PBS home-improvement show. In video clips for a variety of projects, such as installing a prehung door, the hosts helpfully alert you to details you might miss. Twelve general topics, such as Flooring and Tools, each include four or five video clips as well as text information you can access via buttons on the screen. That's still not a whole lot of information, though, and finding what you need can be a task in itself. For example, the topic Replacing an Old Light Switch is buried within a bunch of illustrated text you access by clicking on Tips buttons — and there's no index to get you there quickly. Another problem is stability: Although the program worked flawlessly on my Quadra, it froze frequently on all the Power Macs I tried it on.

Home Repair Encyclopedia (🍎🍎🍎; $20 estimated street), from Books That Work (800-242-4526 or 415-326-4280), sticks to text paired with an illustration or simple animation. The information, despite being extremely basic, is generally sufficient for the type of repair jobs covered, such as replacing a roof shingle. A main menu has chapter headings for a variety of topics, including not only home-maintenance and -repair tasks but also tips for dealing with emergencies and hiring a contractor. Within the topic windows, links and buttons let you move to other topics easily.

All the home-improvement CD-ROMs have built-in calculators that let you figure out how much material you'll need for a project. Home Improvement 1-2-3 has the most-thorough calculators, whereas those in HomeTime Weekend Home Projects are so basic they're almost worthless; for example, one Home Improvement 1-2-3 calculator makes you consider waste and actual per-roll coverage when you're estimating how many rolls of wallpaper you need, but an analogous calculator in Weekend Home Projects only multiplies the height of a room by its width. Home Repair Encyclopedia has only three calculators — for figuring out paint and concrete amounts and attic-vent size — but all three are complete and practical.

Advice by the Yard

The eccentricities of my house are nothing compared to those of my garden, which consists mostly of rosebushes — each with its own personality and preferences. I figured I could use some gardening software to help me pick a few other appropriate plants to add.

The **Better Homes & Gardens Complete Guide to Gardening** CD-ROM ▲ (★★★; $40 estimated street), from Multicom, sticks to being anecdotal and entertaining, and its handful of videos is useful. But getting exactly the information you want is like trying to find a four-leaf clover in an acre of overgrown lawn. The Gardening Index is particularly frustrating, because you have to know the correct classification (out of 12, represented by icons) for a plant before you can search for it. I pulled up lists of vines, perennials, annuals, fruits, and vegetables in my search for information about the chayote plant my mother gave me, to no avail. Further, although the Complete Guide to Gardening tries to cover all 50 states in the U.S., it errs on the side of generalization. For instance, the Gardening Fundamentals section tells you to consider which of 11 basic climate zones you're in, but all the other sections assume you're in a temperate climate or give you only two climate choices: cold and warm.

I had no trouble finding all the information I needed on chayote in **Western Garden** (★★★½; $49.95 list), from Sunset New Media (800-634-3095 or 415-321-3600) — but then it does have the advantage of limiting itself to flora for the 11 westernmost continental states. Like the book it's based on, Sunset's *Western Garden Book*, Western Garden is basically an encyclopedia of plants; each is represented with a picture plus climate and growing information. However, unlike most of the other products reviewed here, Western Garden takes intelligent advantage of its CD-ROM format: You can search for a plant by name, and you use your ZIP code to find out which of Sunset's 24 western garden zones you're in. You can limit yourself to viewing only the plants that can grow in your zone and that fit particular type criteria (say, shrubs) and sun and water requirements.

The Gardener's Friend (★; $29 estimated street), from Crystonix Software (800-272-9350 or 408-272-9343), is disk-based rather than on a CD-ROM, and it's meant to accompany, not replace, a gardening book. Like the CD-ROM programs, it can create a list of appropriate plants by your soil type, climate zone (one of 11 national zones), amount of light, and other factors. Unfortunately, The Gardener's Friend has serious interface problems that make it almost unusable. For example, there's no Quit command; to quit the program, you must return to the main screen and click on the Exit button.

Back to Plan A

If I planned to start a whole new garden or do some landscaping, I might splurge on Western Garden. But in general I'll stick with the *Home Improvement 1-2-3* book and a few good tools for my home, and I'll rely on my family's and neighbors' advice for my garden. After all, any software will keep me in front of my Mac when I've got repairs and gardening to do.

The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

JIM: Math is a lot like tofu.

RIK: Unpalatable but good for you?

JIM: More like, if you don't enjoy it, you can't understand why anyone does.

RIK: One difference is that although kids may have a choice about bean curd, they *have* to ingest math — which may be why most math software spices things up with games, activities, and snazzy graphics.

JIM: Or — in the case of this month's roundup — with planting, punting, munching, and bowling. ◀ **Peter Rabbit's Math Garden,** from Mindscape, takes the "planting" tack.

RIK: Right: Solve problems in the four math activities, and earn radishes to trade with Peter for plant seeds.

JIM: Young kids will love the Beatrix Potter graphics, but older ones may find the games repetitive.

RIK: Give the older kids the nifty **NFL Math,** from Sanctuary Woods, which combines math with football strategy and trivia.

JIM: The 3-D animated plays are cool, but how much math gets done?

RIK: Enough. If you want to keep playing, you'll keep solving problems.

JIM: Maybe it's just the perennial fumbler in me, but I prefer the arcade-game style of MECC's **Math Munchers Deluxe** ▶.

RIK: Not me. It may serve up a steady diet of math, but the eat-the-right-answers-and-dodge-the-nasty-Troggles game gets tedious fast.

JIM: Video-game lovers won't mind, and parents can tailor questions for kids' specific needs.

RIK: These games, which motivate kids to practice their fundamentals, all beg the question: Isn't there more to learning math than repetitive drills?

JIM: Here comes another Two Dads plug for exploratory learning and for our all-time math-software favorite: Brøderbund's **Math Workshop.**

RIK: Yup. Although the bowling gorilla does drill basic arithmetic, there's so much more.

JIM: Such as activities that slyly — and enjoyably — develop the skills on which math is based: logic, reasoning, geometry, and parts-to-whole relationships.

RIK: In sum, it's still the prime operator.

Math Munchers Deluxe ★★★½

Ages: 8 – 12.
Price: $25 estimated street (CD-ROM).
Arcade-game fans will enjoy guiding Munchers to eat math-quiz answers while avoiding dangerous Troggles. Good parental-customization options.
Company: MECC, Minneapolis, MN; 800-685-6322 or 612-569-1500.
Reader Service: Circle #418.

NFL Math ★★★★

Ages: 8 – 12.
Price: $40 estimated street (CD-ROM or floppies).
Gridiron action and strategy plus 3-D animated plays provide a fun and flashy wrapper for a solid math-drill game.
Company: Sanctuary Woods, San Mateo, CA; 800-943-3664 or 415-286-6000.
Reader Service: Circle #420.

Math Workshop ★★★★½

Ages: 6 – 10.
Price: $40 estimated street (CD-ROM).
Seven modules develop sequential logic, spatial relations, and other basic concepts. Great QuickTime parents' guide.
Company: Brøderbund, Novato, CA; 800-521-6263 or 415-382-4740.
Reader Service: Circle #419.

Peter Rabbit's Math Garden ★★★½

Ages: 4 – 8.
Price: $35 estimated street (CD-ROM).
Graphics are charming and characters are gentle and supportive, but simple math games quickly get repetitive.
Company: Mindscape, Novato, CA; 800-234-3088 or 415-897-9900.
Reader Service: Circle #421.

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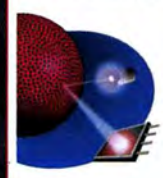

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The Game Room

BY BOB LEVITUS

FLAT IS OUT; 3-D is what it's all about. At least that's the idea behind this month's games. 3-D Ultra Pinball and Diamonds 3D bombard you with fast-moving balls that you wing into 3-D spaces. And Descent — this month's only shoot-'em-up — keeps you on the edge, in a battle craft that turns 360 degrees in any direction.

3-D Ultra Pinball

I hate to brag, but I must admit that even at the tender age of ten, I was making a profit from pinball games: One of my first entrepreneurial ventures was to sell to my friends the free replays I won on the pinball machines at Orchard Twin Bowl, in Skokie, Illinois. They each got two games for just one quarter, after I got through dominating a machine.

As an experienced player of pinball games on the Mac as well, I'd rate 3-D Ultra Pinball as, well, pretty good. Part of what makes it worth your gaming hours is that you get three playing fields in one: the industrial-looking Command Post Table, which is littered with black and yellow hazard stripes; the Mine Table, with rails for the ball to ride; and the Colony Table, with dome-shaped, futuristic-looking buildings. You can play any of the three tables separately, or you can play a combination game in which you warp from table to table when you complete a specific sequence of shots. Every so often, 3-D animations, such as exploding bulldozers and flying vehicles, appear as targets on the playing field. If you succeed in meeting five challenges on each table and acquire enough points, you can achieve the final goal — launching a spaceship.

Despite the creative graphics, the fact that you get three playing fields in one, and some whizzy effects, I still don't like this game as much as I do the state-of-the-art pinball simulations Loony Labyrinth, Crystal Caliburn, and Eight Ball Deluxe (all three created by LittleWing). The feel of 3-D Ultra Pinball — how balls roll and how bumpers bump, for instance — isn't as realistic, and the graphics aren't as crisp. But 3-D Ultra Pinball is a good fourth choice.

GAME POINT

Of Mac pinball games, 3-D Ultra Pinball isn't the most realistic-feeling, but it has some creative twists. You arcade fans will love Diamonds 3D, which has the same style of game play as the original Diamonds but with more-exciting graphics. If you have the horsies for it, get Descent — a rip-roaring, stomach-churning, way-fun ride.

3-D Ultra Pinball ★★★½
Price: $50 (estimated street).
Company: Sierra On-Line, Bellevue, WA; 800-757-7707 or 206-649-9800.
Reader Service: Circle #422.

Diamonds 3D ★★★★
Price: $30 (estimated street).
Company: MacSoft, Plymouth, MN; 800-229-2714 or 612-509-2125.
Reader Service: Circle #423.

Descent ★★★★½
Price: $50 (estimated street).
Company: MacPlay, Irvine, CA; 800-462-7529 or 714-553-3530.
Reader Service: Circle #424.

Diamonds 3D

Here's one more gem by the maker of Diamonds and More Diamonds. If you liked the addictive frenzy of those games, you're sure to get into this better-looking 3-D version.

Diamonds and Diamonds 3D are breakout-style arcade games, but in the 3-D version, the action takes place in a three-dimensional pit — something like a futuristic racquetball court. The object is to knock out bricks, one at a time, first hitting colored ones and then diamond-studded ones. Once you've cleared all the bricks, you move to the next of about 50 increasingly difficult levels. Sounds simple enough, but the ball can travel fast and its rate isn't constant. For instance, it builds up speed when it hits bricks close to your paddle (which remains on one plane). Besides trying to adjust to the speed and the angle of the ball coming at you, you have to meet some hidden challenges — such as changing the color of the ball before you can knock out certain bricks.

Diamonds 3D is the type of game you can come back to again and again when you need a quick gaming fix, since each level takes only a few minutes.

Descent

Warning: Descent is so realistic it causes motion sickness in some people. That said, don't miss this game — one of the best Mac games ever released.

To get an idea of what it's like to play Descent (pictured above), imagine equal parts Wing Commander III (a combat flight simulator) and Marathon II (a popular shoot-'em-up with impressive 3-D graphics) and toss in an aircraft that lets you turn up, down, or sideways at any time. I recommend using a joystick to fully enjoy the amount of control you get over your ship.

You pilot a heavily armed hovercraft through never ending tunnels in a dark, spooky mine on a planet far, far away. Your goal is to collect keys, munitions, and power-ups; rescue hostages; set off a reaction to blow up a mine; and get out before you blow up with it. To succeed, you have to face ever present enemies who have a creepy artificial intelligence — they adjust their attacks based on your behavior.

Descent has already gained a large following, which is partly due to how fun it is for multiple players to play over a Mac network or via modem. Up to eight players can connect over EtherTalk and up to three over LocalTalk.

The only drawbacks are that Descent requires a lot of Mac horsepower (you must have a Power Mac) and it's not as easy to learn as Doom or Marathon.

Bob LeVitus is a MacUser *contributing editor and Power Computing's director of evangelism.*

The Tip-Off

Descent Cheat Codes

To enable Descent's cheat codes, type in *gabbagabbahey.* Once you're in cheat mode, type in the following codes to get these results:

ahimsa = Enemy ships stop firing.
biopsytoys = Blows up reactor now.
guile = Cloak on or off.
twilight = Shields recharged.

You might need to change your keyboard settings so that typing a cheat code doesn't activate a game control. For instance, if you're using default control settings, typing a code that contains the letter *B* will cause a bomb to drop even if you don't want it to.

Note that using cheats makes your score drop to zero and that you can't use cheats in network play. For more codes, check out the Descent FAQ on the World Wide Web, at http://www.interplay.com:80/website/descent.faq.

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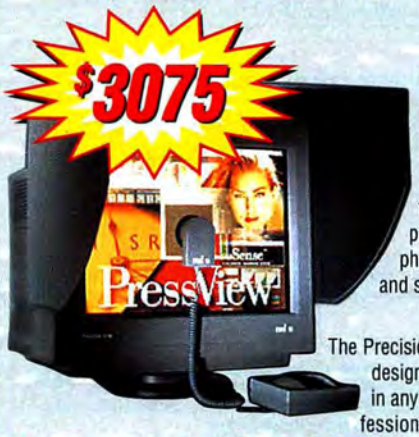

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PowerMac Memory Selection Guide

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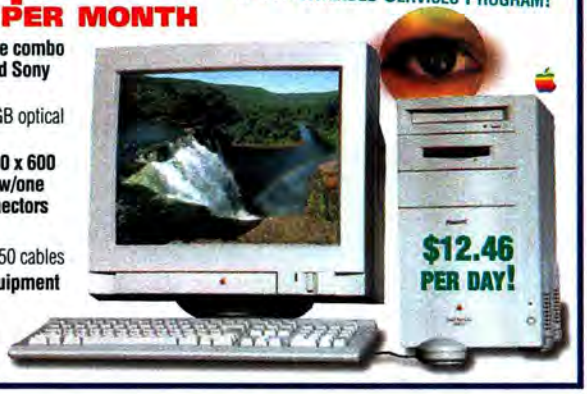

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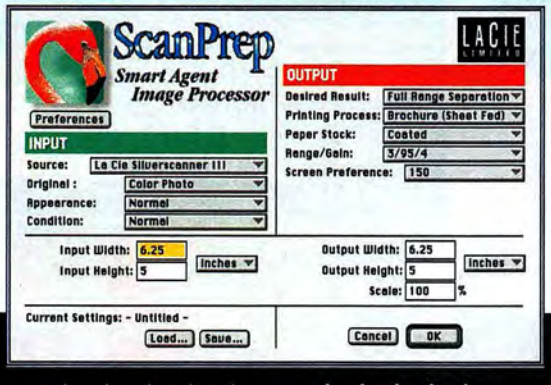

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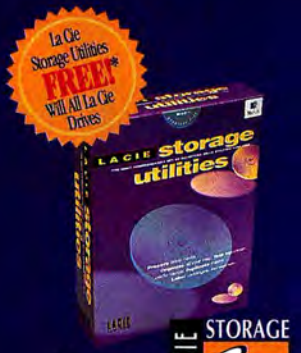

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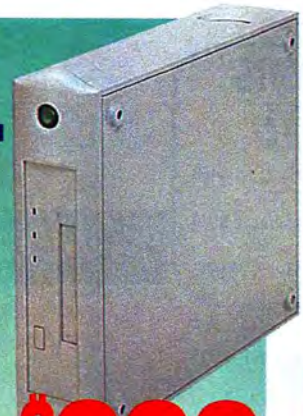

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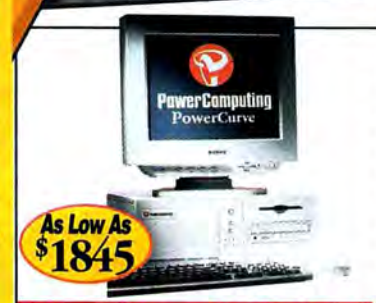

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APS Q 2.0 Quantum Atlas XP32150	2050MB LABS ★★★★	699.95	799.95
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APS MS 4.0 Micropolis 3243	4064MB LABS ★★★★	999.95	1099.95
Fast/Wide or AV available for an additional $100.00			
APS Q 4.0 Quantum Atlas XP3430	4101MB LABS ★★★★½ MacWEEK ★★★★	999.95	1099.95
Fast/Wide available for an additional $100.00			
APS MS 9.0 Micropolis 1991	8669MB	1899.95	2099.95
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Model	Capacity/Awards	Internal	SR2000
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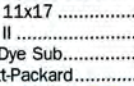

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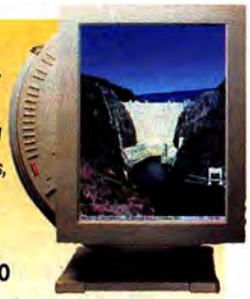

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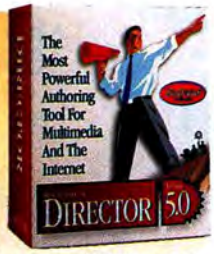

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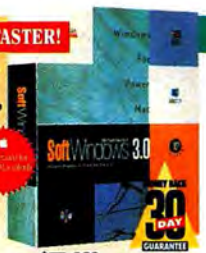

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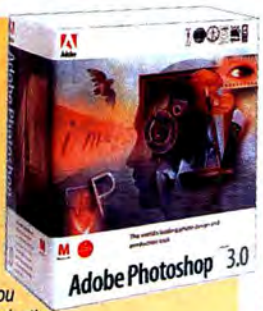

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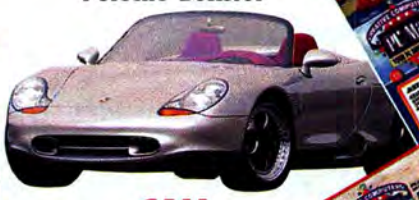

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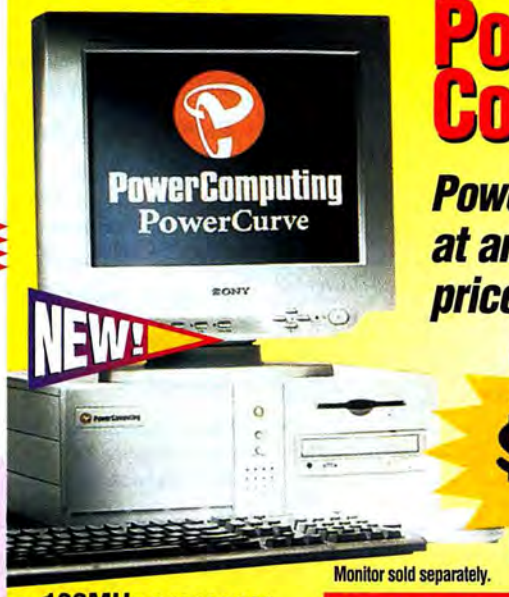

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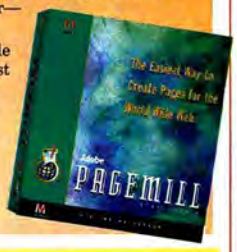

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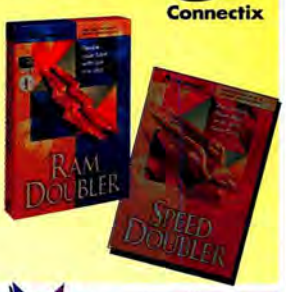

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1.0 GB	DT-1080FB	Quantum	11ms	3 yrs	$269	$344
1.05 GB	DT-51080	Seagate NEW PRODUCT!	10 ms	3 yrs	$269	$344
1.05 GB	DT-31230	Seagate NEW LOW PRICE!	9.0 ms	5 yrs	$355	$430
2.0 GB	DT-4221	Micropolis NEW LOW PRICE!	8.0 ms	5 yrs	$595	$670
2.0 GB	DT-2490	Hewlett Packard	9.0 ms	5 yrs	$899	$999
2.1 GB	DT-32550	Seagate Barracuda IILP	8.0 ms	5 yrs	$705	$780
4.3 GB	DT-3243	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$975	$1,050
4.3 GB	DT-15150	Seagate Barracuda NEW LOW PRICE!	8.0 ms	5 yrs	$1,199	$1,275
4.3 GB	DT-15230	Seagate Hawk 4 NEW PRODUCT!	9.0 ms	5 yrs	$899	$975
9.0 GB	DT-1991	Micropolis NEW LOW PRICE!	12 ms	5 yrs	$1,950	$2,050
9.0 GB	DT-410800	Seagate Elite 9 NEW LOW PRICE!	11 ms	5 yrs	$1,999	$2,099

AUDIO/VIDEO TUNED DRIVES

DIRECTTECH SYSTEMS IS AN AUTHORIZED A/V PARTNER WITH SEAGATE AND MICROPOLIS.

Capacity	Model No.	Mechanism	Seek	Warranty	Internal	PHASER-I
1.05 GB	DT-31230AV	Seagate	9 ms	5 yrs	$355	$430
2.0 GB	DT-4221AV	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$650	$725
2.1 GB	DT-32550AV	Seagate Barracuda	8.0 ms	5 yrs	$705	$780
4.3 GB	DT-3243AV	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$1,025	$1100
4.3 GB	DT-15150AV	Seagate Barracuda	8.0 ms	5 yrs	$1,199	$1,275
9.0 GB	DT-1991AV	Micropolis NEW LOW PRICE!	12 ms	5 yrs	$1999	$2,099
9.0 GB	DT-410800AV	Seagate Elite 9 NEW LOW PRICE!	11 ms	5 yrs	$1999	$2,099

FAST/WIDE SCSI DRIVES

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Capacity	Model No.	Mechanism	Warranty	Internal	PHASER-I
2.1 GB	DT-32550W	Seagate Barracuda 2LP Wide	5 yrs	$799	$899
2.1 GB	DT-4221W	Micropolis 4221Wide	5 yrs	$650	$750
4.3 GB	DT-15150W	Seagate Barracuda 4 Wide	5 yrs	$1,250	$1,350
4.3 GB	DT-3243W	Micropolis 3243Wide	5 yrs	$1,050	$1,150
9.0 GB	DT-1991W	Micropolis 1991Wide	5 yrs	$2,050	$CALL
9.0 GB	DT-1991AVW	Micropolis 1991AVWide	5 yrs	$2,100	$CALL
9.0 GB	DT-410800W	Seagate Elite 9 Wide	5 yrs	$2050	$CALL

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Capacity	Model No.	Mechanism	Seek	Warranty	EXTERNAL
4.0 GB	DT-32550W-2	Seagate - Fast/Wide Barracuda 2LP (2)	4.0 ms	5 yrs	$CALL
8.0 GB	DT-3243WAV	Micropolis - Fast/Wide 3243AV (2)	4.0 ms	5 yrs	$CALL
18.0 GB	DT-1991WAV	Micropolis - Fast/Wide 1991AV (2)	4.5 ms	5 yrs	$CALL

CALL FOR MORE INFORMATION ON DIRECTTECH DISK ARRAYS!

ATTO Silicon Express IV	Nubus Fast/Wide Accelerator	$CALL
ATTO Express PCI	Dual Channel - PCI -Fast/Wide	$CALL
ATTO Express PCI	Single Channel - PCI-Fast/Wide	$CALL

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Capacity	Model No.	Internal	PHASER-I
88 MB	SQ5110C	$299	$350
200 MB	SQ5200	$410	$460
270 MB	SQ3270	$410	$460

CD ROM RECORDABLE

JVC Personal Archiver (2X)	$1,165
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4-8 GB	Sony-5000	DDS-2	$999
4-8 GB	HP-1533A	DDS-2	$1,299
5-10 GB	Exabyte-8505	8mm	$2,199
15-30 GB	DLT-2000XT	DLT	$4,399

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Capacity	Model No.	Seek	PHASER-I
230 mb	Fujitsu	30 ms	$675
1.3 GB	HP-C1716	23 ms	$2,099
2.6 GB	Maxoptix	18 ms	$2,199

MEDIA

Type	Price
Syquest 44	$40
Syquest 88	$46
Syquest 105	$54
Syquest 200	$76
Syquest 270	$60
Optical 128 MB	$22
Optical 230 MB	$30
Optical 1.0 GB	$100
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1280MB	12ms	5400	128K	3yr	FB1280S	$279	$339
2150MB	8ms	7200	1024K	5yr	XP32150	$669	$729
4300MB	8.6ms	7200	512K	5yr	XP34300	$959	$1019

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105MB	$53	$50
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200MB	$67	$65
270MB	$55	$53

Capacity	Speed	Compatible	Model	Buffer	Internal	External
135MB	13.5ms	135MB	EZ135S	128K	n/a	$195
200MB	18ms	44,88,200MB	SQ5200C	64K	$339	$395
270MB	13.5ms	105, 270MB	SQ3270S	128K	$339	$395
1.3Gig	11ms	650MB, 1.3GB	SyJET	256K	$499	$599

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6X	NEC	$339
6.7X	Toshiba	$309

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2Gig	4mmDAT	HP	11MB/min	$789
2-4Gig	4mmDAT	HP	22MB/min	$919
4-8Gig	4mmDAT	HP	60MB/min	$1079
7-14Gig	8mmDAT	ExaByte	60MB/min	$2049

Brand	Capacity	Seek	RPM	Buffer	Wty	Model	Internal	External
Seagate	1052MB	9ms	5411	512K	5yr	ST31051N	$360	$420
Seagate	1080MB	12.5ms	5400	128K	3yr	ST51080N	$250	$310
Micropolis	2050MB	9ms	5400	512K	5yr	MC4421	$539	$599
Micropolis	2050MB	8.5ms	7200	512K	5yr	MC4221	$585	$645
Micropolis	2050MB	8.5ms	7200	512K	5yr	MC4221AV	$665	$725
Seagate	2147MB	9ms	5411	512K	5yr	ST32430N	$605	$665
Seagate	2147MB	8ms	7200	512K	5yr	ST32550N	$679	$739
Seagate	4290MB	9ms	5400	512K	5yr	ST15230N	$889	$969
Seagate	4290MB	8ms	7200	1024K	5yr	ST15150N	$1109	$1169
Micropolis	4294MB	8ms	7200	512K	5yr	MC3243	$979	$1039
Micropolis	4294MB	8ms	7200	512K	5yr	MC3243AV	$1059	$1119
Micropolis	9100MB	12ms	5400	512K	5yr	MC1991	$1899	$1999
Micropolis	9100MB	12ms	5400	512K	5yr	MC1991AV	$2029	$2129
Seagate	9080MB	11ms	5400	1024K	5yr	ST410800N	$1929	$2029

WIDE SCSI (WIDE SCSI controllers Adaptec PCI $289, Atto PCI $329, Atto Nubus $819 with WIDE SCSI drive purchase.)

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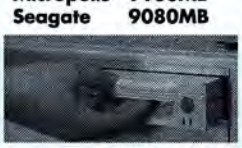
Micropolis	2050MB	8.5ms	7200	512K	5yr	MC4221WAV	$779	$889
Seagate	2147MB	8ms	7200	512K	5yr	ST32550W	$820	$920
Fujitsu	2176MB	9.5ms	7200	512K	5yr	M2915W	$619	$749
Seagate	4290MB	8ms	7200	1024K	5yr	ST15150W	$1209	$1329
Micropolis	4294MB	8ms	7200	512K	5yr	MC3243W	$1079	$1189
Micropolis	4294MB	8ms	7200	512K	5yr	MC3243WAV	$1139	$1269
Micropolis	9100MB	12ms	5400	512K	5yr	MC1991W	$2029	$2229
Micropolis	9100MB	12ms	5400	512K	5yr	MC1991WAV	$2129	$2329
Seagate	9080MB	11ms	5400	1024K	5yr	ST410800W	$2199	$2389



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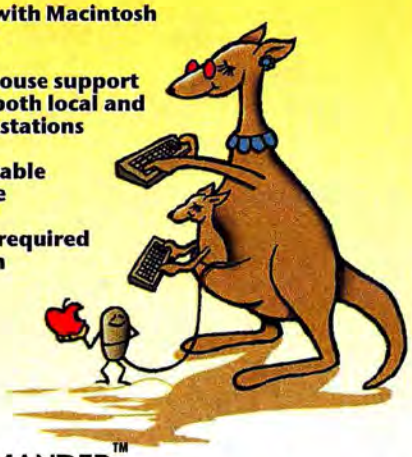

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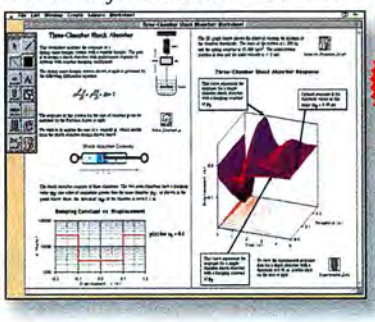

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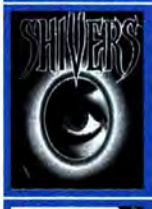

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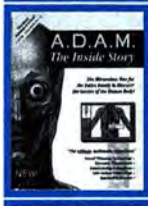

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MacUser

ANDY IHNATKO

Designs for Dreaming

I'VE BEEN ASKED for my reaction to the installation of Dr. Gil Amelio as Grand Poobah of Apple Computer. Well, first and foremost, I should say that his personal grooming and hygiene are absolutely beyond reproach, assets I think are sadly overlooked in this day and age. Also, I'm delighted to find that my favorite computer company is finally being led by a fellow with a name evocative of the villain in a cheesy 1954 sci-fi picture. Seeing as Dr. Colossus already has his own Internet startup in Boca Raton, Apple's board of directors could hardly have made a better choice.

That said, however, I'm a bit disappointed by one of his stated goals. Gil intends to narrow the product line and focus on core hardware. Is this really the best course of action? Come on, Gil! Do *you* want to go down in history as the man who took Apple, a company that came *this* close to marketing a business computer shaped like Huckleberry Hound (true), and turned it into just a manufacturer of really expensive off-white boxes?

Gil, I feel your pain. Oh sure, it's easy for me to sit here and write a column complaining about your Vision. I mean, seeing as I'm here on the back page now, it's practically a contractual thing. But hey, that's not my way: I just want to *help*. So hang your eyeballs on the following Breakthrough Concepts in Macintosh Design. Each of these is a surefire megahit guaranteed to pull Apple's fanny out of the red:

We all know that The Environment is one of the most critical issues a responsible corporation has to address when trying to manipulate the younger generation into forking over its dough, right? Enter The Earth Mac. First, it's made out of 100-percent-recycled material, being built completely from raw materials and chemicals that were already lying around labs and warehouses anyway (remember, every PowerPC 604 processor we put *into* a Mac is one less processor that winds up in a landfill). Second, it'll be the first computer that does *not* contribute to Gaia's pain through a scornful waste of electricity: The Earth Mac will be powered by diesel fuel or aviation-grade kerosene. Both are *renewable* resources *found in nature*. If you don't believe me, just check the wetlands behind a gas station or municipal airport . . . trust me, you'll find all the fuel there you could ever *want*.

Once you've used a Mac, you're hooked for life — we all know that. (Note to Bob, Linda, and Jeff: Look into signing Iggy Pop for a couple of ads?) As soon as you hit that power key and hear that thrilling chord, you just can't tear yourself away from the miracle of the Mac OS, which leads to missed meals and haggard, pale users (B, L, J: Iggy *and* Keith Richards in a series of commercials. Fax me.) To keep users from dying off and thus impacting market share, Apple should introduce yet another "Mac First" breakthrough engineering technology: Chia Mac, The Pottery Computer That Grows (codeveloped with Adobe. *Thank you! You've been a great audience!*). Fill the Pottery Mac with water and sprinkle the seeds, and — presto! — fresh greens any time you want (B, L, J: Plus a Super Bowl spot with Paul McCartney?). Through APDA, there should also be a model made available exclusively for programmers and Internet jockeys. No sunlight ever enters their offices, so some sort of temperature- and humidity-controlled drive bay for growing mushrooms is needed. (B, L, J: Maybe we can exploit some grunge band?)

I'd like to make *one* suggestion to Apple that isn't so much a brand-new design concept as a badly needed fix of an old problem. As fellow Mac users, I'm sure you all know what I'm about to suggest: the Mountain-Pine-Fresh Mac. I honestly don't know why Apple's let this problem slide for so long, but *every* Mac from at least the time *I've* owned 'em has given off this awful musty, ammonia, rotting-food-type stench. I don't know if it's coming from the CRT or if it's some resin that overheats, but it seems like everyone who visits my home or office complains about the odor. Stop stalling on this, Apple! Need I remind you that we all have *warranties?*

Finally, the most surefire design of them all. These are, of course, tough times for the Mac platform. The business community's confidence and faith in Apple are at a low ebb, and little by little, this sentiment is working its way down to the base of potential Mac buyers. The obvious solution is take each Mac in the product line and paint it yellow with a horizontal black zigzag stripe in the middle. For what, I ask you, exudes friendliness, reliability, decency, and honor like the sweater of Good Ol' Charlie Brown?

There you go; I've just handed Apple's salvation to you on a silver platter. *This Is Your Moment, Gil Amelio*. I have *faith* in you. But more than that, I and millions of fellow Macintosh users have faith in Apple. Specifically, we have faith that like one of your predecessors, you'll move into your office as a sensible and levelheaded scion of Industry and that after a few months of breathing that fine Cupertino air, you too will begin padding around the hallways in your bare feet, enthusiastically pitching stockholders on your $90,000,000 vision of kitchen appliances with QuickTime content.

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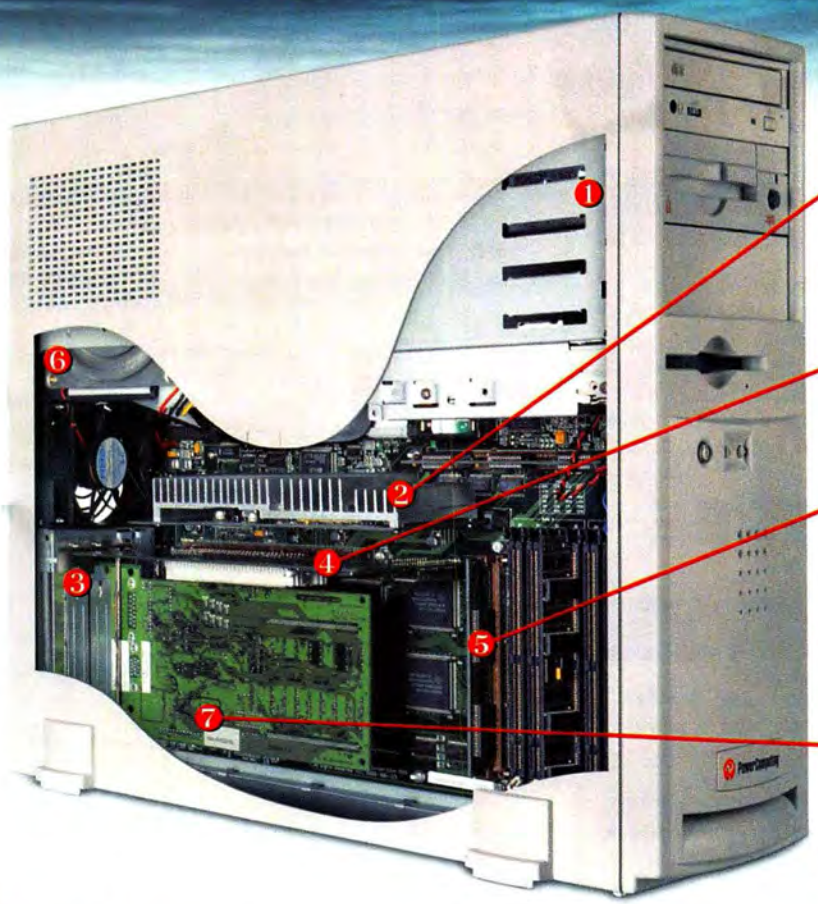

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