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WE'VE GOT GREAT REVIEWS, A FANTASTIC QUALITY AND A

***Actually, we can't blame it all on the poor guy in forecasting.**


We never expected our growth to exceed Dell, Compaq and Gateway's first years' sales combined.

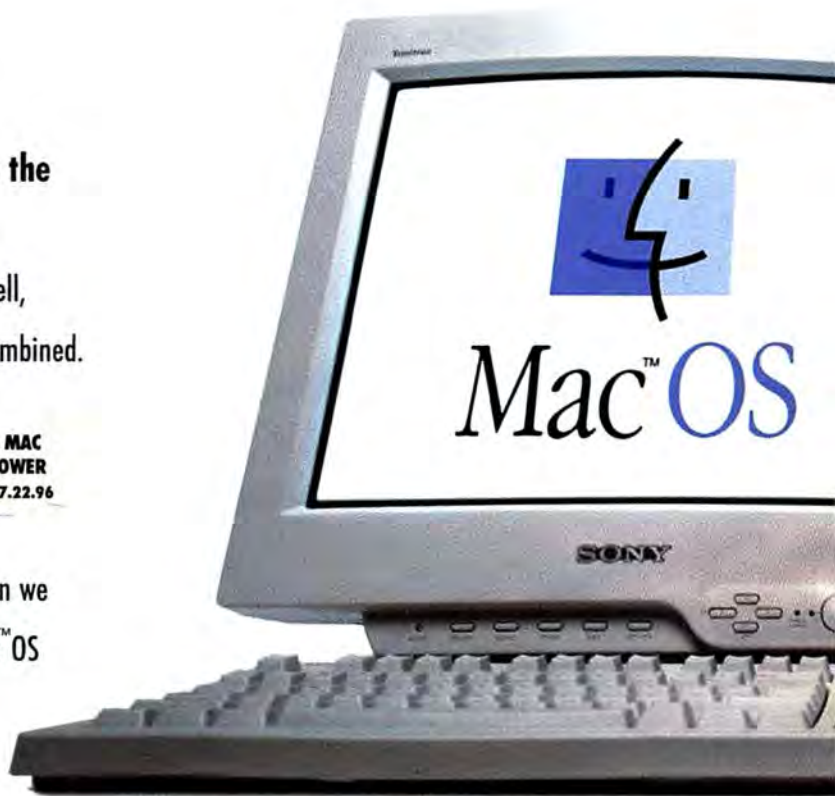
"THE POWERTOWER PRO SERIES SOARS ABOVE ALL MAC RIVALS....MAC POWERUSERS WILL SOON BECOME POWER COMPUTING USERS IN DROVES"— MacWEEK MAGAZINE 7.22.96

We knew we made great products, but when we started getting the best reviews of any Mac OS

 system in the industry and offered our systems at the lowest prices, our sales went through the roof.

We've had our share of growing pains, but we've worked hard to iron them out. And you'll see continued steady improvement over the next couple of months. For example, if you order a PowerCenter™ 150MHz or PowerTower™ Pro 225MHz direct from Power Computing you can expect to get

 your system custom configured and exactly the way you want it in a couple of weeks.



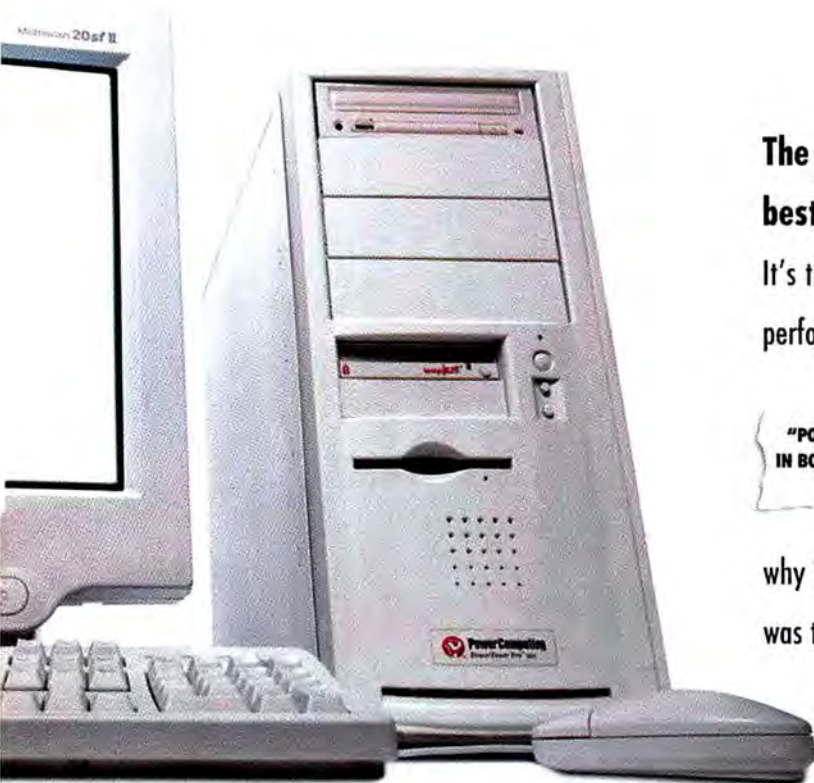
A PowerCenter 604/150 starting at around two grand is an awesome buy.

Especially when you start comparing features and price points to the other 150MHz Mac OS systems on the market. (While you're at it, why not compare it to machines in the PC market



"IF YOU REQUIRE MAXIMUM PERFORMANCE, NO CURRENT APPLE SYSTEM CAN TOUCH THE POWERTOWERS."
— MacWEEK MAGAZINE ♦♦♦♦

WESOME PRICES, KILLER SYSTEMS, BONEHEAD IN FORECASTING.*



The PowerTower Pro 225 is simply the best computer investment you can make.

It's the fastest, most expandable and highest-overall performing Mac OS system you can buy. That's probably

"POWER COMPUTING HAS THE CLEAR AND UNDISPUTED EDGE OVER APPLE IN BOTH PRICE & PERFORMANCE. YOU WANT A POWERTOWER PRO."


— MacUser MAGAZINE SEPT '96

why it received "Best of Show" at MacWorld Expo and was the first machine in over three years to

receive the coveted Five Mice from



MacUser magazine. (FYI: Our PowerBase™ line was the second).


Give Power Computing a call and let one of our sales consultants help you  custom configure your next system.

In the meantime, everyone at Power Computing sincerely thanks you for your continued patience and the overwhelming support. And whatever you do, never stop fighting back for the Mac.

and get a glimpse of why the Mac is making a comeback). Our PowerCenter has everything you need in a mid-range system, including the upgradeability you

◆◆◆◆ need to ensure that it won't be sitting in a MacWeek closet next to a IICX acting as a print server a year from now.

"POWER COMPUTING HAS FIELDIED SOME KILLER MACHINES. APPLE WILL BE HARD PRESSED TO CATCH-UP."

— MacUser MAGAZINE JULY, 1996 



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- Extended Keyboard and Mouse
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- 6 PCI Expansion Slots
- Interleaved Memory
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- 1MB Level 2 Cache
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- 2 MB VRAM On-Board (4 MB Max)
- 3 PCI Expansion Slots
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- 3 PCI Expansion Slots
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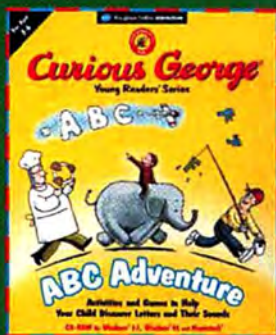
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Join everyone's favorite monkey as he takes your kids on a lively exploration of alphabet sounds, shapes and pronunciations, as well as playing letter games at the zoo. Curious George ABC Adventure is great for a head start on learning. From Houghton Mifflin Interactive.



This new interactive animated storybook from Living Books brings Dr. Seuss's most memorable characters to life, enabling your child to learn to love reading in an entirely new way. Green Eggs and Ham will help build your child's memory and observation skills and more.

Encarta 97 Encyclopedia is everything you'd expect from a multimedia encyclopedia. Rich with articles, photos, animation sequences, video clips and a dictionary containing over 65,000 words, this 2-CD-ROM program from Microsoft will teach your kids something new every day.



Westwood Studios' CD-ROM version of the MONOPOLY game will entertain you like never before. Rich Uncle Pennybags is your animated Master of Ceremonies as Depression-era Atlantic City comes to life with state-of-the-art 3-D graphics, animation and digital sound.



This holiday



With 4 practice tests and 300 of the most commonly tested words, Inside the SAT and ACT '97 Edition will have your kids mastering these tests and raising their scores faster than you can decide what to do with their rooms when they move out. From The Princeton Review.

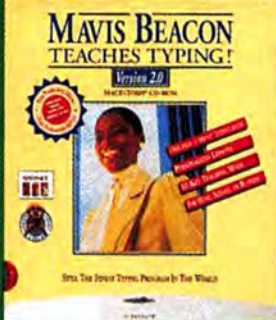
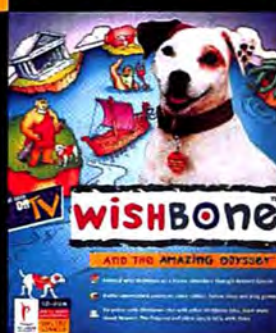


Tbeatrix brings you Hollywood High, the latest CD-ROM program in the Hollywood series. An animated multimedia program that lets you and your kids write and produce your own movies about your family, friends and favorite places. And people say getting into movies is hard!

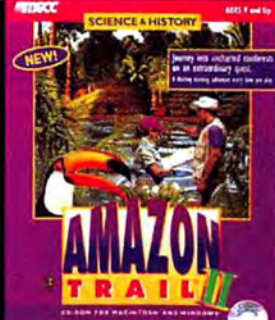
This learning program by GT Interactive is a great way for your kids to explore and discover. Follow along as Critter and his mom's journey to the Big Apple comes alive right before their eyes. Just Me and My Mom will have them playing again and again.



Wishbone™ and the Amazing Odyssey from Palladium Interactive features Wishbone™ in his first CD-ROM adventure. Wishbone™ has been zapped into the animated world of Homer's Odyssey and is trapped in the world of ancient Greece. He needs your help to get home.



Let Mavis Beacon show you the keys to success! With over 4 million copies in use, Mavis Beacon Teaches Typing is the world's best-selling typing program. It's the proven, effective way to learn and improve keyboard skills. From Mindscape, Inc.



Adventure lurks everywhere in Amazon Trail™ II. This interactive program from MECC will have your kids learning about the ecology and history of the Amazon. Interacting with explorers, scientists and indigenous people. And fending off hungry animals and reptiles.



Miracles never cease when you bring home software for your Macintosh® personal computer. And now the thousands of great education and entertainment titles available for the Mac® are as easy to choose as they are to use. You can pick them up at stores like CompUSA, Micro Center, Staples and Fry's Electronics while you're out doing your holiday

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season, wouldn't it be nice to hear the words "cool" and

"parent" used in the same sentence?



shopping. Or, sit back, relax and shop from home using one of the many Mac mail-order catalogs out there. Or, you can simply hop on the Internet and find them in cyberspace. However you choose to shop for them, remember to look for the smiling Mac OS logo. (All great software wears this face.) With all these options now available, becoming the neighborhood's most envied parent is as easy as using the Mac software your kids will love. To learn more about all the great titles for the Mac, as well as the convenient ways you can get them, visit www.macsoftware.apple.com. **Or call 800-500-4862.**

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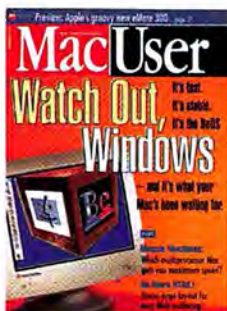
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On the cover / The BeOS: This new OS could be the Mac's next big thing.

Cover photo / Giampiero Benvenuti

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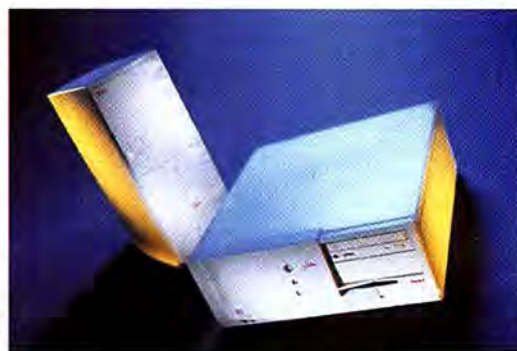
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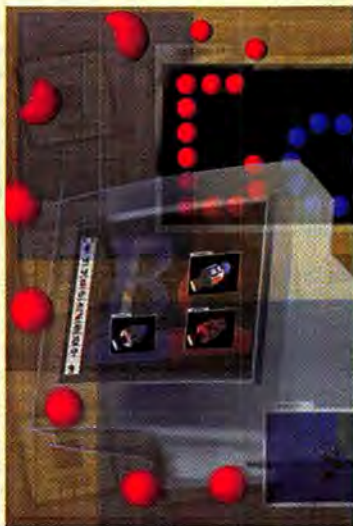
EXCLUSIVE REPORT

Plan Be

To Be, or Not to Be?



With the future of the Mac OS more in question than ever, can the Mac-friendly BeOS be everything we've been hoping for? MacUser Labs puts the BeOS to the test and suggests how Apple might take arms against its sea of troubles. By Henry Bortman and Jeff Pittelkau / 64

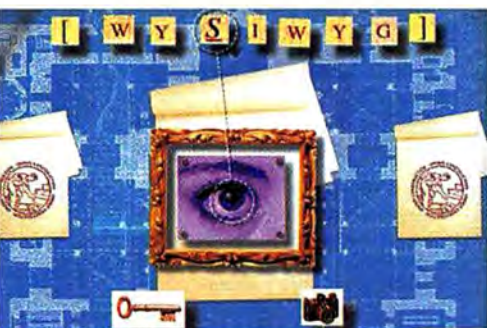


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Muscle Macs



DayStar's new pumped-up multiprocessor Mac OS systems make fast work of CPU-intensive multimedia applications. That's good news for digital artists and imaging pros. And the rest of us? MacUser Labs puts the new systems through their paces and checks out the state of applications that take advantage of multiple CPUs. By David Biedny and Nathan Moody / 76



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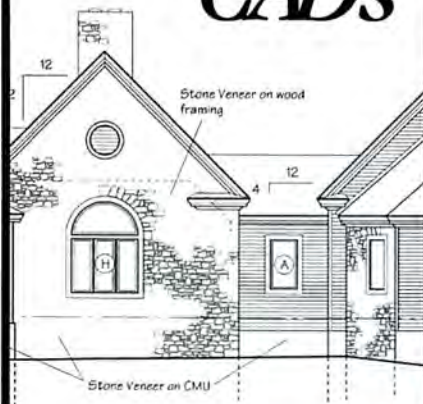
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—Bob Payne, Architect



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New OmniPage Pro 7.0 gives you the recognition you deserve.

OmniPage Limited Edition
or **OmniPage Lite**
is the OCR that came with your scanner. They give you basic OCR.

How to Improve Your OCR Accuracy and Save Big \$\$\$

Caere Corporation (NASDAQ: CAER) recently announced an upgrade that makes the OmniPage Pro optical character recognition (OCR) software available to scanner users for an estimated street price of only \$129. This upgrade is available to users of any of the major OCR products (including those bundled with flatbed and sheet-fed scanners) can upgrade to the full version of OmniPage Pro at a 60% discount.

OmniPage Pro has a separate upgrade package available through Computer City, Egghead, and Best Buy. Since the vast majority of Caere OCR, most scanner users are eligible to upgrade at this great price.

The large number of scanner manufacturers that bundle Caere OCR software with their products makes the upgrade program available to a wide range of users. The upgrade program includes OmniPage Pro 6.0 (Windows 3.1 and 7.0/Windows 95), which offers all the capabilities of the bundled software for extended functionality. Most notable among them are high-resolution "zoning" and preprocessing of scanned images, verification of the Page technology for the retention of the original page formatting, as well as OCR training and deferred processing capabilities.

The Changing OCR Market: In the not so distant past, OCR required expensive and difficult to use software that was often difficult to use and provided little or no support. These issues were frustrating and limited the use of OCR to high-volume applications. The use of desktop OCR was limited to the "early adopters."

"Today, several trends are contributing to the widespread use of OCR," said Chad Kinzelberg, Caere's vice president of marketing. "The first is the availability of OCR software that is easy to use and provides a high level of accuracy. The second is the availability of OCR software that is easy to use and provides a high level of accuracy. The third is the availability of OCR software that is easy to use and provides a high level of accuracy."

Analysts following the OCR market agree that OCR use is on the rise and that the industry trends promoting its mainstream adoption:

Higher Customer Awareness: An increased number of computer users are becoming aware of the time and money saving benefits it provides.

Higher Scanner Penetration: Scanners prices have dropped drastically in the last few years with many flatbed and sheet-fed scanners available for under \$500. Also, the use of small-footprint sheet-fed scanners and multifunction devices has entered the market.

Increased OCR Accuracy: OCR developers have developed high accuracy OCR technology for increased output. The greatest improvement has been made on degraded and hard to read documents.

Improve Your OCR Accuracy and Save Big \$\$\$



Higher Scanner Penetration:

Scanners prices have dropped drastically in the last few years with many flatbed and sheet-fed scanners available for under \$500. Also, attractive, new scanner form factors (such as the small-footprint sheet-fed scanner) and multifunction devices have entered the market.



Low cost scanners entering the market have helped push OCR use to a new level.

CR Market:

In the past, OCR required expensive and difficult to use software that was often difficult to use and provided little or no support. These issues were frustrating and limited the use of OCR to high-volume applications. The use of desktop OCR was limited to the "early adopters."

Increased OCR Accuracy:

OCR developers have developed high accuracy OCR technology for increased output. The greatest improvement has been made on degraded and hard to read documents.

Pricing and Availability:

OmniPage Pro 7.0 (Windows and Mac) and WordScan Plus 4.0 (Windows) upgrade packages are immediately available at major resellers for an estimated street price of \$129.

The Company:

Caere Corporation, with U.S. headquarters in Los Gatos, Calif. and European headquarters, Caere GmbH, in Munich, Germany, is a leader in OCR technology and desktop document management products. Caere has recently expanded its product line of OCR software.

continued on next page

OmniPage Pro gives you almost twice the OCR accuracy with the same ease-of-use as OmniPage Limited Edition.

OmniPage Pro keeps text in its original format and layout, including graphics.

OmniPage Pro even outputs to HTML.

OmniPage Limited Edition

OmniPage Pro

Upgrade now to faster, more accurate OCR.

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OmniPage Pro employs a new, more powerful OCR engine to recognize poor copies and degraded faxes.



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Key Feature Comparison	OmniPage Pro	OmniPage Limited Edition
Caere's fastest and most accurate OCR engine	✓	
AutoOCR Toolbar™ for easy, one-button OCR processing	✓	
Apple Guide gives you on-screen interactive help	✓	
Preserves graphics in output text	✓	
OCR from within your favorite applications	✓	✓
Retains original layout	✓	

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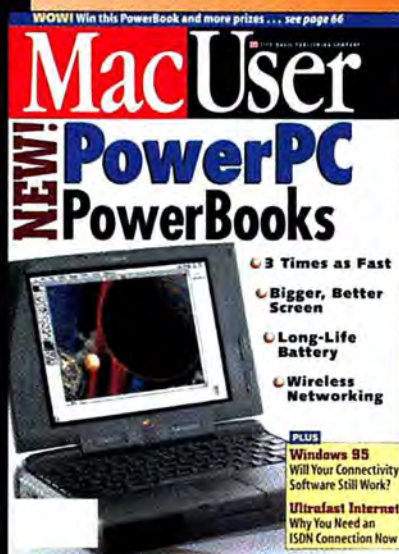


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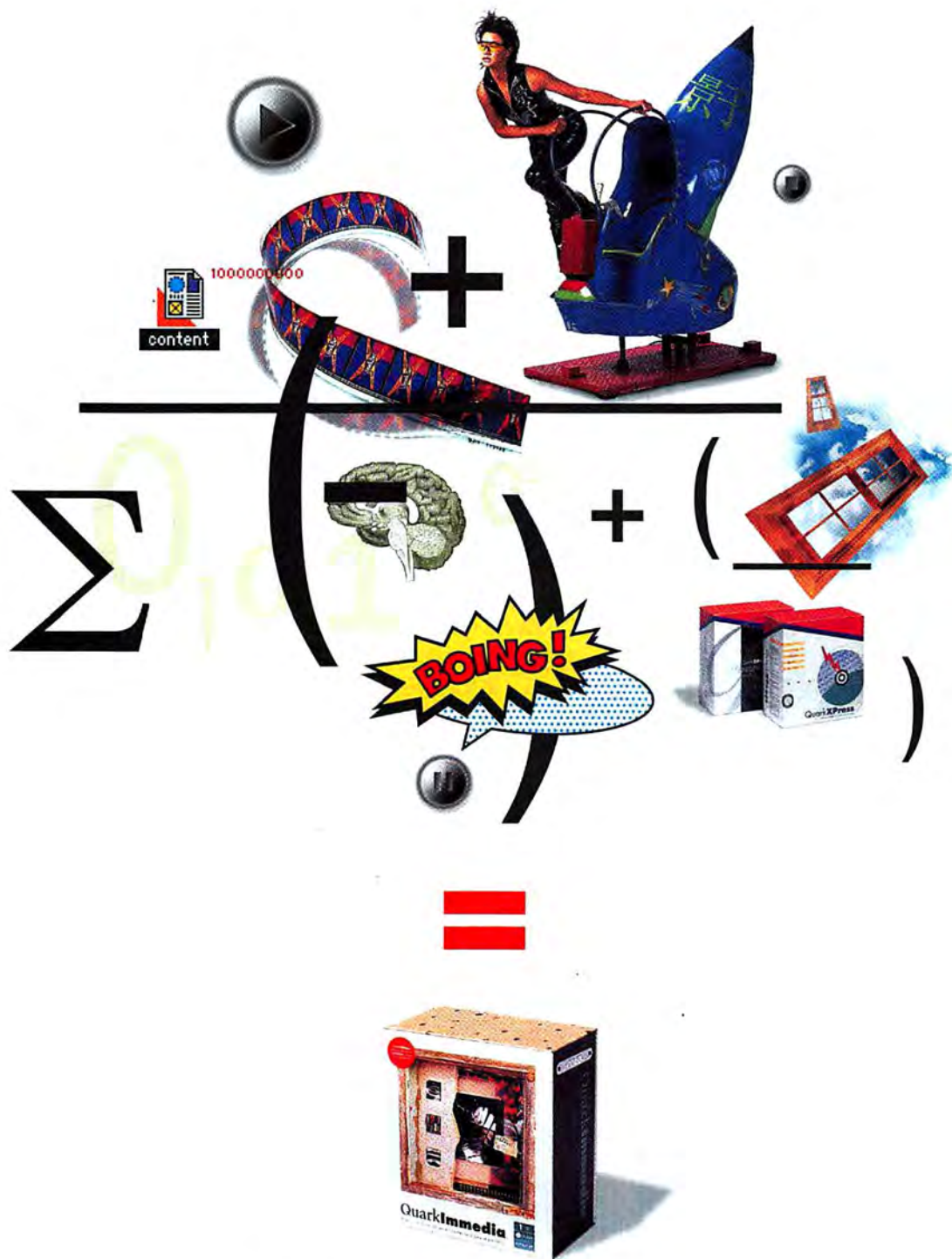
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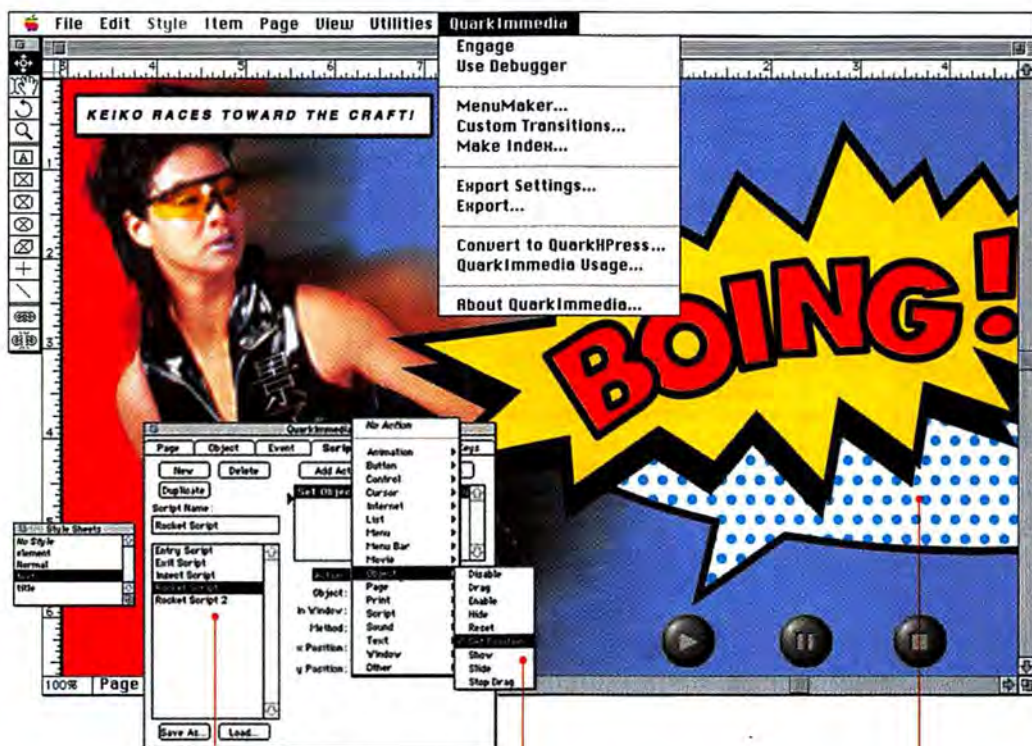
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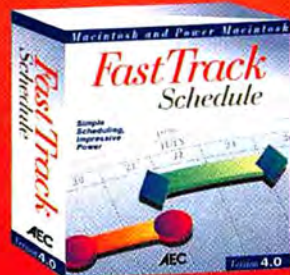
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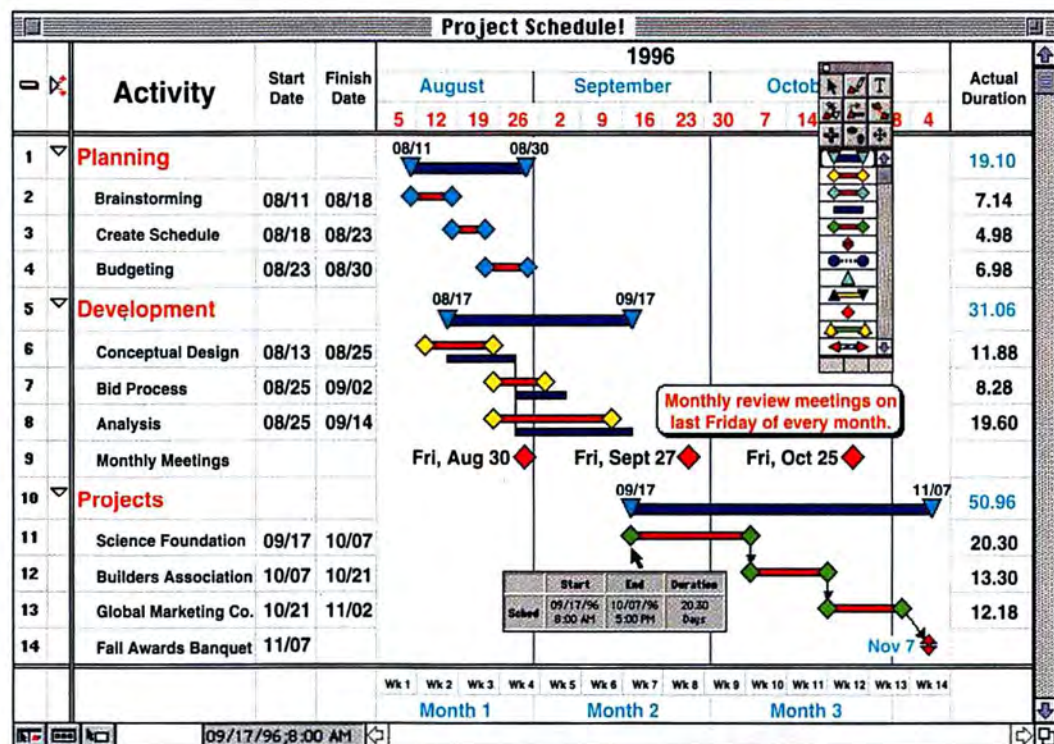


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LETTERS

Drawing Fire

KUDOS TO SHELLEY CRYAN for her well-researched and comprehensive article on the latest drawing packages for the Mac ("Drawing Conclusions," November '96, page 98). Her conclusions are right on target. One question designers/artists should consider before purchasing any of these packages: "What will I be using this drawing package for?" If it's just for fun, any package will do. However, if you want to take your artwork into the realm of four-color printing, stick with Illustrator or FreeHand. Many high-end prepress shops will actually refuse to accept or will charge double for projects submitted as or linked to CorelDRAW files, since such files are extremely difficult to color-separate and output correctly on industry-standard imagesetters. Hopefully, Corel will address these problems in future Mac/Windows releases. In the meantime, serious designers/artists should stick with PostScript drawing packages designed to work on the Mac.

Randy Omdahl
omdahl@mmsi.com

THE INTERFACE REDESIGN and feature set of Canvas 5 are very promising. But before seriously considering Canvas 5 a real player among FreeHand, Illustrator, PageMaker, QuarkXPress, and Photoshop, your reviewer should at least have tested the product beyond a cursory overview of the feature/interface set. Reliability, acceptance by service bureaus, and work-flow incorporability are make-it-or-break-it concerns for illustration and design professionals.

You're right that an illustration created for commercial use cannot exist in a native-

format vacuum. Canvas' lack of support for editable Illustrator exchange formats is a crippling one. FreeHand can open, edit, and export editable Illustrator formats (FreeHand even optimizes EPS export for rasterization in Photoshop.) When Canvas exports EPS files, they become uneditable, so Canvas is utterly useless for commercial purposes.

I would love to be getting acquainted with the new Canvas (and giving the program's vector-based illustration tools a fighting chance) by creating illustrations and then saving them as Illustrator files for incorporation in FreeHand or PageMaker layouts. But given Canvas 5's many, many bugs, I'm not about to risk a paying project by painting myself into a modifiable-in-Canvas-only corner. Canvas 5 is very, very promising — and even more disappointing.

James Talmage
JET Studio, Byron, GA

THANK YOU FOR INCLUDING Canvas 5 in your article on professional drawing applications. However, the article overlooked some important features of which your readers should be aware. Among them:

- In the Drawing and Editing section, you state that "Illustrator's pen tool rises above the others," yet you fail to mention that it takes Illustrator three tools — not one, as in Canvas 5 — to create, edit, and move Bézi-ers.

- In the Fills and Strokes section, you give the "best of category" award to Illustrator but fail to mention that anything in Canvas 5 can serve as a fill "ink" (including solid colors, gradients, hatch patterns, images, and vector-based objects). Also, unlike its competition, Canvas 5 can apply any ink to both an object's fill and its stroke.

- You said Illustrator's "eyedropper tool is the best in the business" because it can sample colors outside of the application. Canvas 5's



Open Folder

Alex Tressor, of New York City, could use a cold shower. "Here is how I see what's wrong with Apple," says Alex. "Sex, sex, sex. Apple has lost its forbidden-fruit quality. My first Mac SE had more testosterone than a Ferrari. It was an out-of-the-box-sexy machine that never quit. Then the safe-sex attitude infected Apple designers. Apple has become an Apple sauce with no bite to it. Sexy, sexy, sexy has been replaced by butt ugly. I long for the sex-exuding Color Mac — 'Whoa! Any more of this and MacUser will be banned from grocery-store shelves. Which raises the question 'Would you let your daughter marry a Mac user?'"

Sex education may be a controversial topic in some schools, but Michael Maltese, a senior at North Brunswick Township High School in New Jersey, has seen to it that he and his fellow students and teachers receive a "sexy" education. Armed with a lab full of comely Macs, Michael has whipped through his school's computer curriculum, taught classes to other students, instructed teachers on how to incorporate the technology into their lessons, and won his school a grant for free Internet access. He even got the New York Times Young Citizen's Award for 1996. Wow. At a time when scores of supposed Mac faithful have been waving the white flag and embracing the Wintel blitzkrieg with all the enthusiasm of the vanquished, we feel that Michael should also receive the Apple Medal of Honor for his brand loyalty.

Such patriots are getting harder to find. Unfortunately, Jack Harden even found an "expatriot" in our midst while reading our November Help Folder column. For clarification, Rhoda, our associate technical editor, is a British expatriate. But although she's now a passport-packing Yankee, she still feels an abiding love for Queen, country, and Macintosh. In fact, when the chips are down and the rumble of Windows 95's advance draws uncomfortably near, Rhoda rallies our staff by roaming the hallways Churchill-style and exclaiming, "This is our finest hour!"

WRITE TO LETTERS

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eyedropper has the same capability.

• Your article never says that Canvas 5 provides presentation abilities with PowerPoint/Persuasion-style transitions and timing effects and that it can create, save, and embed documents in the QuickTime movie format. Nor is there any mention of Canvas' QuickDraw 3D capabilities. These technologies help distinguish the Mac OS from Windows 95 and set Canvas 5 apart from its competition.

• Most important, you missed several of Canvas' image-editing features, such as 24-channel transparency options and color correction and conversion. Image editing accounts for more than one-third of Canvas 5's features; in your Drawing and Editing Features table, all these features are reduced to one item.

Compared on a feature-by-feature basis, Canvas 5 clearly is a professional tool that "high-powered designers" can depend on. More than their "sole drawing program," it's designed to be their graphics workflow hub.

Douglas D. Levy, VP, Corporate Communications
Deneba Software, Miami, FL

As we stated very clearly in the article, we were looking at how well each program worked as a drawing program, and we rated each program as such. Canvas' features in categories other than drawing were mentioned several times in the article but were not a major factor in the mouse ratings. If we were to have considered these features, the article would not have been a comparison of drawing programs but a comparison of graphics packages. This approach would have entailed a much broader scope than was intended.

We appreciate your input on the functions of various Canvas tools and features. Although we worked with you to clarify these functions as much as possible during the review process, some omissions and inaccuracies went unnoticed.

Canvas is well crafted and offers myriad graphics features. However, its drawing environment — although very good — is not better than FreeHand's or Illustrator's overall. /SJ

Camera Chimera

A SIDEBAR IN YOUR "Digital Cameras Exposed" story (November '96, page 90) says that the Kodak EOS-DCS1c "offers 35mm-film quality." I'm sorry, but an 18-MB file is nowhere near 35mm-film quality. And although the CCD chip in this camera is very good, it still can't match the color, grain, and latitude of even 400-ISO-speed film. As an automotive-advertising photographer, I can't wait for the day when I can shoot with a camera like this

and get true 35mm-film quality, but that day is not quite here yet. Maybe another three to four years?

Dean Siracusa
CarShooter@aol.com

SEVERAL COLLEAGUES AND I recently evaluated megapixel cameras. We decided on the Minolta RD-175, because it accepts all Minolta-mount lenses, stores images on PC Cards, and provides a workable compromise between resolution and price.

This camera is capable of very sharp, high-definition images. However, the software provided by Minolta cripples the camera. RDGrabber, the application and Photoshop plug-in for downloading images from the PC Card to the Mac, scrambles our card whenever we try to delete an image by using the invitingly highlighted Delete button. Also vexing is that RDGrabber cannot cooperate with third-party PC Card readers. Instead, cards must be formatted by the camera so that an invisible file is written to the disk. Without this undocumented file, cards will not be recognized by the camera.

Until Minolta can ship a fully debugged version of RDGrabber with the camera, the RD-175 will not live up to its considerable potential.

Matthew B. Hamilton
mhamilton@igc.apc.org

AFTER TAKING A FEW moments to read your digital-camera article, we thought we should send you a quick note indicating some of the misquoted facts.

The Polaroid PDC-2000/40 and the PDC-2000/60 hold 40 and 60 high- and superhigh-resolution images, respectively. And the PDC-2000 does let users lock the autofocus by pressing the button halfway.

The lens of the PDC-2000 is not fixed — Polaroid offers an interchangeable (optional) 60mm-equivalent lens.

The PDC-2000 is singled out for not letting users save raw files (and choose resolutions later). But the definition of raw files is not consistent across the board. The article suggests that the PDC-2000 should allow users to save raw uncompressed files to take advantage of our unique image format. Some of the cameras that were listed as having the raw-file feature actually save raw but compressed files — by MacUser's definition, not raw.

Kimberly R. Mattis, Publicity Specialist
Polaroid, Cambridge, MA

Tall PowerTower Tales?

I'M CURIOUS. What computer were you looking at in your review of Power Computing's new PowerTower 200e and 180e ("Mac OS Systems," November '96, page 60). I telephoned Power Computing and checked the company's Web page, and no company representative I talked with knew anything about the IMS TwinTurbo graphics card the review said each PowerTower ships with. The graphics card is around \$500 extra for this machine. (It does come standard on the PowerTower Pro.) The article also said the 200e and the 180e ship with 32 MB of RAM. Nope. Try 16 MB.

What gives?

Jason W
jw15851@academia.swt.edu

/Power Computing builds systems to order, allowing you to choose from multiple RAM, hard-drive, and graphics-card options (including setups with 32 MB of RAM). The systems Power supplied us were 32-MB/2-GB systems with IMS TwinTurbo 128M graphics cards; their prices and ratings reflect that configuration. /JA

It Beats Working

BRAVO TO ANDY IHNATKO for "The Temp's Guide to Wasting Time" (October '96, page 125). I've found that certain employers of temps are unyielding on their maximum hourly rate of pay. But I've also had others pay me a dubious hourly rate just to come in every day and literally do nothing while awaiting some piece to fall into place on "the big project." As long as temp employers insist on paying me just to be in standby mode, you bet I'm going to work on my screenplay and catch up on my reading.

name withheld
via the Internet ☞

Corrections

The price for the Kodak Digital Science DC50 should have been listed as \$995 in the Bottom Line of "Digital Cameras Exposed" (November '96, page 92).

The price for the Practical Peripherals MacClass MC288LCD V.34 ("V.34 Plus Modems: Full Speed Ahead," November '96, page 116) should have been listed as \$369.

FireWire can accommodate up to 63 devices in a chain, not 127, as indicated in "Looking into Apple's Future" (October '96, page 66).

Due to an editing error, the Bottom Line section of our digital-video-card review (November '96, page 68) misstated the author's opinion of two cards, the Truevision Targa 1000 Pro and the Data Translation Media 100qx, both of which deliver video that is at the low end of broadcast quality.

A rose is a rose is a... wait a second.



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1 Standard Interleaved Memory Every S900 comes standard with interleaved memory on the motherboard for workstation-quality 128-bit access memory and best system performance. Others only provide 64-bit access memory.

2 Advanced Scalable Processor Design (A.S.P.D.) This modular configuration provides easy upgradeability to add or change processors as desired. Costs you less and is far more flexible, allowing your system to grow as you do.

3 UMAX PCI-to-PCI Bridge The S900 is the first to allow burst communication between all six (6) PCI slots, no matter where devices are inserted, for greater expandability and easy set up. Others only offer 3 slots in two separate banks at most.



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PAMELA PFIFFNER

Auld Lang Syne

I HAVE A THEORY that what you do on New Year's Eve affects what the new year will be like for you. For instance, a year of adventure and travel for me began in Edinburgh on Hogmanay, the Scots name for December 31. The New Year's Eve on which I hosted a large and boisterous party segued into a yearlong social whirl of nonstop entertaining. And last year, I held an intimate dinner party for close friends and select business acquaintances, and sure enough, this year has been almost all work and no play, except for quiet evenings with a pal or two.

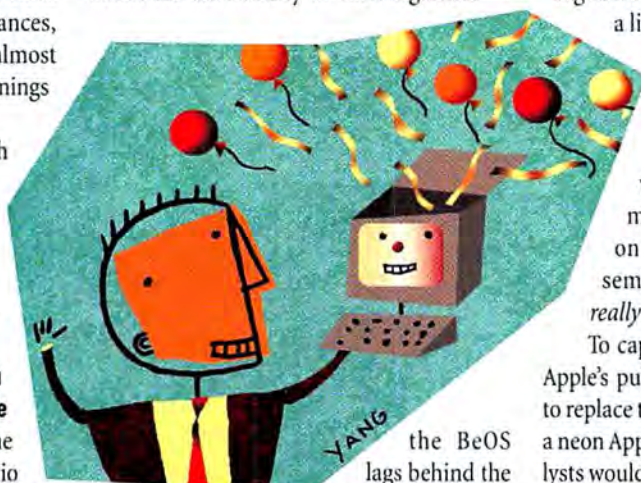
I suppose one could read too much into this kind of thing, but if my theory holds, those who lead the Mac market may want to think carefully about how they spend this New Year's Eve and perhaps consider these suggestions, humbly submitted:

Have Gil Amelio host the "Countdown to '97" bash televised from the Space Needle in Seattle. When he took over the helm of Apple nearly a year ago, Amelio promised that the bunker mentality of the Spindler era was over, that his role was to be more visible and more approachable. After a promising start, he's all but disappeared. Putting Apple's financial house in order has certainly taken a lot of his attention — and he's made great strides in that direction, as Apple's \$25 million profit for the fourth quarter attests — but apart from a few high-profile, blockbuster events, he's been lying low. Are we back to where we started? I hope not. Come on, Gil: Break out those noisemakers.

And what better place to bust out than in Billy G's backyard? It's time to take it right to Microsoft: Become the spotlight performer on the high-tech American Bandstand instead of shuffling at the edges of the dance floor.

Be sure to invite Jean-Louis Gassée. Former Apple bad boy and the driving force behind Be Inc.'s jazzy new operating system, Gassée should be Apple's guest of honor at its New Year's bash. As we describe in this month's

cover story, the Be operating system is one of the most exciting possibilities for the Mac we've seen in a while. The BeOS is nimble, agile, and smart. Best of all, it's already running on Power Mac hardware. Adopting it could speed up Apple's OS development by years and give Mac users an OS that competes toe to toe with Windows NT. Oh sure, there are questions about the advisability of such a gambit —



the BeOS lags behind the Mac OS in interface and so-called middleware technologies. But right now it seems a gamble worth taking.

According to Metrowerks' Jean Belanger, creator of the widely respected CodeWarrior development environment, the BeOS is compelling for application development. Best of all, Metrowerks already has tools available for developer wannabes.

Send Mac SWAT teams to the houses of Wall Street analysts putting together the Wintel computers they got during the holidays. More than technology, what drives product development is Wall Street. When publicly traded companies show their business models to the analysts who recommend stocks, the line most scrutinized seems to be the one showing the company's ratio of Mac products to Windows products. I've talked to many Mac developers about their apparent shift to Windows, and they admit they're adjusting their product line to better appease investors. This is fair enough

from a bottom-line perspective, I suppose. But most financial analysts use PCs. Perhaps if they actually *used* Macs, they'd soften their anti-Apple stance.

By stemming the flow of red ink with each fiscal quarter, Amelio & Co. are turning some skeptics into believers. But Apple hasn't been terribly successful at wooing Wall Street. Seeding them with Macs might infuse them with a little evangelical zeal.

Take over Times Square. To combat negative press, Apple PR should sponsor the New Year's party in the heart of the world's largest media and financial markets. Picture David Letterman on the Jumbotron telling the assembled throngs who the Big Apple really is.

To capitalize on its world-famous logo, Apple's public-relations team could arrange to replace the giant ball in Times Square with a neon Apple logo. But because financial analysts would question the wisdom of spending millions on this party, Apple would need to cut a deal with the New York City board of tourism so that a portion of the proceeds from the sale of Big Apple souvenirs that day would be applied to the company's bottom line.

At the stroke of midnight, people around the world would see the Apple logo blazing a bright trail as it plummets to earth, to the delight of the Wall Street bankers gathered below. But in a stunning display of derring-do, Guy Kawasaki would manage to catch the logo and push it back up, thus effectively turning back the clock on Apple.

OK, I got carried away on that last one, but you get the drift: 1997 will be a pivotal year for Apple. Amelio has projected that the company will return to sustainable profitability in the second fiscal quarter. At least two OS releases are slated, for January and July. Critical decisions must be made on all fronts, software and hardware. So let's take a cup of kindness for a prosperous 1997. ☞

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NEWS

MACUSER EXCLUSIVE

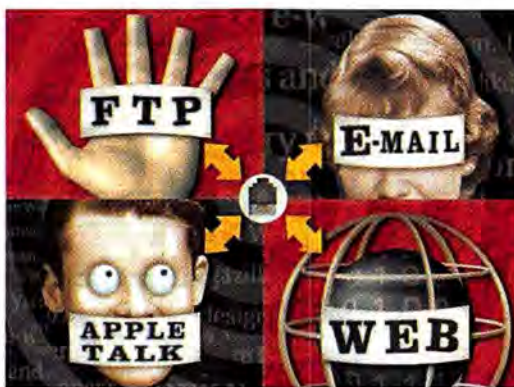
Future AppleShare to Serve Up Faster TCP/IP Connections

New Macintosh server software will do e-mail, FTP, and the World Wide Web.

YOU'LL SOON BE ABLE TO SHARE files over the Internet as easily as you share them on your local network, thanks to the latest version of Apple's AppleShare file-serving technology.

Code-named FutureShare and expected to ship early in 1997 (a public beta version should be available sometime in January), this new software will turn an AppleShare server into much more than just a file server. A machine running FutureShare will be a full-fledged Internet server, offering e-mail, FTP, Web, and AppleTalk services. FutureShare marks a major shift in Apple networking software, from AppleTalk to TCP/IP.

FILE SERVER. Right now the only method for logging onto an AppleShare server is via your local AppleTalk network. You'll still be able to connect to a FutureShare server via the Chooser, but now you will also be able to mount servers on your desktop via the Internet by typing in the server's name or IP address. And if you need to transfer files from a machine that isn't AppleShare-capable, you can log onto the file server via Internet FTP.



FutureShare's built-in FTP-server software supports BinHex and MacBinary encoding, so server administrators won't have to do any extra work to make sure Mac-native files will be intact when the files reach their destination.

Keep in mind, however, that only FutureShare will be able to serve volumes via TCP/IP. Whether you'll be able to serve files this way on your own

Mac, using file sharing, is still tied to Apple's future operating-system plans.

WEB SERVER. FutureShare comes with built-in Web-server software that shares security and administration with the file-server software, so no additional configuration is required. The software even supports CGI applications, although it won't support Web-server plug-ins at first — that's planned for a later release.

MAIL SERVER. The FutureShare Internet-mail-server software is going to support the POP3 and SMTP protocols,

which means it will be compatible with just about every e-mail client program (including Qualcomm's Eudora, Claris EMailer, and Netscape Navigator) on any platform. Apple says that it plans to support IMAP — a mail standard that offers more features than POP/SMTP and that is growing in popularity.

PRINT SERVER. Not to be forgotten is FutureShare's new print-server software, which replaces the lackluster software available in previous versions of AppleShare. The new server software will let users in a workgroup queue up print jobs without tying up their Macs, will support load balancing to multiple printers, and is fully PowerPC-native and Open Transport-savvy.

UNIFIED INTERFACE. Perhaps the most attractive part of FutureShare is its OpenDoc-based interface, a one-stop control panel for administering every aspect of the AppleShare server. By wrapping control of all server software into one package, FutureShare should eliminate the administrative hassles caused by having to adjust the preferences of several unconnected server applications.

Like AppleShare, FutureShare will be available as part of Apple's Workgroup Server products, which means you won't be able to install FutureShare on your own Mac. Apple isn't saying if it might also make FutureShare available as a stand-alone product that users could buy and install on existing Power Macs. / JASON SNELL

FUTURE TECH

PowerPC Speeds Increase Exponentially

MACS ARE ABOUT TO GET a speed boost the likes of which they've never seen before. If all goes according to plan, next spring you'll see Macs with PowerPC processors — actually, PowerPC-compatible processors — running at over 500 MHz. San Jose-based Exponential recently announced three new X704 processors running at 466, 500, and 533 MHz. At press time, neither Apple nor any clone vendor had announced an X704-based system, although several are rumored to be in the works.

Exponential is able to achieve these astonishing speeds by employing bipolar-transistor technology for most of the chips' logic circuits. Because they require a smaller voltage swing to switch between a 0 state and a 1 state, bipolar transistors can run much faster than CMOS transistors.

(PowerPC chips use CMOS transistors.)

Bipolar-technology chips have two disadvantages. One: They're power hogs. Exponential is confident that the power supplies in today's high-end systems are adequate to the task. Two: They run hot. Consequently, X704s come equipped not only with their own heat sinks but with fans as well.

One caution: Although the new processors will be more than twice as fast as today's crop, don't expect to see actual speed double. Many other factors, such as memory-bus speed and L2-cache size, also affect processor speed. Until new logic-board designs are created to better support the high-speed chips, the boost that's offered will be somewhat less than their clock speed might indicate.

/ HENRY BORTMAN

NEW & NOTABLE

SOFTWARE

MarinerWrite. This new low-cal word processor runs on half the usual system requirements and costs significantly less than The Other Guys. Macintosh Drag and Drop support, multiple undos, and multiple-file-format support add to its appeal. \$69.95. Mariner Software: 502-222-6695; <http://www.marinersoft.com/>.

Nisus Writer 5.0. The new version of Nisus Writer is one of the first word processors that can act as a "container" for OpenDoc parts. Other new features include custom style libraries and the option of saving text in HTML format. \$249; upgrade, \$69 (\$89 with printed manual). Nisus Software: 800-281-0101 or 619-481-7197; <http://www.nisus-soft.com/>.

WorkingPapers. Released on the Mac first, this new document-management software combines integrated OCR and digital-cataloging capabilities for archiving documents. \$99 through 1996; \$199 thereafter. Dominion Software: 800-762-7633 or 617-332-1144; <http://www.dominionsw.com/>.

Extreme 3D 2. New Metaforms and Particle tools enhance the latest version of this 3-D software. It includes support for the GIF, JPEG, VRML, 3DML, and xRes LRG file formats and Macromedia Information Xchange and Open Architecture. \$399; upgrade, \$149; studio upgrade, \$199. Macromedia: 800-470-7211 or 415-252-2000; <http://www.macromedia.com/>.

▼ **Cumulus Network 3.0.** More than 100 new features beef up the new version of this media-management system. Smaller-budget businesses can catalog and manage images with the new Desktop Plus version, which contains Canto's royalty-free browser and other extras.



Desktop version, \$99; Desktop Plus version, \$595; network five-client starter kit, \$1,995. Canto Software: 415-905-0300; <http://www.canto-software.com/>.

MediaAssets 1.5. Businesses can store, organize, and retrieve digital images, sound, and video in a networked searchable database. Support for QuarkXPress means you can preview pages and see specific information for each document. Passwords allow secured access over the Web. \$1,000 per concurrent user. MediaWay: 800-632-7401 or 408-748-7400; <http://www.mediaway.com/>. / BROOKE C. WHEELER

FIRST LOOKS

Chatty MacInTax: Adds Streamlined Interview for 1996

PREPARING A TAX RETURN is probably not your idea of a good time, even if you're due for a sizable refund. MacInTax, the Mac's premier tax program, has at least succeeded in making the process easier.

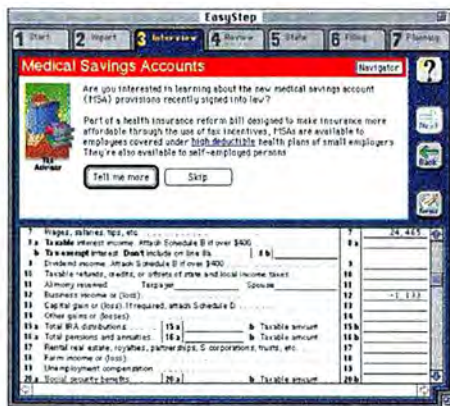
Like last year's edition, MacInTax Deluxe for 1996 asks you for information needed to fill out your federal tax forms and gives instructions and information from tax experts and books. But the Q&A process has been revamped—you get more questions up front so that fewer have to be answered later. If you're fairly tax-savvy, you can streamline MacInTax's interview process by using the Fast Track option. MacInTax will then skip over irrelevant forms, although you'll still see some interview questions that don't pertain to you.

Rather than prompting you for information field-by-field, MacInTax now places all of a tax form's fields in one window, simplifying fill-in. Unfortunately, our MacInTax interview wasn't as short

as it could have been, despite the Fast Track feature, because the Deluxe version frequently interrupted our interview with videos containing tax advice. Even though we didn't appreciate the program's obtrusive help during the interview, we liked the pumped-up help in the review section, which compared our return against U.S. averages and told us how likely we were to be audited—and why.

Obtrusive help system aside, MacInTax's 1996 edition continues to advance the software's reputation as the best tool for dealing with taxes.

/ CAROLYN BICKFORD



You have fewer interview questions to answer if you use MacInTax Deluxe's Fast Track option, but you'll still get bombarded with tax advice and tips.

PROS: Interview better tailored to your situation. More tax-form fields in single step.
CONS: Advice within interview interrupts tax-preparation process.

INFO: \$50 (estimated street). Intuit: 800-446-8848; <http://www.intuit.com/>.

The Taxman Cometh, Part II

FOR THOSE LOOKING to economize at tax time, MacInTax is available in a floppy-disk version that includes its Deluxe sibling's streamlined interview process but not the extensive online video and book references. \$40 (estimated street). Intuit: 800-446-8848; <http://www.intuit.com/>.

The main alternative to MacInTax, Kiplinger TaxCut, sports a Mac-friendly interface in its latest update. Like MacInTax, TaxCut can help you find out the likelihood of an audit and assist in the preparation of next year's return.

The 1996 edition of TaxCut is considerably more appealing than last year's version, because the navigation topics have been moved into a pop-up menu and, as a result, interview questions are not cramped into a narrow window. Unfortunately, the program still offers state editions only for California and New York. \$40 (estimated street). Block Financial:

800-235-4060; <http://www.conductor.com/lalas/taxcut/taxcut.html/>.

Parsons Technology has discontinued its Mac tax program, Tax Edge. / CAROLYN BICKFORD



Kiplinger TaxCut has an improved, more-Mac-like interface this year.

Unique UniQorn 1.1: Makes Web Page-Layout Magic

IT COULD BE THE MIRACLE Mac app you've been waiting for: With one click of the mouse, it transforms page layouts with typography and graphics galore into tiny Web-ready files. But the source of this magic isn't QuarkXPress or Adobe PageMaker, it's UniQorn — an upstart application whose newest version will let you export pages as Java applets. UniQorn 1.1 (\$895), expected to be shipping by November 1996, isn't as easy to use as some page-layout programs and requires that you install QuickDraw GX. But as a tool for creating Web pages, it's worth the effort to learn, as our first look showed.

One of the biggest challenges of repurposing content is the layout limitations of HTML, the Web's universal language. UniQorn 1.1 gets around this by creating Java applets instead of HTML. Java efficiently describes complicated pages, so you can export your layout as is. Even after UniQorn converts graphics to GIF or JPEG, files stay quite small.

There are drawbacks. UniQorn Java can be read only by Java-savvy Web browsers, so not everyone

PROS: Complex page layouts are Web-ready with one export command.

CONS: Requires QuickDraw GX. Only newer browsers can read Java code. You must wade through a confusing manual to get the most from the program.

INFO: \$895. SoftPress Systems: 800-853-6454 or 415-331-4820; <http://www.softpress.com/>.



Not all smoke and mirrors, UniQorn 1.1 uses Java to create complex Web pages that have small file sizes. This graphics-rich page is 113K.

will be able to see your pages. And Java can be problematic on the Mac — sometimes pages don't load on the first try.

UniQorn 1.1 will offer unique effects that are made possible by QuickDraw GX, including tremendous typography control with GX fonts. Additional special features include the ability to knock out text; automatic reformatting; enhanced WorldScript support for multiple languages; and the ability to type along a path, much as you can in drawing programs. Unfortunately, some of UniQorn's coolest features require assistance that's

IN BRIEF

Sorry, Macs Only!

WINDOWS BE DAMNED, says the first Mac-only nationwide Internet service provider. MacConnect, slated to serve 70 cities starting in mid-November 1996, will provide Mac users with unlimited Internet access for a flat monthly rate. Equinox Internet Services declares that MacConnect will "cater to Mac OS users and not sell one second of Internet access to users of Windows." E-mail, Web-page space, and a free Web browser of choice are included. \$19.95 per month. Equinox: 800-923-2638 or 516-754-3020; <http://www.macconnect.com/>. / BROOKE C. WHEELER

True(r) WYSIWYG for the Web

WHAT YOU SEE in your edit window and what you get in your browser window often don't come close when you use supposedly WYSIWYG tools to make Web pages. But hope springs anew with two tools designed for the HTML-illiterate who wish to stay that way and make perfect pages.

Symantec's \$99 Visual Page will offer a full set of features, including drag-and-drop Java and the best table tool we've seen so far — your text even rewraps while you drag columns or rows to the width you want. Claris Home Page 2.0, \$79, will add features missing from 1.0, including a spelling checker and support for multimedia plug-ins and image maps. Symantec: 800-441-7234 or 541-334-6054; <http://www.symantec.com/>. Claris: 800-544-8554 or 408-727-8227; <http://www.claris.com/>. / SCHOLLE SAWYER

difficult to extract from the application's confusing manual.

For now, UniQorn's Java pages can't include the blink or bounce of animation, but the next version (expected in early 1997) should support QuickTime and Shockwave files and the GX-based programs Electrifier and Dancer. / SCHOLLE SAWYER

CLONE WATCH

Low-End Clones Multiply

THE BATTLE FOR THE LOW END of the Mac-clone market is heating up. Mac mail-order vendor APS Technologies has now joined the clone club, with its M*Power systems, which are based on the Motorola StarMax design. And UMAX has extended its low-end line, with the C500 and C600, including the previously unannounced C600/240.

APS will offer three M*Power systems. The M*Power 603e160 contains a 160-MHz PowerPC 603e with no L2 cache; the 603e200 has a 200-MHz 603e with a 256K L2 cache. Both will ship with 16 MB of RAM, a 1.2-GB hard drive, an 8x CD-ROM drive, and 1 MB of VRAM. The 603e160 will sell for \$1,399 and the 603e200 for \$1,599. The M*Power 604e200 (\$2,599) will have a 2.5-GB hard drive, 2 MB of VRAM, a 512K L2 cache, and — of

course — a 200-MHz 604e processor.

UMAX now has a SuperMac model that offers processing power rivaling that of Power

Computing's beefiest PowerBase system: The SuperMac C600/240 (\$2,295) sports a 240-MHz 603e. The C600 line also includes the C600/200 (\$1,995) and the C600/180 (\$1,695), which have a 200-MHz and 180-MHz 603e chip, respectively. All C600 systems are configured with 16 MB of RAM, a 2.1-GB hard drive,



an 8x CD-ROM drive, a 256K L2 cache, 1 MB of DRAM (for graphics display), and a Global Village 28.8-kbps internal fax modem. UMAX includes an excellent bundle of productivity and Internet applications as well as several CD-ROM titles.

The least-expensive system from UMAX, the \$1,349 C500/166, undercuts APS' lowest-cost system. The C500/166 has a 166-MHz 603e; 8 MB of RAM; a 1.2-GB hard drive; and like the C600 systems, a 256K L2 cache and 1 MB of graphics DRAM. It does not include a modem. / HENRY BORTMAN

NEW & NOTABLE

HARDWARE

ATI Xclaim VR. A five-in-one card, the Xclaim VR provides QuickDraw 2-D and 3-D acceleration, QuickTime capture and playback acceleration, and video in. An optional \$99 Xclaim TV tuner lets your computer receive up to 125 channels. \$269; Xclaim TV add-on, \$99. ATI Technologies: 905-882-2626; <http://www.atitech.ca/>.

ATI Xclaim 3D. Based on ATI's 3D RAGE technology, this card — which is slated to ship in December of 1996 — accelerates 3-D graphics on PCI-based Macs. It includes boosted QuickDraw 3D performance, filtering, and other effects. Upgradable to 8 MB. 4-MB card, \$349; 2-MB upgrade, \$99. ATI Technologies: 905-882-2626; <http://www.atitech.ca/>.

BARCO Personal Calibrator. Get properly calibrated color with this 21-inch color-calibrated monitor that has a top resolution of 1,600 x 1,200 pixels. Calibration software is included. \$4,295. BARCO Display Products: 770-590-7900; <http://www.mindspring.com/~barco/>.

CTX Opto PanoView 600. This multiplatform 12-inch LCD monitor, which weighs only 8.6 pounds, provides a supersharp image at a screen resolution of 800 x 600 pixels. \$1,850. CTX International: 888-827-4121 or 408-541-6060; <http://www.ctxopto.com/>.

▼ **MicroNet DataDock 7000.** A sleek, 7-bay chassis

houses platform-independent RAID 0, 1, 3, and 5 drive modules that offer transfer rates up to 40 MB per second. The system provides fault-tolerant, swappable modular drive functionality for large arrays. Chassis, \$3,499. MicroNet Technology: 714-453-6000; <http://www.micronet.com/>. **Proxima Lightbook.** Built to withstand the abuse of travel yet weighing only about half as much as other desktop projec-

tors, the compact Lightbook uses the Proxima Cyclops remote control to perform special effects for multimedia presentations. \$4,999. Proxima: 800-447-7692 or 619-457-5500; <http://www.prxm.com/>.

Global Village TelePort 33.6 Internet Edition. This desktop fax modem offers 33.6-kbps data speed and 14.4-kbps fax speed. New features include drag-and-drop fax capability, the Setup Helper, and a status menu. \$169. Global Village: 800-736-4821 or 408-523-1000; <http://www.globalvillage.com/>. / BROOKE C. WHEELER



Java Succumbs to an Irresistible Force

Sun to adopt QuickTime in Java Media, add gateway to OpenDoc.

SUN MICROSYSTEMS AND APPLE have taken some steps to bolster interoperability between Apple technologies — including QuickTime and OpenDoc — and Sun's Java multimedia programming language, which has become a favorite tool for adding interactivity to Web pages.

Until recently, Sun's Java-development division, JavaSoft, had resisted Apple's push to make QuickTime a standard for Java. The two companies were sketchy on the details of their agreement, but this new deal follows Apple's submission of several QuickTime-oriented class libraries to JavaSoft. Sun indicated that QuickTime will be available as an API option within Java Media.

The two companies also announced that their Java cooperation will spread to components and said work has begun on a gateway between Java Beans and OpenDoc.

Java Beans, Sun's platform-independent object-based architecture, will allow developers to build applets in Java that can run within various component architectures and operating systems. Sun said it expects to release Java Beans code by the end of 1996.

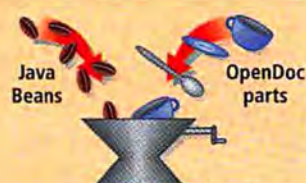
The integration of the two technologies will take place in two stages. The first part, which should be completed by the end of 1996, will allow users to embed Java Beans components in OpenDoc

containers as well as fit OpenDoc parts, also known as Live Objects, into Java Beans-compatible applications. The second stage, to be completed in 1997, will make OpenDoc APIs accessible from Java, letting developers write OpenDoc parts from within the Java environment.

Linking OpenDoc and Java Beans



First, users will be able to put Java Beans applets inside existing OpenDoc applications.



Integrated application

Later, users will be able to build Java Beans-based applications that include OpenDoc functionality.

Although IBM, which has already embraced Live Objects, did not participate in the announcement, it has its own Java Beans-OpenDoc meld under way. Called Blue Java Beans, the project will integrate OpenDoc and Java Beans on the Windows platform.

Apple and Sun also said they were improving the connectivity between Macintosh client systems and Sun servers. Sun said that it would alter its Solaris OS and Solstice network-management tools in order to give Macintosh clients direct links with Sun servers. / CLIFFORD COLBY, KELLY RYER, AND THE MACWEEK STAFF

New Modems to Hit Warp 56

ROCKWELL SEMICONDUCTOR and Motorola's Information Systems Group are developing technologies that will increase the speed of modems to 56 kbps — half the speed of ISDN adapters and nearly twice the speed of today's fastest modems.

Rockwell plans to introduce its new modem and a group of modem-chip sets that implement the speed boost in November. The speed boost of this technology will be most noticeable when Internet users move data from high-bandwidth links over phone lines, the company said.

Motorola's architecture will be able to provide

56-kbps speeds from Internet service providers (ISPs) to users and 33.6-kbps speeds from users to ISPs, according to Motorola.

Diamond Multimedia said that in the second quarter of 1997, it plans to introduce a 56-kbps Mac modem using Rockwell's technology. Diamond said that, like Motorola's 56-kbps technology, Rockwell's will offer 56-kbps speed in one direction and 33.6 kbps in the other. Diamond Multimedia: 800-468-5846 or 408-325-7070; <http://www.diamondmm.com/>. / JOANNA PEARLSTEIN AND THE MACWEEK STAFF

Web Publishing: Version Two

Next-generation layout applications expand World Wide Web tools.

ADOBE PAGEMILL AND ITS WYSIWYG brethren are a big improvement over text-based HTML editors, but even at their best, they feel more like word processors than like page-design applications. Although these apps take raw HTML and give it a pretty face, the next generation of Web-authoring tools will make Web design as easy as building a printed page in Adobe PageMaker or QuarkXPress.

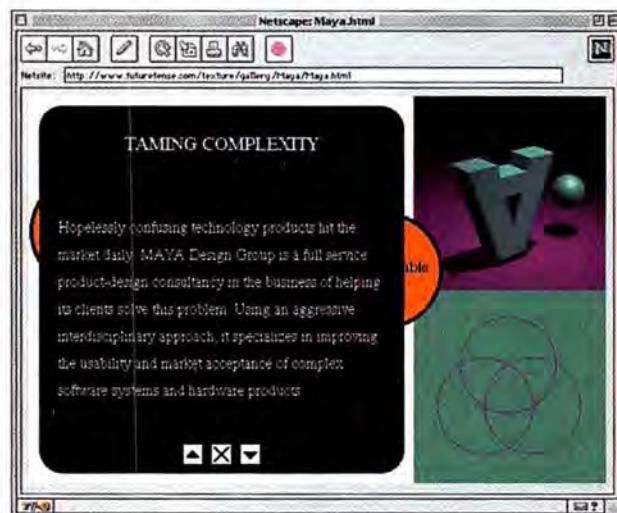
The most frustrating thing about designing Web pages is that you can't have precise control over text and images. But NetObjects Fusion (\$695), from NetObjects (415-562-0285; <http://www.netobjects.com/>), which is currently shipping for Windows 95 and due out for the Mac by the end of 1996, lets you place text and images anywhere you want. Once you're done designing a page, Fusion calculates the HTML code needed to make the page appear correctly in a Web browser. Fusion can also create default styles for a site, so you can easily make global changes.

Similar to Fusion is Insta.html (\$179), an

Xtra for Macromedia FreeHand 7 from Trailer Parc (415-248-1350; <http://www.trailerparc.com/>). Once Insta.html is installed, users can place text and images in FreeHand in a free-form fashion and then export the result to an HTML file. Like Fusion, Insta.html uses HTML tables to make text and graphics align correctly.

Texture ► (\$495), from FutureTense (508-263-5480; <http://www.futuretense.com/>), goes even further: It offers layout freedom without making you bother with HTML code. Instead, you export pages as Java applets that can be viewed in any Java-savvy Web browser. By using Java, Texture gives authors more

control than HTML allows, and documents are able to include embedded typefaces and interactive elements. / JASON SNELL



MOS Gathers on WebStar

NO SOONER HAD the first organization devoted to Mac Internet standards formed than a controversy began brewing. The tight-knit Mac Internet developer community found itself divided over Web-server plug-in architecture.

MIDAS (Macintosh Internet Developers' Association) was formed by Internet-application developers last summer for the purpose of promoting the Mac as an Internet platform and agreeing on technical standards. One de facto standard few expected to face a challenge was Quarterdeck's WebStar Web-server plug-in architecture, WebStar API (W#API). Market leader Quarterdeck's move from CGI (Common Gateway Interface) applications to compiled plug-ins promised speedier, more reliable server add-ons. Even Quarterdeck competitors such as ResNova, maker of Boulevard, and Spider Island Software, maker of TeleFinder, announced support for WebStar-compatible plug-ins.

But delays in the release of WebStar

2.0 and the W#API spec led a frustrated ResNova to take a bold step: The company developed its own plug-in architecture, called MOS, and sought ratification by the nascent MIDAS. Unfortunately for ResNova and other MOS supporters, such as Spider Island and Chris Hawk, a developer of freeware Web-server software, MIDAS hasn't yet come up with a procedure for ratifying standards, making it difficult for the organization to act on ResNova's request. CGI and plug-in vendors who have been lining up behind W#API have not announced MOS support, preferring instead to write applications that support the early version of W#API that is available in WebStar 1.3.

At press time, Quarterdeck had announced plans to ship both WebStar 2.0 and documentation for W#API in November of 1996 and ResNova had not yet shipped its MOS-compatible server, called Boulevard. MIDAS has not yet issued a decision on the MOS-versus-WebStar controversy. / SHELLY BRISBIN

The Geek Beat

SERVERS. Designed for prepress and digital-video workgroups, Augment's AFX 210 and AFX 410 servers are, in essence, enormous disk and network I/O systems with a Macintosh for an interface. Connected to the bundled Power Mac 7200 system console is a disk farm with up to 120 GB of storage; one to six file-management processors, each with a 128-MB cache; and a high-speed FC-AL network interface and hub. The servers use special file-management software to accelerate transfers to a full 10 MB per second, according to the company. Prices range from \$50,000 to \$150,000. 508-392-3626; <http://www.augment-systems.com/>. Oracle's Universal Server has been certified compatible with Apple's UNIX-based Network Servers. Certification for Oracle Workgroup Server, WebServer, and Developer 2000 products is still in the works.

INTERNET TOOLS. Apple has introduced Audioactive, an audio format developed by Telos for streaming sound files over the Internet. Audioactive streams can be played through Macromedia Shockwave-equipped browsers or with a stand-alone player, available at <http://www.audioactive.com/>. The development environment formerly known as Novell AppWare has been renamed and revamped by its new owner, Network Multimedia. Microbrew, as it is now called, focuses on CGI (Common Gateway Interface) application development and costs \$89. AppWare upgrades are \$29. 801-261-9668; <http://www.networkmultimedia.com/>. PowerGate, a CGI application from Acme Technologies, provides a Web interface to Sophisticated Circuits' PowerKey Pro power-control unit. Using the PowerGate interface, you can remotely restart or shut down Macs connected to PowerKey Pro. \$49. 203-969-1335; <http://www.acmetech.com/>.

TELECOMMUNICATIONS. Second Wave's CommBlaster PCI card holds as many as eight 28.8-kbps or 14.4-kbps modems for use in remote-communications serving or other situations where support for multiple modem lines is required. Prices range from \$395, for a two-modem 14.4-kbps version, to \$2,495, for an eight-modem 28.8-kbps configuration. 512-329-9283; secdwave@flash.net. / SHELLY BRISBIN

RESOURCES

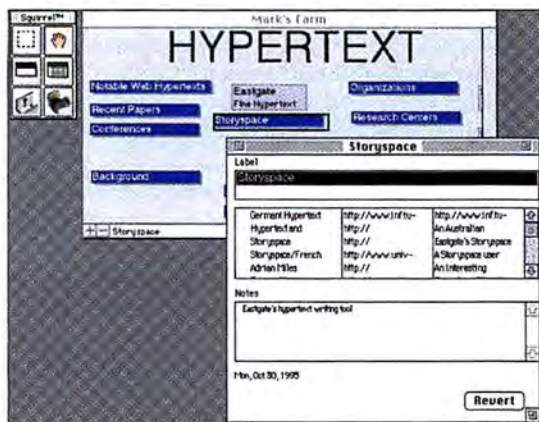
▼ **Solar System Explorer.** Using the most recent NASA data, interactively map and execute your own interplanetary flights. Launch probes, tour



Image Alchemy PS 2.1. This PostScript utility handles batch processing for image conversion and compression for more than 75 file formats and variations. \$495. Handmade Software: 800-358-3588 or 510-252-0101; <http://www.handmadesw.com/>. /BROOKE C. WHEELER

Net mammals help simplify and brighten user experience.

NetGorilla automates Internet access for individual users by consolidating connection, network, and application settings in one place. Like the shareware InternetConfig, NetGorilla saves Internet-account settings and application preferences. NetGorilla can also store multiple TCP/IP and PPP configurations, as well as browser, mail, and news preferences. The initial version, due in



Although it may not perform death-defying acts of aviation, this Net-savvy Squirrel can help users fly across bookmarked Web pages.

January, supports Open Transport TCP/IP plus PPP, MacTCP, FreePPP, and MacPPP. Applications supported include Netscape Navigator, Microsoft's Internet Explorer, Qualcomm's Eudora, and John Norstad's freeware NewsWatcher. Support for other popular Internet applications will be added in subsequent versions. \$49. Rockstar Studios: 415-242-1984; <http://www.rockstar.com/>.

• Although some primates can really help the less Internet-evolved among us get our configuration acts together, others are in it only for monkeyshines. For example, the Pixel Monkey CD-ROM contains 2,000 arrows, banners, bullets, icons, and other images intended to liven up Web sites. All images are original, and the CD-ROM is available for \$29. Pixel Monkey Productions: 800-875-1666 or 617-261-4700; <http://www.pixelmonkey.com/>.

/ SHELLY BRISBIN

THE OFF BEAT

Add-ons That Make a Fashion Statement

JUST AS THE RIGHT BELT can turn an outfit from plain to smart, the right Zelco accessory can add flare to your computer. Besides being fashionable, these accessories have a job to do — the MouseTrap tidies your workspace by hugging your mouse up against your monitor; the DocumentClip substitutes for a typing stand and holds a pen or pencil; the UtilityCup can hold whatever your imagination devises; and the BudVase lets you place a posy where you can see it while you work. The accessories come in off-white to match most monitors and cost about \$13 each. Look for them in major computer stores. Zelco: 800-431-2486 or 914-699-6230; <http://www.zelco.com/>. / **NANCY PETERSON**



Online Banking to Triple in 1997

Mac users gain more options as banks move services to the Internet.

ONLINE BANKING is moving to the Internet, turning a difficult-to-access novelty into an affordable and convenient option — so much so that the CEO of CheckFree, a major electronic-bill-payment service, predicts that the number of households banking electronically will triple in 1997.

Among the factors spurring the move to online bank transactions are improved Internet security; the Integration Financial Network, a new electronic-banking alliance headed by IBM; and Intuit's OpenExchange, a set of protocols that will let banks interface with Intuit's Quicken via the Internet.

Despite the convenience of downloading transactions directly into a personal-finance program,

few Macintosh users currently take advantage of Quicken's online-banking capabilities. Only a fraction of U.S. banks support banking by modem, and only half of those support Intuit's Quicken for Macintosh. And CheckFree, which processes electronically made payments for several banks' customers, still prints out and mails 60 percent of the transactions it handles.

Intuit recently traded its private electronic-banking gateway for Quicken users, Intuit Services Corporation, to CheckFree in exchange for a stake in that company. Intuit is also planning to use OpenExchange as the primary method for connecting directly with Quicken over the Internet,

rather than via the Intuit Services Corporation. Assuming that banks move quickly to adopt the OpenExchange protocols when they become available, CheckFree said that it will continue to provide the gateway between banks and Quicken at least until mid-1997.

IBM and 15 major banks have teamed up with a different angle on Internet-based banking, forming the Integration Financial Network (IFN). According to IBM, the service

has an open infrastructure that allows member banks' customers to access their accounts via personal-accounting programs or the Net and online services. Many transactions, especially bill payment, will be streamlined, since banks have direct access to one another. For instance, if your phone company keeps its account at an IFN bank, your payment from a member bank can be credited directly. The network should also make online banking more affordable for smaller banks, which can license IFN for their online-banking services.

Many banks have already moved their online-banking services to the platform-agnostic Internet or are about to, a decision that bodes well for Mac users, who have previously received support from only a limited number of online-banking services. Bank of America, for instance, lets Quicken users download their recent transactions over the Internet as Quicken Interchange Format (QIF) files, which Mac users can easily import into the personal-finance application. Several banks, such as NationsBank, that have online-banking services only for Windows users will make their services available for Mac users in 1997.

Online banking has also become considerably less expensive and more convenient. In 1991, online banking was largely nonexistent. Instead, cutting-edge computer users could make up to 20 payments a month electronically by subscribing to CheckFree directly at \$9.95 per month — writing checks that often ended up being delivered by mail anyway. Today, bank customers can pay their bills, or even receive them, directly through their bank for only about half of CheckFree's price, with CheckFree operating mostly as a processing service for banks. Simply having access to recent transactions via modem is free with many accounts or is available for a negligible fee — one that may disappear if IFN's shared-cost-and-technology strategy takes off. / CAROLYN BICKFORD

THE COST OF ONLINE BANKING

BANK	PLATFORM	ONLINE-BANKING CHARGES	ELECTRONIC BILL PAYMENT
Bank of America 800-363-2432	Mac and Windows	\$6.50/month for unlimited connections and transactions*	Included with online banking
Chase Manhattan 800-242-7324	Mac and Windows	\$2.95/month, 12 connections*	Included with online banking
Citibank 800-446-5331	Windows	free	free
NationsBank 800-990-9633	Windows	free	\$5.95/month for 20 transactions
Wells Fargo 800-423-3362	Mac and Windows	free	\$5/month for 25 transactions

*Free with some accounts.

CD-ROMS

Revenge of the Turkey-Monkey

CALL THE SPCA: A wrathful bird, a wisecracking dog, and a genetic experiment have escaped and are trying to make their way to your Mac!

THE CROW: THE COMPLETE INTERACTIVE COLLECTION. After sitting through old, tired factoids about the Crow comic-book series, the movies, and the careers of both movies' stars and after watching out-of-context film clips, you'll be wishing the vigilante with the avian spirit guide had just stayed dead. This CD-ROM's Web links are almost as tiresome as the drained-dry story. \$39.95. Graphix Zone: 800-828-3838 or 714-833-3838; <http://www.gzone.com/>.

WISHBONE. Helping PBS' cocky dog — wearing Roman armor — re-create Odysseus' journey was a bit much for us, but then this title is aimed at

6-year-olds who've outgrown Barney the dinosaur. To its credit, this CD-ROM gives access to additional information through some excellent Web links. \$39.95. Palladium Interactive: 415-464-5500; <http://www.palladiumnet.com/>.

DEVO PRESENTS ADVENTURES OF THE SMART PATROL ▶. In this demented, surreal, adult game, you meet bizarre, rambling characters, including the members of the '80s New Wave band Devo. You also get to battle an evil corporate entertainment monopoly and hunt down the Turkey-Monkey, a laboratory-created monster with the body of a plucked turkey, a helmet-encased simian head, and a nasty habit of spurting green slime. \$39.95. Inscape: 800-693-3253 or 310-312-5705; <http://www.inscape.com/>. / CAROLYN BICKFORD



NEW & NOTABLE

RESOURCES

ArtPattern Vol. 1. The exquisite ornamental Asian patterns in this collection are vector-based, and they ship in PICT, TIFF, and Adobe Illustrator 3.0 file formats. The patterns can be mapped onto 3-D objects or tiled onto backgrounds. \$199. ArtMedia: 612-866-2094; <http://www.summitpoint.com/artpattern/>.

Kyoto Gardens. A graceful application of Apple's QuickTime VR technology, Kyoto Gardens lets you take a virtual stroll through 24 Zen gardens in Japan. Soothing music and background information help make your tour a truly Zen experience. \$49.95. Lunaflora: 714-970-7412; jimfitz@delphi.com.

Live Picture XT 1.0. Manipulate high-res images in QuarkXPress without pixelation or image degradation. This XTension's features include color-separation abilities and batch conversion for many file formats, including Photoshop and Photo CD. \$195. Live Picture: 800-724-7900 or 408-464-4200; <http://www.livepicture.com/>.

Xdream. One of ten XTensions from Vision's Edge, Xdream is a collection of more than 24 utilities for QuarkXPress. The DreamPad palette houses the 24 utilities and gives one-click access to color- and text-manipulation tools and to grids, style sheets, and more. \$99. 800-983-6337 or 904-386-4573; <http://www.xtender.com/>.

Stencil II! This Macintosh-only product has predrawn stencils for use in space planning, landscaping, PERT and Gantt charts, storyboards, floor plans, wiring diagrams, and so on. You can hyperlink drawings to nest them and show levels of detail. Included free of charge is Web It!, a utility that converts graphics to GIF and JPEG files for the Web. \$99. Kaetron Software: 800-938-8900 or 713-298-1500; <http://www.kaetron.com/>.



▲ **New Moon Image Library Vol. 1.** This volume of four CD-ROMs, showcasing one artist per disc, contains 3-D images, textures, photos, and original digital compositions. \$99 per CD-ROM. Hands-on Interactive Publishing: 314-241-6966; <http://www.handsoninc.com/>. / BROOKE C. WHEELER

FIRST LOOKS

The 162-MHz Newton: The MessagePad 2000 Blows the Doors off Its Predecessors

WHAT IF WE SAID that for under \$1,000 you could get a 162-MHz portable computer that had a built-in Web browser, Internet e-mail client software, a word processor, spreadsheet software, a day planner, a contacts file, and a note taker, plus it weighs 1.4 pounds and can run continuously for up to 24 hours on alkaline batteries? Now, supposing we told you it was a Newton?

Based on a 162-MHz StrongARM CPU (a low-power RISC processor jointly developed by Apple, Digital Equipment, and ARM), the MessagePad 2000 operates ten times as fast as its predecessor, the MessagePad 130. What is perhaps more impressive is that this speed boost doesn't mean a tenfold cost increase: The 2000, complete with a larger backlit screen (480 x 320 pixels, capable of displaying 16 shades of gray), two Type II PC Card slots, an internal modem slot, 1 MB of system RAM, and 4 MB of storage RAM, will sell for under \$1,000 when it ships in the first quarter of 1997. The 130's price was recently reduced to \$699.

At first glance, the 2000 doesn't look all that different. It's still too big to fit in a shirt pocket, although five 2000s weigh less than one PowerBook 1400. And, unlike its more dramatic-looking sibling, the 2000 doesn't have an integrated keyboard, although at least one configuration will include a book-style carrying case with a keyboard.

However, a closer inspection reveals several improvements. The Button Bar, for example, is no longer silk-screened on the display; instead, a user-configurable Icon Bar gives users quick access to almost any icon in the Extras drawer.

Other enhancements include the Newton Interconnect, a thin, high-speed port that offers serial, LocalTalk, power, and audio in/out connections. The 2000 is the first Newton to come with a mic that can be used with new audio stationery to record sound. Unfortunately, an hour of good-quality audio takes up an entire 4-MB storage card.

Unlike past MessagePads, the 2000 will come bundled with all the software a mobile professional needs to get productive right away. This includes the NewtonWorks word processor; PelicanWare's Excel-compatible spreadsheet program, Quick-Figure Pro; Net Strategy's EnRoute i-NET Internet e-mail client; Newton Connection Utilities for Mac and Windows; and NetHopper, a Newton-based Web browser. The version of NetHopper we tested



The Clark Kent of PDAs: Don't let the MessagePad 2000's mild-mannered appearance fool you. Behind its plain exterior beats its 162-MHz StrongARM heart.

didn't support tables, frames, or graphics, although Apple said the version that will ship with the 2000 will have limited support for all three.

Before testing the 2000, we generally described Newtons as data peripherals — convenient devices for taking desktop-computer data with you on the road. However, with this new MessagePad, the Newton platform has at last grown up. The 2000 offers many advantages over other portable computers — such as its lower price, light weight, and excellent performance — and supplies enough functionality to satisfy many, if not all, mobile users. It also improves significantly on those things uniquely Newton — offering faster, more accurate handwriting recognition — and adds to them functions such as text-to-speech and, in the not-too-distant future, voice recognition. With this combination of value, functionality, and ease of use, the 2000 could prove to be the MessagePad that really gets the Newton going. / ANDREW GORE

PROS: Blazing speed, good price, bigger screen, more expansion options, lots of good-quality bundled software.

CONS: No integrated keyboard, too big to be a pocket computer.

INFO: Under \$1,000. Apple: 408-996-1010; <http://www.newton.info.apple.com/>.

eMate 300 Goes to Head of the Class:

Funky New Newton Offers Cool Design for the Classroom

WHEN IS A POWERBOOK not a PowerBook? When it's the eMate 300, Apple's first Newton made specifically for the education market.

Selling for under \$800 (unit costs drop significantly when the eMate 300 is bought in packages of eight or more), the eMate costs less than a fourth of what a fully equipped PowerBook sells for. According to Apple, the education market has been interested in portable computing for years but wasn't prepared to invest the funds required to buy notebooks.

Offering more than just price, the eMate is Apple's first serious effort to engineer a product to address the special needs of a market. The nearly indestructible ABS plastic shell, for example, is designed to take the kind of abuse only a fifth-grader can dish out. The chassis also features a whimsical design — it looks like something straight out of a *Batman* movie — sure to appeal to image-conscious grade-schoolers.

Perhaps more important is the ease of use the Newton OS offers. Unlike a Windows- or Mac OS-based portable, the eMate has no hard drive and, therefore, offers considerably faster boot times. Also, because the application is the interface in the Newton OS, students don't have to work with a file-based metaphor to get work done. And what could be more intuitive to the finger-paint crowd than the ability to draw directly on the screen?

Compared to the MessagePad 2000, the eMate is slow, with only a 25-MHz ARM 710a processor. However, it's still two to three times as fast as the MessagePad 130. It comes equipped with only one Type III PC Card slot, and it has only 3 MB of built-in storage RAM. To its credit, the eMate does offer an internal-memory slot that can be used to increase storage RAM or expand the built-in system RAM from 1 MB up to a whopping 4 MB.

The eMate comes standard with a nickel metal hydride battery pack that Apple claims can power the portable for up to 28 hours of continuous use.

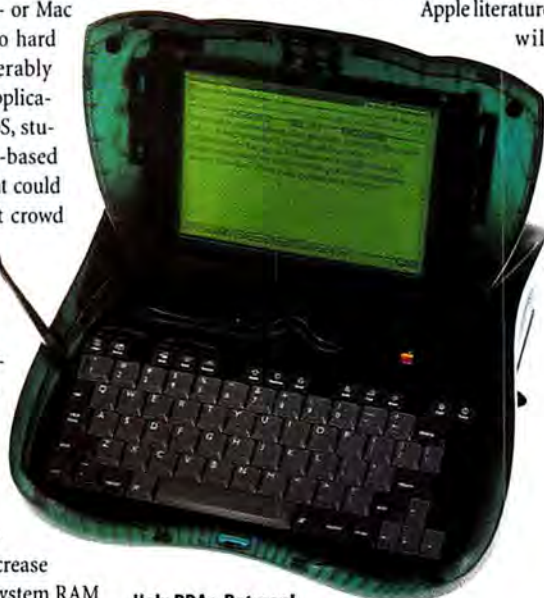
Its screen has the same resolution as that of the 2000 but has fewer pixels per inch. This results in a larger, more readable display.

The integrated keyboard, a first for a Newton OS-based device, is tightly packed and has a somewhat atypical layout. The up-arrow key, for example, sits to the left of a small Shift key. Overall, the keyboard's action is good, but the layout requires some getting used to.

The eMate's software bundle is as robust as the 2000's and even includes a more-full-featured version of NewtonWorks (the eMate version comes with a draw module). It also has a special version of the Newton Connection Utilities, called Classroom Connection, that allows teachers to update data on a roomful of eMates from one computer.

In its effort to demonstrate just what could be done with market-focused design, Apple has created a Newton that blows away just about all the PDA stereotypes — including weight (the eMate weighs a hefty 4 pounds). In fact, nowhere in any

Apple literature will



Holy PDAs, Batman!
The New Newton OS-based eMate 300 offers students a cheap, easy-to-use mobile-computing solution that's especially designed for education.

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of October 11, 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)	•	\$275
LC III (4/80)	•	\$225
Performa 5215CD (8/1GB)	•	\$1,200
Performa 6220CD (16/1GB)	•	\$1,100
Ilisi (5/80)	•	\$225
Ilisi (4/80)	•	\$250
Ilifx (4/80)	•	\$300
Quadra 610 (8/160)	•	\$425
Quadra 630 (4/250)	•	\$575
Quadra 650 (8/230)	•	\$625
Quadra 800 (8/230)	•	\$850
Quadra 8400x (8/230/CD)	•	\$1,100
Quadra 950 (8/230)	•	\$975
Power Mac 6100/66 (8/350/CD)	•	\$750
Power Mac 7100/80 (8/700/CD)	•	\$1,075
Power Mac 7200/90 (8/500/CD)	•	\$1,100
Power Mac 7500/100 (16/1GB/CD)	•	\$1,650
Power Mac 8100/100 (16/1GB/CD)	•	\$1,600
Power Mac 8500/120 (16/2GB/CD)	•	\$2,400
Power Mac 9500/132 (16/2GB)	•	\$2,475
PowerBook 165c (4/80)	•	\$825
PowerBook 180 (4/120)	•	\$750
PowerBook 190cs/66 (8/500)	\$1,199	\$1,100
PowerBook 520c (4/160)	•	\$975
PowerBook 540c (4/320)	•	\$1,650
PowerBook 5300cs (8/500)	•	\$1,700
Duo 250 (4/200)	•	\$625
Duo 280c (4/320)	•	\$1,150
Duo 2300c/100 (8/750)	\$1,699	\$1,550
Power Computing Power 100 (16/1GB/CD)	•	\$875
Power Computing PowerWave 604/150 (8/1GB/CD)	•	\$2,000

• = 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, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC :MACUSER).

you see the term PDA. It seems the days of unfocused Newton marketing have died, along with underpowered, overpriced Newtons.

The eMate 300 is a high-style, inexpensive portable well suited to the mobile-computing needs of the education market. About the only serious mistake Apple made was underestimating the eMate's potential appeal. At under \$800, we predict a healthy trade in black-market eMates developing within weeks of the first unit shipment, sometime in the first quarter of 1997. / ANDREW GORE

PROS: It's cheap. It's got a nice screen. It offers good out-of-the-box functionality. And its semitransparent, shapely chassis is way cool!

CONS: Underpowered. Nonstandard keyboard layout. Only one PC Card slot.

INFO: Under \$800. Apple: 408-996-1010; <http://www.newton.info.apple.com/>.

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"The Mac is not a religion, it's just a very good computer. Maybe once [that] idea sinks in, the Mac platform can grow once again."

— Dave Winer, on DaveNet (<http://www.scripiting.com>)


/davenet/96/09/BeeStories.html


Fonts of Wisdom


WE TEND TO TAKE FONTS for granted — they sit in the System Folder and appear like dutiful little soldiers when we call on them. But what if your fonts stage a revolt? All manner of system errors, freezes, and crashes can be caused by corrupted fonts, and duplicate fonts take up precious disk space and hog your RAM. The following shareware tools — available from MacUser's Software Central (<http://www.zdnet.com/macuser/software/>) or at keyword MACUSER on AOL — will keep fonts in line and catalog your growing collection:

 Robert Chancellor's \$20 **Font Clerk** (★★★★) displays fonts in a range of point sizes, converts fonts between Mac and Windows TrueType formats, creates new font suitcases, exports font lists, and gives a wide range of font information. You can check your system fonts and temporarily load other fonts or suitcases.



 If you don't know what fonts you have and what they look like, Peter Welch's \$5 **FontScan** (★★★★) can scan your System Folder or any other folder you designate and print a document containing a display of each font it finds. You choose the point size and the display text. It can handle up to 500 bitmapped, TrueType, or PostScript (Type 1) fonts.

 When you collect numerous fonts, you are able to install only a portion at a time. An application such as Ed Hopkins' \$10 **Font Manager** (★★★★) enables and disables fonts, much as Apple's Extensions Manager does for your extensions.

 If you really need help, Insider Software's **Font Box** (★★★★) can perform a complete analysis of your font collection and repair or remove corrupted fonts for you. It can also slim down your fonts folder by removing duplicate fonts and unnecessary point sizes. If you're having any font problems, this is the tool to try. There are several versions (one of which works on networked volumes), available at various costs.

/ JODI NAAS

MACUSER UTILITY OF THE MONTH

A Thumbnail View of the Web

FLUSH WITH THE SUCCESS of our special free offer of Now Software's Now Startup Manager 7.0, this month MacUser is presenting another free utility from a commercial software vendor.

Extensis CyberViewer is an add-on utility for Netscape Navigator that automatically monitors your activity on the Web. Like MacUser's own Web Ninja, it keeps track of where you go and when you were there — but it also does something unique: It saves thumbnail images of

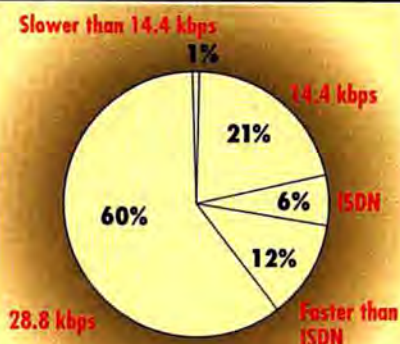
the pages you've visited, so you can recognize sites at a glance instead of from a cryptic Web address. For a limited time (through December 20),

Extensis CyberViewer will be available for free exclusively from Extensis' own Web site (<http://www.extensis.com/>) as well as MacUser's Software Central on the Web (<http://www.zdnet.com/macuser/software/>), America Online (keyword MACUSER), and CompuServe (GO ZMC:MACUSER).



ONLINE POLL

Q. How fast is your connection to the Internet?



To participate in MacUser's online polls, go to <http://www.zdnet.com/macuser/poll.html>.

MACUSER AOL-CHAT CALENDAR

DATE	TIME	EVENT
December 5	8 P.M. EST	Web Servers and Web Publishing
December 12	8 P.M. EST	Christmas Buying Guide with the MacUser editors
December 19	8 P.M. EST	Help Folder: Your Mac Problems Solved
December 30	8 P.M. EST	Game Tips with Roman Loyola

All events will take place on America Online. Times and guests are subject to change. For up-to-date event information and locations, check out keyword MACUSER or <http://www.zdnet.com/zdi/talk/talkcal.html>.

MACUSER ONLINE

Web: <http://www.macuser.com>
AOL: keyword MACUSER
CompuServe: GO ZMC:MACUSER
 Send letters to the editor to letters@macuser.com.
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REVIEWS

Mac OS Systems

**UMAX SuperMac S900
604e/225**



**UMAX SuperMac S900
604e/200**



**UMAX SuperMac S900
604e/180**



**UMAX SuperMac J700
604/150**



UMAX broadens tower line,
introduces desktop system.



UMAX COMPUTER, broadening its Mac OS clone offerings, has added three new models to its flagship line of SuperMac S900 tower systems and rolled out its first system in a horizontal desktop-style case, the SuperMac J700 604/150. All are competitively priced and share thoughtful design touches that characterized UMAX's earlier Mac OS-system offerings. One — the SuperMac S900 604e/225 — boasts the fastest chip available today in a Mac OS system. Unfortunately, the UMAX design hopelessly cripples that high-speed chip — and limits the speed of the other new systems.

New Towers Loom

The three additions to the SuperMac S900 tower line, the 604e/225, the 604e/200, and the 604e/180, are all built around powerful latest-generation PowerPC 604e-class processors, running at respective clock speeds of 225, 200, and 180 MHz. They share the same case design as UMAX's previous tower models, with six PCI expansion-card slots (one of which is occupied by the supplied IMS TwinTurbo 128M graphics card, with 4 MB of onboard video RAM) and room for a total of seven internal drives (including the built-in IBM

2-GB hard drive, 8x CD-ROM drive, and floppy drive.

The new S900 models, like their predecessors, also have UMAX's unique — and still unproven — second-processor slot. When UMAX rolled out its original S900 system last spring, it promised to follow up with an expansion card that would add a second processor. The card still hasn't arrived, although UMAX offers assurances that it's right around the corner. If or when this card appears, it promises to be a boon to Photoshop users, 3-D designers, and digital-effects artists, who depend heavily on processor-intensive tasks — and has the potential to be a cost-effective alternative to replacing a single-processor card with a dual-processor one, as would be required in current Apple and Power Computing system designs.

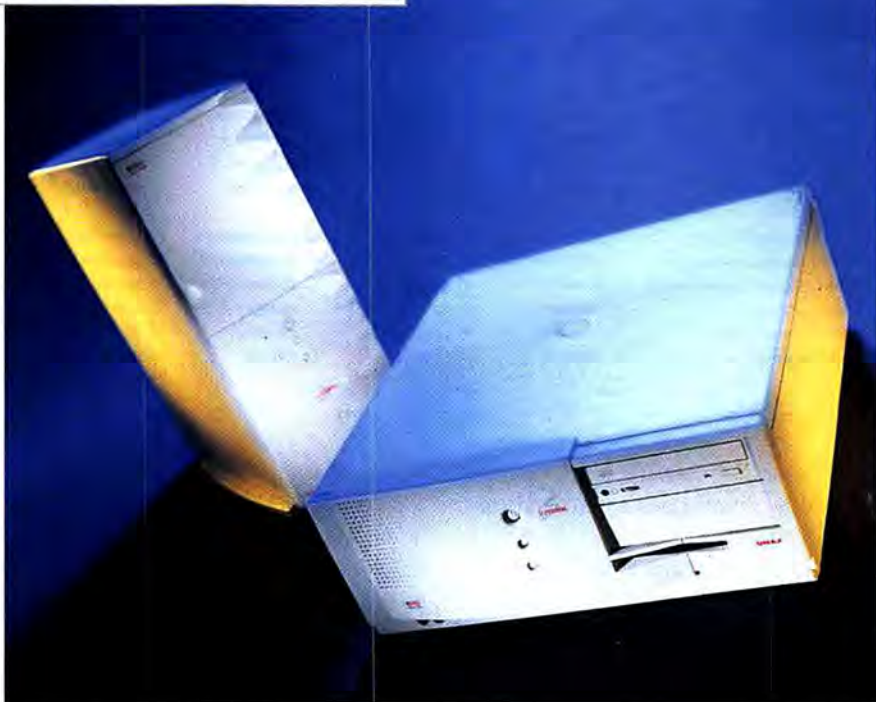
Also still under development is a second expansion card that UMAX promised at the S900 introduction: Code-named Gemini, it promises 100BASE-T Fast Ethernet and Ultra SCSI on a single card.

The S900 case is rugged

and well designed, with thoughtful enhancements compared to that of the Apple Power Mac 9500, which has the same basic logic-board design: Front-panel microphone and headphone jacks (in addition to the standard back-panel jacks) are a genuine convenience, for example, as is a second ADB port, which allows use of multiple dongles (hardware security) without cluttering the main keyboard/mouse ADB chain. (The towers also share one design trait that's mildly but persistently annoying: a plastic door that covers the drive bays and has a knack for getting in the way of the CD-ROM tray. UMAX's manual provides instructions on removing it — we advise users to find and use them as soon as possible.)

In the SuperMac S900 604e/225, UMAX offers the fastest processor you can buy for running the Mac OS. Disappointingly, it traps the

superfast chip in a box that never lets it run full-tilt: The S900 logic board's meager 512K of Level 2 (L2) cache memory stifles the 225-MHz chip's speed, so that the S900 604e/225's scores on our MacBench 3.0 tests are practically identical to



REVIEWS RATING KEY

★★★★★	OUTSTANDING
★★★★	VERY GOOD
★★★	ACCEPTABLE
★★	POOR
★	SERIOUSLY FLAWED
●	DANGEROUS



SHAVING OFF THE TOP / how the new SuperMacs stack up

Our comparison of the new entries in UMAX's SuperMac S900 line with same-processor systems from Apple and Power Computing reveal that the 200-MHz and 225-MHz PowerPC 604e-based S900s fare poorly against their rivals because of limited Level 2 cache. By contrast, the PowerPC 604-based J700 offers a

good value when compared with its competitors, the Apple Power Mac 7600 and the Power Computing PowerCenter 150. MacBench 3.0 scores are relative to those of an Apple Power Mac 6100/60 with an internal 250-MB Quantum hard drive and an internal 2x CD-ROM drive, which is assigned a score of 10 on all tests.

MACBENCH 3.0 SCORES

	Processor	Floating Point	Disk Mix	Publishing Disk Mix	Graphics Mix	Publishing Graphics Mix	CD-ROM Mix
UMAX SuperMac S900 604e/225	42	49	33	18	92	86	34
UMAX SuperMac S900 604e/200	41	44	33	18	91	85	34
UMAX SuperMac S900 604e/180	38	40	35	19	89	82	32
UMAX SuperMac J700 604/150	31	30	31	18	47	37	37
REFERENCE SYSTEMS							
Power Computing PowerTower Pro 225	48	49	42	22	141	90	110
Power Computing PowerTower Pro 200	47	44	41	22	141	90	111
Power Computing PowerTower Pro 180	42	39	42	21	137	86	115
Apple Power Mac 9500/200	41	44	25	17	67	49	23
Apple Power Mac 8500/180	34	40	27	17	34	30	23
Power Computing PowerCenter 150	31	30	23	16	30	34	29
	SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER

those for the S900 604e/200, which runs at an 11-percent-slower clock speed (and costs about \$500 less). Even worse, the S900/225 system's L2 cache module is soldered onto the motherboard — not mounted in an expansion slot as in Apple and Power Computing designs — so there's no way to give the 225-MHz chip the headroom it needs.

The L2-related constraints aren't limited to the S900 604e/225, either, as demonstrated by a comparison of MacBench results for the UMAX systems with same-processor counterparts from Power Computing. Power's PowerTower systems ship with a 1-MB L2 cache, and the larger cache boosts speed so significantly that the PowerTower Pro 180, based on a 180-MHz PowerPC 604e processor, not only outruns its same-processor UMAX counterpart, the SuperMac S900 604e/180, but also essentially matches the speed of the faster-clocked SuperMac S900 604e/200 and 604e/225. Comparably outfitted PowerTower Pro 200 (\$4,615) and 225 (\$5,115) systems from Power Computing are significantly faster than any shipping UMAX systems. They're also considerably more expensive, but professionals who need them will probably be willing to pay for the extra speed.

Although processor speed is the most noticeable area in which the new UMAX systems lag behind their rivals from Power Computing, the SuperMac graphics subsystems also score lower on our MacBench tests than those of Power's top-of-the-line offerings. For instance, the SuperMac S900 models and Power's PowerTower Pro systems ship with IMS TwinTurbo 128M graphics cards, but

Power's systems, which each have a card with 8 MB of video RAM, score significantly better in our MacBench Graphics and Publishing Graphics Mix tests. (As this article went to press — too late for us to retest — UMAX announced that it is replacing the 4-MB version of the IMS card with an 8-MB version in its S900 604e/225 systems.)

Desktop Design Debuts

The first in what promises to be a series of desktop systems, the J700 line, is the SuperMac J700 604/150. Built around a 150-MHz version of the older, less powerful PowerPC 604 chip, the J700 ships standard with 16 MB of RAM and offers three PCI expansion slots and room for two additional internal SCSI drives.

The J700 lacks the second processor slot found in the S900 models, and also unlike those models', its processor card is not upgradable. It ships with a 512K Level 2 cache soldered onto the motherboard, but this is far less a hindrance with the older, slower 150-MHz PowerPC 604 chip than it is with the fast new PowerPC 604e-class processors.

It offers significantly higher speed than Apple's similarly priced Power Mac 7600/132 and far better disk- and graphics-subsystem performance than Power Computing's less expensive PowerCenter 150 — the only other shipping system based on the 150-MHz PowerPC 604. The J700 604/150's speed for general business tasks is perfectly respectable, and although its 2-GB hard drive and IMS TwinTurbo graphics card with 2 MB of video RAM won't suffice for Photoshop pros, it does

let you work at millions of colors on a 17-inch monitor and does meet the publishing needs of small-business users who want to prepare occasional flyers and newsletters.

The Bottom Line

The system design of the SuperMac S900 line is generally very good, with several well-considered conveniences, and the prices are appealingly competitive with those of comparable models from Apple and even from price cutter Power Computing. But as ever faster PowerPC chips are rolled into the S900 line, the inability to expand the Level 2 cache beyond 512K has become a critical flaw. The cache limit stifles the speed of fast chips, as demonstrated by comparing speed-test results for the UMAX systems with those of same-chip systems from Power Computing. The S900 604e/180, which suffers least from this limitation, is a pretty good value. The S900 604e/225, however, is a sad case of crushed potential: It fares no better on most speed tests than its more affordable, lower-clocked cousin, the S900 604e/200.

UMAX's SuperMac J700 604/150, although based on the now aging PowerPC 604, is a fine general-purpose office computer that compares favorably to rival offerings from Apple and Power Computing. / Jim Shatz-Akin

UMAX SuperMac S900 604e/225 (32MB/2GB/8x CD-ROM), \$4,495; **UMAX SuperMac S900 604e/200** (32MB/2GB/8x CD-ROM), \$3,995; **UMAX SuperMac S900 604e/180** (32MB/2GB/8x CD-ROM), \$3,795; **UMAX SuperMac J700 604/150** (32MB/2GB/8x CD-ROM), \$2,995 (list). **Company:** UMAX Computer, Fremont, CA; 800-286-6186 or 510-651-4000; <http://www.supermac.com/>. **Reader Service:** Circle #401.



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QuarkImmedia



Bridge the gap from page design to multimedia authoring.

CREATING INTERACTIVE CONTENT is a world apart from designing projects for paper, and nothing brings home that point more than QuarkImmedia, the first foray into interactive authoring by the maker of page-layout titan QuarkXPress. QuarkImmedia piggybacks on QuarkXPress to harness its familiar interface as a front end to interactive authoring for CD-ROMs, kiosks, and the Internet. As a result, it offers an effective way for designers to make the transition to multimedia, but simply knowing how to use QuarkXPress isn't enough to help you master the intricacies of QuarkImmedia.

QuarkImmedia is an XTension for QuarkXPress 3.32, but as its hefty documentation suggests, it has all the complexity of a stand-alone application. And there's no getting around reading the manuals, even if you know QuarkXPress backward and forward. Yes, you do make use of QuarkXPress' familiar frame-creation and -editing tools to make and modify text and graphic elements, but after a while, you become so immersed in QuarkImmedia's unwieldy interface that you may forget to use QuarkXPress commands for simple actions, thinking instead that the answer must be lurking in one of QuarkImmedia's many menus. Conversely, QuarkXPress-learned behaviors may not solve some multimedia problems.

It takes a while to understand QuarkImmedia's logic, but once you get the hang of it, creating complicated projects becomes pretty straightforward: QuarkImmedia pages serve as scenes in your interactive project. You use QuarkXPress to place text or graphic boxes on each page, and then you invoke QuarkImmedia (from QuarkXPress' View menu) to add interactivity.

You use QuarkImmedia's Object menu to define page elements as windows, movies, animations, pop-up menus, or any of several

types of text fields. Once you've defined any element as a QuarkImmedia object type, you can assign it basic interactive properties via the Event or Script menus. As you'd probably guess, the Hot Text menu creates hyperlinks, the Keys menu governs command keys, and the Page menu lets you move between pages.

Event-menu commands trigger any of 17 preset actions, such as turning pages, playing animations or movies, and invoking pop-up menus. You specify the type of user activity that initiates a given action (double-click, cursor rollover, and so on), choose a cursor, and then select the appropriate action from a pop-up-menu. You can specify sound effects and visual transitions to accompany these actions.

Truly complicated actions are best done with QuarkImmedia's scripting language. To create a script, you essentially cobble together



QuarkImmedia's tabbed palette groups tools logically in six work areas, but it isn't resizable and it takes up too much screen space. We hope Quark will correct this in the next version.

the actions from the Event area. For instance, you can create a simple script to open a hidden window, play a movie to completion, and then hide the window again. It's not super-sophisticated, but we were able to do what we wanted with minimal hassle. For many projects, QuarkImmedia's scripting will prove more than adequate.

Like other multimedia-authoring programs, QuarkImmedia requires you to plan your work for best results, and in QuarkImmedia, backtracking can be difficult. On several occasions, we accidentally deleted a script or event and were dismayed that QuarkImmedia gave us no second chance — no warning dialog box, no undo command. And because most events are related, deleting one event can mean lots of reconstruction.

Assembling a multimedia project requires so much more than the text and graphics

QuarkXPress users are accustomed to, and QuarkImmedia attempts to fill the gaps. It ships with a simple button maker for creating customized navigation and playback buttons, but it's too crude to be much help. More useful is the MenuMaker option, which lets you define long lists of items to be added to either a pop-up menu or to the menu bar of your project. This capability is handy for creating catalogs and for adding URLs to a project.

You preview your project by issuing QuarkImmedia's Engage command. You can opt to display a debugging window, but unless you've got a second monitor, it's not all that useful. When satisfied with your work, you export the file as a QuarkImmedia project. Quark provides several export options, which chiefly differ in the way they handle the player you need in order to view QuarkImmedia projects: You can embed the player in a single QuarkImmedia document (adding a megabyte to the file size), keep the file and the player separate (good for CD-ROM use), or break the file into multiple pieces for segmented Internet downloads.

Despite this nod toward the World Wide Web, QuarkImmedia isn't as Internet-ready as it should be. Adding URLs to a project is easy enough, but the QuarkImmedia player's requirement that you view Web pages in a proprietary window — separate from your document page — is cumbersome. Quark is preparing a plug-in for Netscape Navigator and Microsoft Internet Explorer that should help.

The Bottom Line

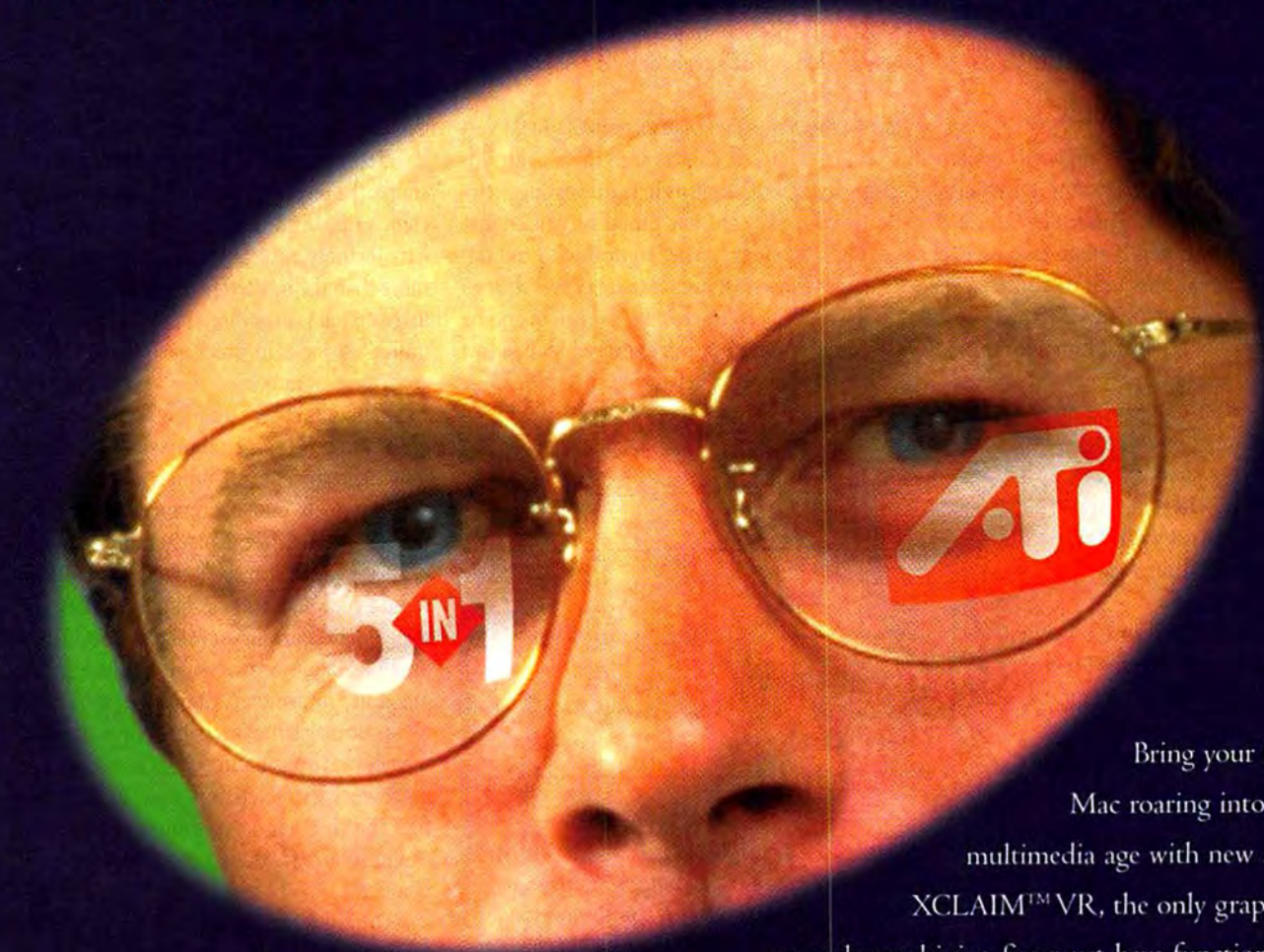
QuarkImmedia has two chief drawbacks. The first concerns the product itself: QuarkImmedia purports to leverage your QuarkXPress expertise, but in reality, you must learn lots of new commands, menus, and skills.

QuarkImmedia's second problem is subtler: The program succeeds admirably in making multimedia development approachable for traditional publishers and page designers, but it takes far more than understanding of text and graphics to generate good interactive content — and the page-layout metaphor isn't always suitable. The XTension provides page designers with a nice introduction to assembling projects, but unless you're a QuarkXPress user who can pay QuarkImmedia's steep price, you should probably stick with what you already have. / Pamela Pliffner

QuarkImmedia 1.0, \$995 (list). **Company:** Quark, Denver, CO; 800-676-4575 or 303-364-5735; <http://www.quark.com/>. **Reader Service:** Circle #402.

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Finance Managers

Quicken 7.0



Quicken Deluxe 7.0



Update significantly improves popular financial tool.

JUDGING BY HIS advice to David Copperfield (the original, not the smarmy magician), Mr. Micawber would have understood the appeal of Intuit's Quicken: "Annual income twenty pounds, annual expenditure nineteen nineteen six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery." Quicken 7.0, the most recent version of the ultrapopular personal-finance software, can't guarantee Micawberian happiness, but at least you'll know which six shillings caused your misery.

With the release of version 7.0 (particularly the CD-ROM-based Deluxe version, which retails for an extra \$20), Intuit is taking aim at the billions of dollars Americans pour into retirement investment accounts, such as 401(k)s, every year. Besides streamlining checkbook balancing, Quicken can now help you figure out how to put your kids through college or to retire with a comfortable income. If you're lucky, maybe you'll figure out how to do both.

Basic Improvements

For those who have yet to join the legions of Quicken converts, Intuit has made the program's interface even easier to use and better-documented, with improved online help and (unlike in version 6) a user manual. A new palette interface organizes Quicken into "activity areas" (Banking, Investing, Assets/Debt, Planning, and Reporting), and you can switch easily among them. When you do so, Quicken's tool bar changes to give you tools appropriate to that area. Likewise, open windows appear only for the area from which you opened them — reducing on-screen clutter. The default interface also now cleverly hides

the Finder behind a backdrop — making it harder for Mac novices to accidentally click into the Finder.

Other improvements are subtle yet effective. For instance, split transactions can now open and close automatically (this isn't a default — you must ask for it in preferences). A handy calendar pop-up simplifies date entry, and it's possible to sort a register by date or by check number.

Where the non-Deluxe, non-CD-ROM version of Quicken 7.0 has seen the biggest improvements, though, is in the Investing activity area. You can now group securities into "lots," making it easier to deal with capital-gains issues (just in case that tax ever *does* go down). You can track high/low prices and be alerted when stock prices exceed high or low marks you've set ("tell me when Apple's stock

experience since it became available last February, online banking does work, so if your bank doesn't charge extra for it, by all means sign up. It's especially appealing to two very different types of users: those who don't want to bother entering their own transactions and those who want to monitor their account balances on a daily basis.

Beyond the Basic

Quicken 7.0 is worth the estimated \$20 to \$30 it will cost previous users to upgrade from version 6; the investing features alone offer sufficient value. And Quicken Deluxe 7.0, which lists for only \$20 more, has improved even more than the basic version. Further, the Deluxe version is now thoroughly integrated — unlike version 6, in which each module was a separate program.

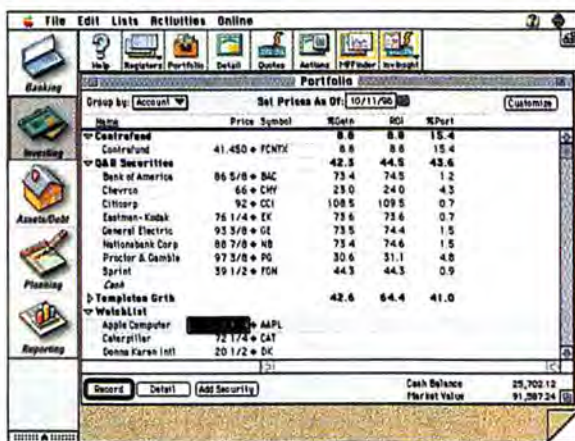
Thankfully absent from Quicken Deluxe 7.0 are version 6's forgettable Ask the Experts movies. In their stead, Intuit has created several extremely valuable financial worksheets that enable you to calculate your net worth, evaluate your retirement-savings plan, and reduce your debt (better than Micawber, one hopes). These are far more sophisticated than anything in previous versions of Quicken and are easier to use than similar worksheets in books or magazines, in part because most of the relevant information is automatically and ingeniously extracted from your Quicken data file. The final report is similar to what you would receive if you were to hire a financial planner.

As for the other Deluxe features, version 6's Mutual Fund Finder remains pretty much unchanged. A major disappointment is the new Investor Insight feature, which offers news and current and historical stock quotes from the Internet for as many as 500 securities, for \$9.95 a month. Unfortunately, deleting downloaded data files after you've read them can literally take hours. Intuit considers this a bug and is targeting it for a fix in a future update.

The Bottom Line

Quicken 7.0 has only one serious competitor in the Mac personal-finance arena: previous versions of Quicken. And this time around, it has managed to top itself yet again. Result happiness. / James Bradbury

Quicken for Macintosh 7.0, \$39.95; **Quicken Deluxe for Macintosh 7.0**, \$59.95 (list). **Company:** Intuit, Mountain View, CA; 800-624-8742 or 415-944-6000; <http://www.qfn.com/>. **Reader Service:** Circle #403.



Quicken 7.0's new activity areas and context-sensitive tool bars aid in navigating the program's many tools; the Investing area's Portfolio window simplifies performance tracking by letting you group stocks in lots.

price goes below \$17," for instance). Price graphs now show when you bought or sold shares, which can be painful or prideful information.

The number of available graphs has doubled (to ten), and the graphing options now include useful investment tools such as an asset-allocation pie chart. A welcome new graphing feature is the ability to automatically size graphs to fit on a single page. Unfortunately, graphs are still color-coded, which can make them difficult to interpret.

Finally, the basic Quicken offers improved online banking, although this is one area in which the program still has room to develop. More banks have signed up, and Intuit's recent sale of its own bill-paying service (never an option for Mac users anyway) to Check-Free should accelerate that trend. Based on our



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A GREAT REVIEW IS
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WORTH REPEATING



REPRINTS

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MacUser

FutureSplash Animator

★★★★★

Revolutionary, easy-to-use animation creator.

ANYONE DESIGNING media-rich content for the Internet must balance the desire to create compelling graphics and animation against the need to keep pages compact enough to blast across the slow connections of the typical Web-browsing audience. (Even at ISDN speeds, the Internet is relatively slow.) Although Macromedia's Shockwave animation format and expanded graphics-format support have done much to help the situation, FutureSplash Animator, from FutureWave, is perhaps the most significant development for delivering platform-independent animations over the World Wide Web. In fact, because its vector-based animated elements download far more efficiently than the bitmap-based animations of competing technologies, FutureSplash Animator may prove to be the most important graphics product yet for Web-page designers.

FutureSplash Animator is based on the easy-to-use, intelligently designed tools and technology found in FutureWave's SmartSketch drawing package, which won a 1995 *MacUser* Editors' Choice Award. Like SmartSketch, FutureSplash Animator lets you create graphics with two classes of tools: those normally available in bitmap-graphics programs, such as brushes that respond to pressure-sensitive input devices and erasers that allow you to delete only portions of a vector graphic, and those common to drawing programs, such as those for the creation of ovals, rectangles, curves, and more.

Artists who have less-than-steady hands will appreciate the smoothing tools for cleaning up imperfectly hand-drawn artwork. You can specify solid-color fills (the program comes with a 216-nondithering-color Web palette) and gradient fills (which decompress instantly over the Web). Most important for professional artists, FutureSplash Animator can import and use graphics created with such programs as Adobe Illustrator and Macromedia FreeHand, although certain features, such as PostScript patterns, are not supported.

Animation is created in a timeline-based interface that automatically interpolates changes in object size, position, and rotation across multiple frames. We'd like to see more-comprehensive animated object blending and "morphing" support, but overall these tools are well designed and highly intuitive.

The animations created by FutureSplash Animator require far less processing power than any comparable bitmap animations (such as animated GIFs). What's more, complex graphics containing many color gradients download an order of magnitude faster than their bitmapped equivalents. As a bonus, FutureSplash Animator graphics and animations stream when downloaded across the Web: Animations start to play even before a file transfer is completed, a capability not found in the current version of Shockwave.

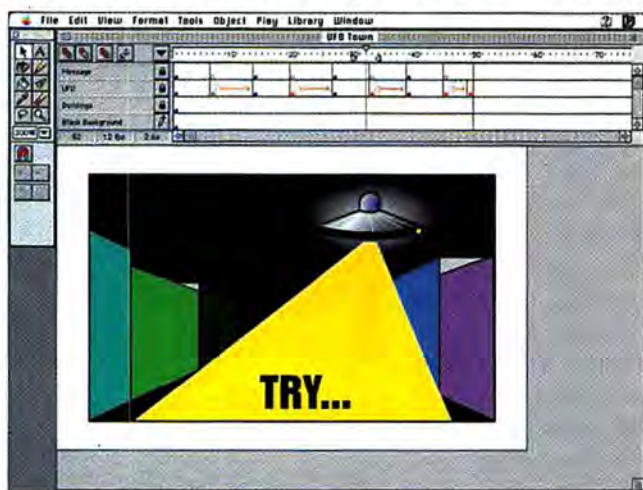
Despite its efficiency and the simplicity of its tools, FutureSplash Animator is packed with features that will please even graphics perfectionists who are turning their talents toward the Web. For example, even though the files created by FutureSplash Animator are vector-based, they appear with full anti-aliasing on the client playback machine — deriving the best features of vector and bitmapped graphics. FutureSplash Animator also converts TrueType and PostScript fonts to vector format, so you can treat them just as you would any other FutureSplash objects. That means you can create anti-aliased custom font effects such as animated decorative page titles without worrying whether the viewer of your page has your fonts installed. This capability alone is ample reason for designers to consider FutureSplash Animator.

But Wait — There's More

FutureSplash Animator makes it remarkably easy for you to create rollover effects — buttons or other objects that animate or change when you move the mouse over them — and buttons that animate when pressed. Shockwave requires you to write code to achieve these effects, but no scripting is required in

FutureSplash Animator; in fact, the creation of these sophisticated effects is effortless in FutureSplash Animator.

The program ships on a CD-ROM that includes the Mac OS version as well as versions for Windows 95 and NT. The CD-ROM includes a superb set of comprehensive tutorials — among the best we've ever seen for a graphics program. The disc also contains a decent library of prebuilt elements (called *symbols* in FutureSplash-speak). These include enough animated buttons, icons, and graphics to get you started building useful animated pages without having to do much drawing. The CD-ROM also includes the necessary Netscape Navigator and Internet Ex-



FutureSplash Animator's timeline, at the top of the screen, displays the objects that make up a scene and uses arrows to indicate their speed and direction.

plorer player plug-ins (which are also available on the FutureWave Web site, free of charge).

Notwithstanding our wish for morphing and blending capabilities, we found only one major omission in FutureSplash Animator — its inability to add sound to animations, a drawback we hope to see addressed in future versions. (Of course, adding sound would significantly increase the size of the graphics and animation files the program creates.)

The Bottom Line

All in all, FutureSplash Animator is a tool that can help your Web pages truly stand out from the rest of the Web crowd. If you're a professional designer of Web sites or pages, you need this product *right now*. / David Biedny

FutureSplash Animator 1.0, \$250 (estimated street).
Company: FutureWave Software, San Diego, CA;
 619-552-7680; <http://www.futurewave.com/>. **Reader Service:** Circle #406.

ElectricImage Broadcast 2.7



Pros' choice for 3-D animation gets more affordable.

EVEN IF YOU'RE NOT familiar with ElectricImage Animation System (EIAS), chances are you've seen its output. From photo-realistic flybys of the starship *Enterprise* in the *Star Trek* movies to the falling knife in *Mission: Impossible*, EIAS has been used to create the most-demanding 3-D animations.

Until recently, discriminating 3-D users had to be wealthy as well, thanks to EIAS' hefty, \$8,000 price tag. With EI Broadcast 2.7, however, the price drops to a still steep but far more affordable \$2,995. The Broadcast version includes all the features of the full-blown EIAS (still for sale at \$7,995) and retains its tandem-application approach: You sequence your animations in the ElectricImage application and render them in a companion program called Camera. The only difference between EI Broadcast and the full-blown EIAS is EI Broadcast's

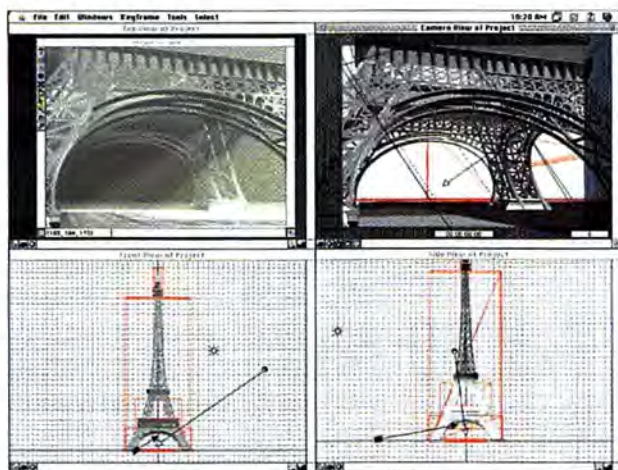
limitation of your animations to a maximum of 4,096 x 4,096 pixels, which is insufficient for feature-film-quality work but ample for output to video or computer screen. That resolution is fine for many print jobs as well, but just in case, the EI Broadcast package also includes a new still renderer that can render images at any size for print and illustration work. (If you need to create higher-resolution animations for film, you'll have to buy the full EIAS.)

Just Projecting

In addition to its lower price, the most obvious change with EI Broadcast 2.7 is the Project window's new, flashier 3-D look. But more than mere cosmetics have changed in this window, which you use for scoring and

sequencing animations via a series of precise timeline-based controls. The chief Project-window improvement makes it easier to take advantage of a key feature of earlier versions of EIAS — the ability to render large numbers of models (often extremely large ones) at the same time.

EI Broadcast 2.7 makes multiple-object management far easier than before, by letting you assign Finder-like labels to groups of models and sort the model list according to object name, label, or hierarchical (parent-child) relationships. Other Project-window improvements include the ability to select and change multiple keyframes simultaneously and an option that lets you view frames by frame number, seconds, or SMPTE time code. Still another improvement in ElectricImage controls is the addition of the Jog control,



ElectricImage Broadcast 2.7 extends volumetric-lighting features introduced with ElectricImage Animation System 2.5 to radial light sources as well as spotlights and now allows all lights to generate colored shadows.

which lets you scroll through animation frames while viewing a model or scene in any of the program's viewing windows (Camera, Top, Front, or Right).

One of EI Broadcast 2.7's best improvements overall is the addition of through-the-camera controls for aiming the camera. You can make all the movements you can make with a real camera — panning, zooming, tilting, dollying, and zooming — interactively by selecting the appropriate tool and dragging within the camera window to reposition the camera. These tools, combined with EIAS' camera and reference-point controls, give EI Broadcast 2.7 the most-powerful camera-positioning and -navigation tools on the Mac. Despite these improvements, version 2.7 suffers from the inability to define multiple

cameras, a shortcoming that will be fixed in the forthcoming version 2.7.5.

EI Broadcast 2.7 builds upon EIAS 2.5's introduction of volumetric-lighting effects, which first allowed objects in EIAS to obscure light sources in a scene. (In earlier versions of EIAS, lights had no volume, so light originating behind an object in a scene passed through the object without interference.) EI Broadcast 2.7 extends volumetric-lighting effects to include radial light sources as well as unidirectional, spotlightlike sources. This is a boon for creating realistic soft-light effects such as firelight. EI Broadcast 2.7 also offers other lighting enhancements, such as colored shadows (previous versions created only black shadows) and the new Enable Illumination check box, which lets you control whether a light source affects your entire scene or just a single object or effect (such as smoke or fog) within the scene.

Despite these advances, the program still has room to grow. Its texture-mapping interface needs major improvements (beginning with the ability to preview textures). And EI Broadcast 2.7's documentation, although improved over that of earlier EIAS versions, is still laughably spare, given the program's complexity and price. Also, users who are planning to use the new EI Still Camera to render stills will be disappointed to find that the still camera cannot yet render motion blur. Finally, although EI Broadcast 2.7 provides welcome support for the 3DMF (3D metafile) format of Apple's QuickDraw 3D, its implementation is a bit flaky: It successfully opened 3DMF files created in other programs, but a 3DMF file it created was not recognizable by other 3DMF-compliant programs.

The Bottom Line

Despite a few shortcomings, ElectricImage Broadcast 2.7 is at the front of the Mac 3-D-animation pack. And, as with previous versions of EIAS, the package's astonishing rendering speed makes it competitive with other 3-D animation programs on any platform. Electric Image's new pricing scheme is the perfect way to make EIAS (and the Mac OS) competitive with 3-D programs on other platforms. Hopefully, the lower price will make this great package accessible to more users.

/ Ben Long

ElectricImage Broadcast 2.7, \$2,995 (list). Company: Electric Image, Pasadena, CA; 818-577-1627; <http://www.electricimage.com/>. Reader Service: Circle #407.

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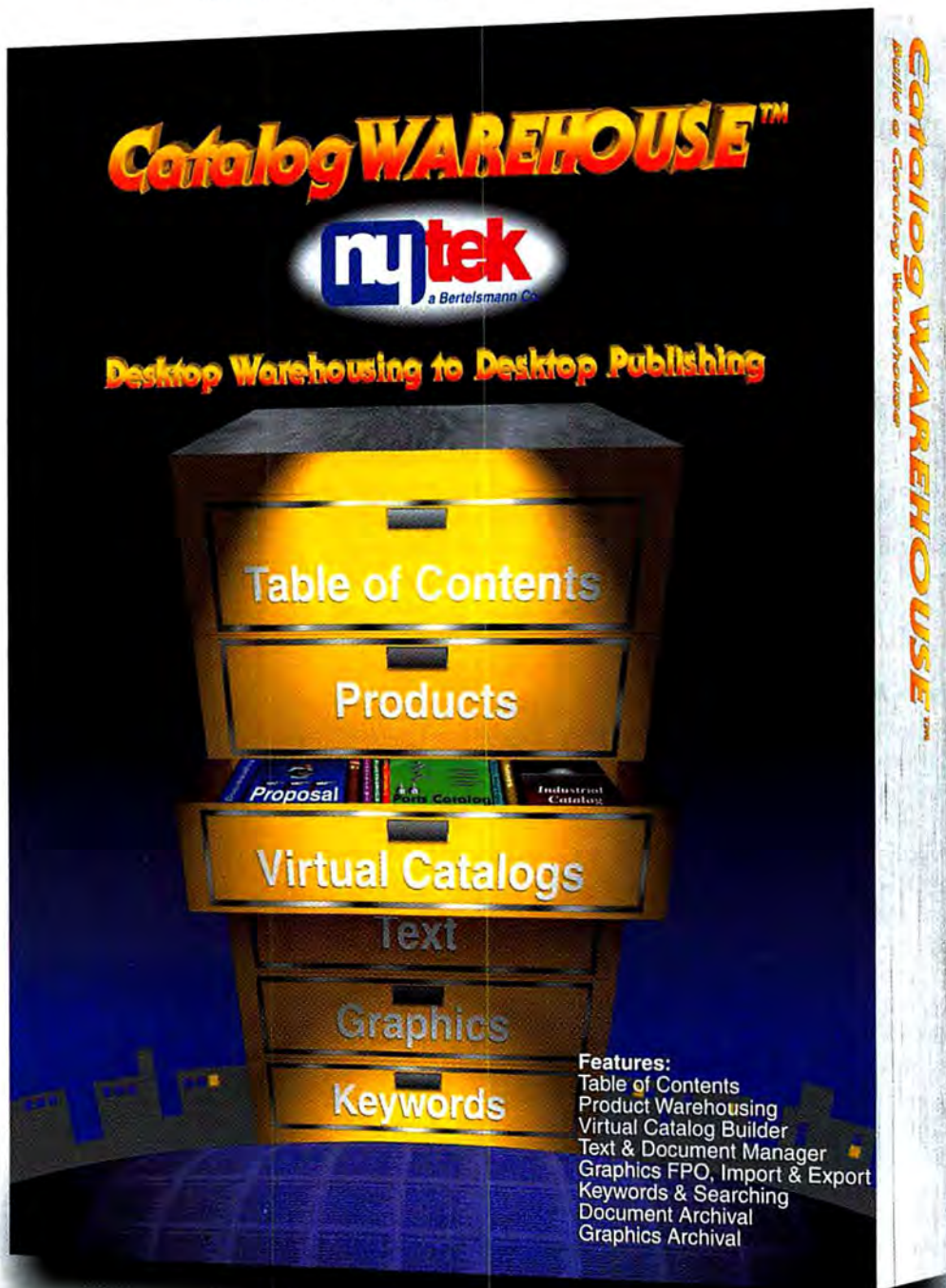
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Internet Telephony Programs

DigiPhone 

Internet Phone 

PGPfone 

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THE COGNITIVE LEAP that led to Internet telephony is not a great one: A local call to your Internet service provider gets you access to a global computer network; transmit voices over that network, and you can talk with someone halfway around the world for the cost of a local call (which is often nothing at all). The good news is, two commercial products — Internet Phone for the Mac, from VocalTec, and DigiPhone, from Third Planet — and one freeware application — PGPfone, from MIT — allow you to take advantage of this gaping loophole, and they all work reasonably well. The bad news, however, is that none are as reliable, or offer sound quality that's as consistently high, as your phone.

How It Works

All three programs are based on the same straightforward paradigm: Both parties in a conversation require Internet-connected computers equipped with microphone and speakers. Both participants must also have a copy of the *same* application; each of the three phone programs uses its own proprietary encoding/decoding scheme, so they cannot interoperate. (All three Mac OS programs have PC counterparts they work with, so you're not confined to calling Mac users, but the same-program restriction is the unwieldy equivalent of being able to call only people whose telephones were made by the same manufacturer as your own.) Finally, both parties in the conversation need to be outside security fire walls (or have a means of circumventing them).

All three Mac Net-telephony programs allow you to adjust the sound-sampling rate to optimize sound quality. Higher sampling rates deliver better sound, but they also demand more processing power and network bandwidth and are more difficult to sustain when

there's a lot of incidental Net traffic. For the best sound quality, you may need to tweak sampling-rate settings for each conversation — or even make adjustments during a session in order to compensate for changing network conditions.

DigiPhone allows sampling rates of up to 44.1 kHz, a rate that certainly is not usable over dial-up lines and is suited only for Ethernet connections at best. But when set to sampling rates identical to those of the other products, the quality of DigiPhone's sound is inferior. Internet Phone's top sampling rate is 8 kHz, and it sounds considerably better than DigiPhone at 8 kHz. The highest-fidelity sound belongs to the freeware PGPfone, which offers extraordinary clarity at 11 kHz — when computer processing power and network bandwidth can sustain it. At sampling rates that are usable over 28.8-kbps dial-up connections, PGPfone provides the highest-quality sound.

All three products give you the option of running in either full-duplex or half-duplex mode. In full-duplex mode, both parties can speak and be heard at the same time; in half-duplex mode, parties must take turns speaking. Full-duplex mode is more natural but can cause echoing problems in settings where a microphone is close to speakers — a common situation on many desktops. DigiPhone's and PGPfone's half-duplex implementations use a walkie-talkie-like talk button that's a bit awkward to use but that is effective in preventing two users from speaking at the same time; Internet Phone's half-duplex setup allows them to talk freely, at the risk of stepping on each other's speech. Although this takes a little getting used to, Internet Phone's half-duplex mode is easier to use than the push-to-talk method and provides most of the features of

full-duplex without the echo.

Dialing is straightforward in all three phone programs: Type another user's IP address into a field, and the application attempts to connect with that person's computer. If the target phone program is set up to answer calls, the recipient will hear a ring and be invited to answer.

Both DigiPhone and Internet Phone simplify the dialing process with address-book components in which you can store frequently used addresses. Both allow you to assign nicknames to address-book entries, so you can type in names instead of hard-to-memorize IP addresses. PGPfone's lack of an address book is its chief drawback. This will change in future versions of the product, which was recently purchased by PGP, which has plans to make it a supported, commercial package.

Both DigiPhone and Internet Phone are Mac versions of programs developed for the PC. VocalTec took admirable care to make Internet Phone look and feel like a Mac program, and it is the most elegantly designed of the three products. By contrast, DigiPhone's interface is somewhat cumbersome: You

have to do some digging to discover the program's various preference settings. The setup of DigiPhone is simplified, however, by its support for the popular shareware Internet Config, which furnishes information such as your IP and e-mail addresses to Web programs.

Privacy

DigiPhone's compatibility with Internet Config has a dark side, however: If Internet Config is installed on your computer, DigiPhone will give the other party your e-mail address, whether you want it to or not. In this age of diminishing personal privacy, a product should always ask permission before divulging






The most polished interface among Internet phone programs for the Mac is that of Internet Phone, from VocalTec.

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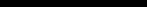

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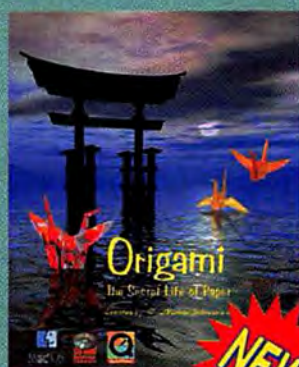
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any personal information to an outsider.

Internet Phone also displays a worrisome lack of privacy protection. When you first launch the application, it asks for several pieces of personal information, including your phone number — information it clearly doesn't need in order to connect to the Internet or to any other user. Add to this the fact that Internet Phone's default configuration immediately connects you to VocalTec's chat server — a forum in which speech-based online chats take place — and it's hard not to wonder whether or not your personal data is being collected unnecessarily. You can disable the automatic-server-connection option, but we wish the program would ask us if we wanted it in the first place, before it logged us onto the chat forum.

PGPfone, which evolved from a security program for encrypting phone exchanges among modem-equipped computers, is the most privacy-oriented of the three phone programs. It still supports direct modem- and AppleTalk-based connections in addition to Internet-based calls, and besides standard speech-encoding methods (the same ones used in cellular phones), it gives you the option of encrypting your conversations so that only someone who has your key code can understand what you're saying. Unfortunately, due to U.S. restrictions on encryption technology, PGPfone can be used only by U.S. residents and its export is strictly prohibited, so you can use it to talk cross-country on the cheap but not across the globe.

The Bottom Line

PGPfone offers the best sound quality of these three applications and has by far the most-robust security features — and you can't beat its freeware price. But its use is restricted to the U.S. and its lack of an address book makes it awkward to use. Internet Phone and DigiPhone each offer better ease of use, at reasonable but (needless to say) higher prices. Of the two commercial products, we recommend Internet Phone, for its better sound quality and more polished interface. / Stephan Somogyi

DigiPhone 1.0 for the Mac, \$19.95 (list). **Company:** Third Planet Publishing, Dallas, TX; 972-733-3005; <http://www.planeteers.com/>. **Reader Service:** Circle #408.

Internet Phone 3.01 for the Mac, \$49.95 (list). **Company:** VocalTec, Northvale, NJ; 201-768-9400; <http://www.vocaltec.com/>. **Reader Service:** Circle #409.

PGPfone 1.0b7, free. **Company:** MIT, Cambridge, MA; <http://web.mit.edu/network/pgpfone/>.

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Now is the time to buy a Mac! They're faster, more affordable, and never before has there been so many options from which to choose. MacUser editors evaluate all currently shipping Apple machines, including PowerBooks, and all Mac compatibles recommending them based on different user needs. Whether you're a desktop publisher, a home or business user, a student, a desktop video or pre-press pro, you'll find the Mac made for you in this issue.

MONOCHROME LASER PRINTERS MACUSER LABS REPORT

This March, MacUser Labs tests, reviews and mouse-rates 11 monochrome laser printers looking at speed, image quality, and overall performance. MacUser also discusses important features to consider when shopping for a laser printer: networking capabilities, paper options, and memory upgrades. These printers, all priced under \$4,000, range from producing 8-10 pages per minute, well-suited for the small office/home office, to 25 pages per minute, ideal for the medium to large sized business. For printer recommendations and more, the best output comes from MacUser.

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Reference Managers

Bookends Pro ★★★½

Bookends Web ★★★

EndNote2 Plus ★★★½

Organize source citations in long manuscripts — sort of.

WRITING A THESIS, journal article, or any other erudite essay is undeniably daunting. But for many, corralling the footnotes, endnotes, and bibliographies that accompany scholarly writing is even more arduous. Before you start asking whether you really need that graduate degree after all, consider a comprehensive reference manager and bibliography formatter such as EndNote2 Plus, from Niles & Associates, or Bookends Pro and Bookends Web, both from Westing Software. Although none of these programs does *all* the work of managing your manuscript citations, any of the three can simplify the tedious tasks of footnoting and generating bibliographies.

EndNote2 Plus and Bookends Pro are both designed for conventional printed-manuscript work. Bookends Web comprises Bookends Pro plus some additional tools that let you create hyperlinked annotations to publications created for the World Wide Web.

All three programs take the same basic approach: Before you begin writing your manuscript, you compile a reference database of your source materials, including author, publisher, and other essentials. You can also add keywords and abstracts of books or articles to help you search for entries later.

As you write your manuscript in the word processor of your choice, you insert your cursor at any spot in the text where you wish to place a citation. You invoke the bibliographic database program, select the appropriate source, and type in the relevant page numbers. The citation is formatted according to the preferences you've chosen, and it's associated with that location in the manuscript.

You can create hot-key shortcuts that invoke EndNote2 Plus or the Bookends products. If you use Microsoft Word 6, you can take advantage of another nifty option in EndNote2 Plus: It adds an EndNote2 Plus command to

Word's Tools menu, providing easy access to EndNote2 Plus from within Word.

When you place a citation in your document, EndNote2 Plus and the Bookends products put placeholders in the designated spot. These placeholders (and their assigned footnote or endnote numbers) remain temporary until you finish the paper and perform a final formatting of the citations. At that time, depending on your preferences and the way your word processor works, the citations are entered in a batch as footnotes, endnotes, and/or bibliography entries — all formatted according to the specifications you've chosen.

All three programs contain a variety of citation formats, standard for academic thesis papers, professional-journal articles, book chapters, and the like. Citations can be in predefined formats, or you can edit an existing format to make a new style.

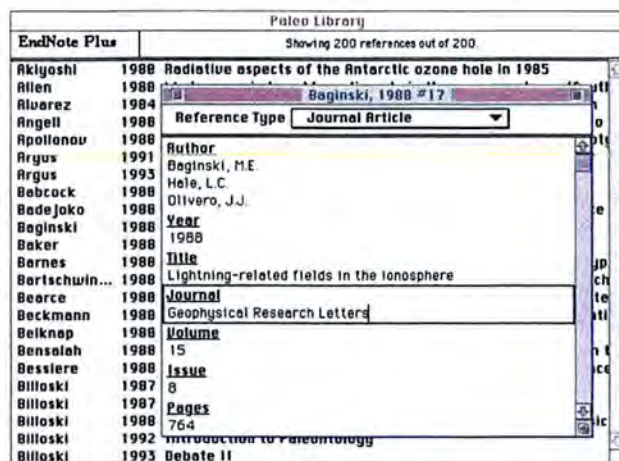
EndNote2 Plus and the Bookends products allow you to import source information from

create a large source library for ongoing use, you'll quickly come to depend on the search engines in your source manager. All three products provide comprehensive search engines that let you sift through your source list to find the entries you need. All also perform complex Boolean searches (using AND and OR operators).

Bookends Web is the only reference manager and bibliography formatter for the Mac that enables you to publish on the Web. You can use it to format citations in HTML (Hypertext Markup Language) for use on Web pages, or to generate citations for Web pages with hypertext annotations. Its documentation is sketchy and slim (and meant to be read in tandem with the Bookends Pro manual), but Bookends Web's functions are self-evident and the program is easy to use. Bookends Web's rudimentary browser makes it easy to preview your results.

In working with EndNote2 Plus, Bookends

Pro, and Bookends Web, we found the programs helpful but wished they went further in simplifying the footnoting process. In particular, we wished they were smart enough to recognize when a document contained multiple references to a single source and automatically generate "ibid." and "op.cit." references — a capability none of these programs has.



EndNote2 Plus' source-list and entry windows store bibliographic information for your manuscript.

commercial reference databases. EndNote2 Plus offers built-in support for Pro-cite, Refer, and BibIX Reference Manager, and it also allows you to import references from any tab-delimited text file. A plug-in called EndLink2 (\$79) lets EndNote2 Plus import data from a variety of other databases, such as Medline, that contain encrypted data. Bookends Pro and Bookends Web allow you even greater freedom to import references from database services or CD-ROMs. Bookends uses a system of tags that enables it to assign information in virtually any reference database to appropriate source fields. Using this function requires painstaking preparation, but it is extremely powerful.

If you work on very long documents or

For the production of conventional printed manuscripts — the types of documents that most commonly require formal citations — both EndNote2 Plus and Bookends Pro provide help. EndNote2 Plus, however, has the edge in terms of convenience and ease of use, particularly for those who are Microsoft Word users. For publishing your work on the Web, Bookends Web is the only game in town.

/ Rebecca M. Olson

Bookends Pro, \$129; **Bookends Web** (includes Bookends Pro), \$179. **Company:** Westing Software, Corte Madera, CA; 800-325-1862 or 415-945-3871. **Reader Service:** Circle #412.

EndNote2 Plus, \$169; **Endlink2**, \$79. **Company:** Niles & Associates, Berkeley, CA; 800-554-3049 or 510-559-8592; <http://www.niles.com/>. **Reader Service:** Circle #413.

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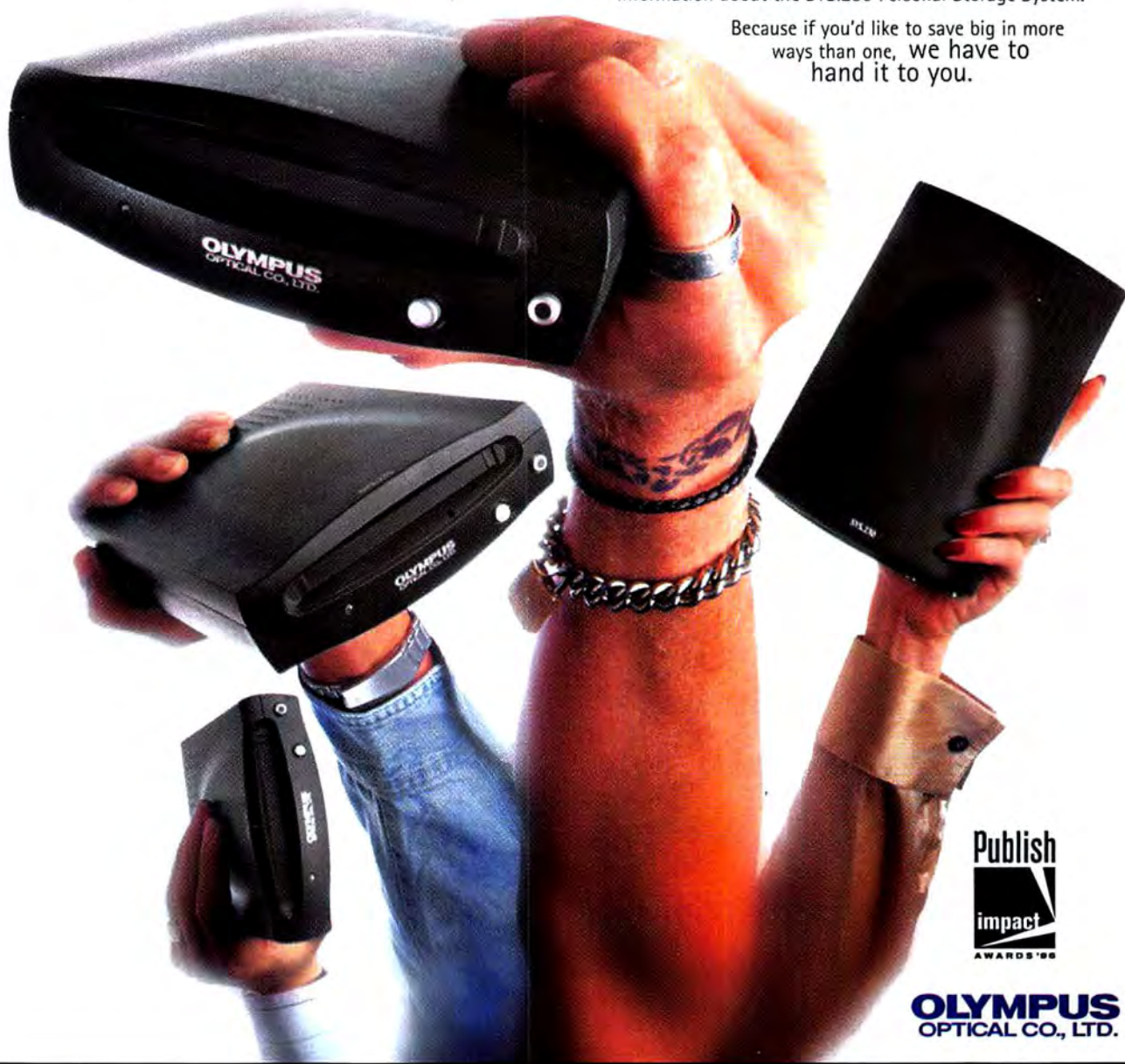
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*When purchased in package of five at suggested retail price of \$49.95. SYS.230 is a trademark of Olympus Optical Company, Ltd. All other brand or product names mentioned herein are trademarks or registered trademarks of their respective holders. ©1996 Olympus Optical Co., Ltd.

CIRCLE 69 ON READER SERVICE CARD

Macro Makers

KeyQuencer 2.0



QuickKeys 3.5



Updated utilities streamline tedious tasks.

TAKE CARE OF DULL, repetitive tasks with either QuickKeys 3.5, from CE Software, or KeyQuencer 2.0, from Binary Software. The latest versions of these macro-making utilities let you perform just about any task on your Mac with a single keystroke. You can, just for starters, set up a function key to type a string of text up to a page in length, adjust the sound level, or switch programs — or do all three sequentially. Both products are system extensions; both ship with hundreds of predefined timesaving macros; and both support batch processing, allowing you to apply macros to multiple files with one keystroke.

The more seasoned, better-known macro-making utility, QuickKeys, now goes beyond hot-key triggering, by allowing you to store

macros in floating palettes or tool bars.

QuickKeys still lets you create application-specific and global macros and still allows you to build macros by recording series of keystrokes and menu-command selections. But version 3.5 sports a slick new interface that lets you create macros without typing or recording, by selecting commands from prebuilt lists for the Finder and several other popular applications.

KeyQuencer 2.0, based on the still available shareware program KeyQuencer 1.2, is less costly than QuickKeys 3.5 — in both price and hardware requirements — but it also has fewer features. You can create most of the same macros you can create with QuickKeys, but you can't record your steps or use point-and-click macro-making screens. You create your macros the old-fashioned way, by typing commands.

The Bottom Line

Either QuickKeys or KeyQuencer can save you time and effort by boiling repetitive tasks down to single commands. Of the two time-

savers, KeyQuencer 2.0 requires less RAM, runs native on PowerPC-based systems, and is less expensive. QuickKeys 3.5, with its superb point-and-click macro-building window, offers unparalleled ease of use and extensive features that make it the better choice. / Bob LeVitus

KeyQuencer 2.0, \$39.95 (list). **Company:** Binary Software, Santa Monica, CA; 800-824-6279 or 310-449-1481; <http://www.binarysoft.com/>. **Reader Service:** Circle #414.

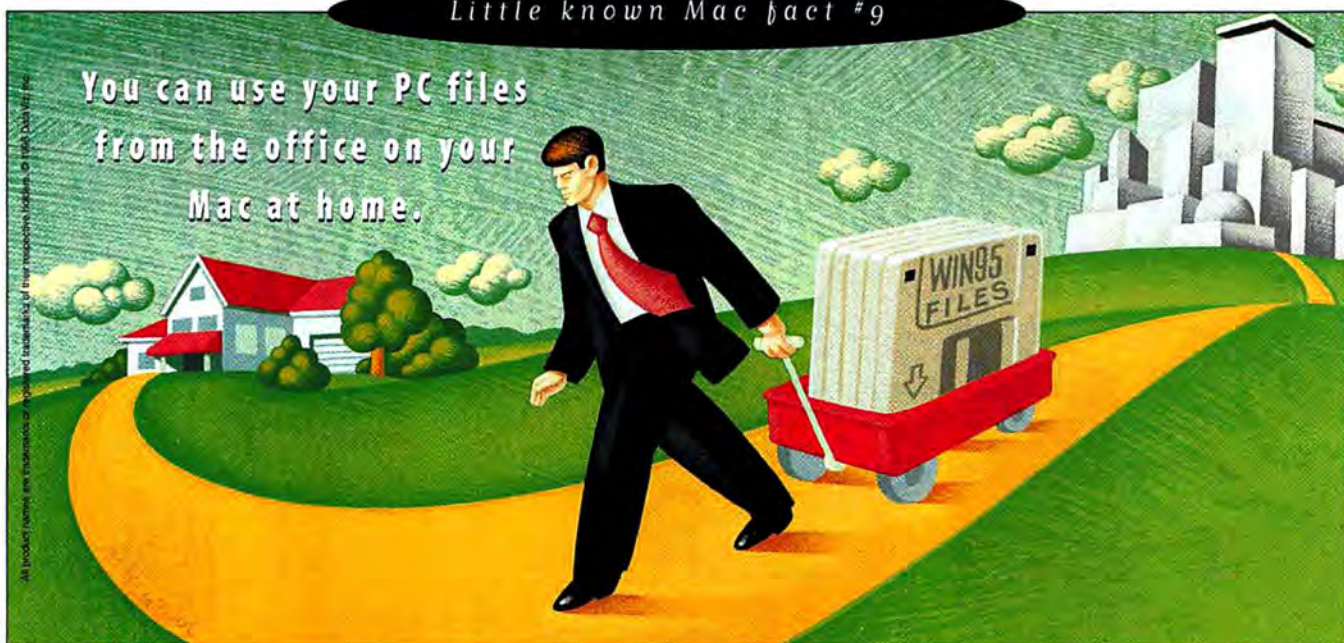
QuickKeys 3.5, \$119 (list). **Company:** CE Software, West Des Moines, IA; 800-523-7638 or 515-221-1801; <http://www.cesoft.com/>. **Reader Service:** Circle #415.



The new interface in QuickKeys 3.5 makes your favorite macros accessible with a point-and-click.

Little known Mac fact #9

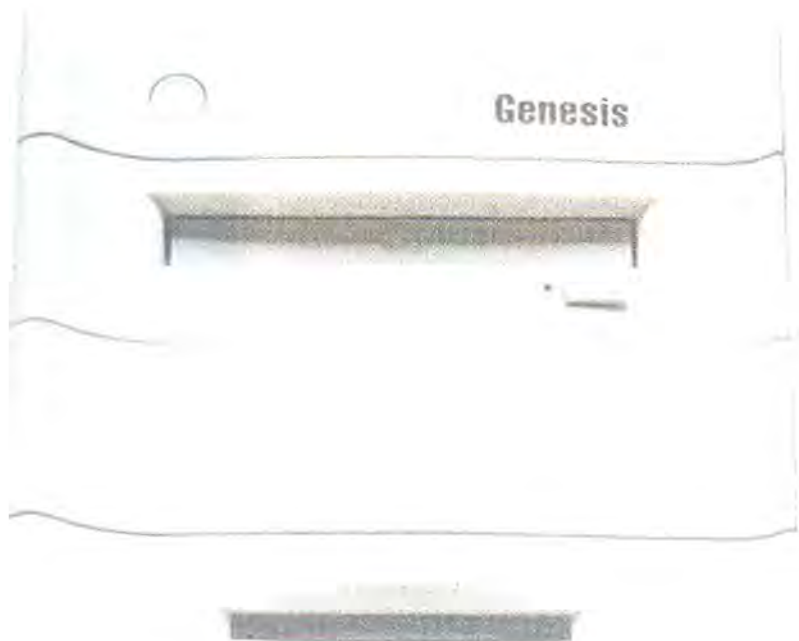
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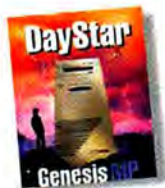


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You'll not only have plenty of speed, you have plenty to run on it. Twenty high-speed multiprocessing software packages are now available including Photoshop, After Effects and Premiere from Adobe, Electric Image, Strata Studio Pro Blitz, Apple QuickTime, Metrowerks CodeWarrior, and Deneba Canvas. Another 20 are in development!

As you can see, you can get money-making speeds from a DayStar upgrade for your existing system, or as one of a variety of DayStar Genesis MP computers. Either way, you'll lose wait fast. So if you make money with your Mac, you will make more with a nPOWER solution from DayStar. After all. We invented it.

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Boris Effects 2.0 for Adobe Premiere



Take your movies for a spin with this animation-effects program.

THE 3-D DIGITAL-VIDEO effects you can create with the Boris Effects 2.0 for Adobe Premiere plug-in, from Artel Software, rival those you get with far-more-expensive professional video hardware or sophisticated post-production software. But because Boris Effects 2.0's unwieldy interface makes it difficult and time-consuming to achieve these effects, the program is really no bargain when compared to the costlier alternatives.

Boris Effects' dialog box lets you layer an unlimited number of video clips, PICT files, and solid colors. The program gives you full control for scaling, positioning, and setting the opacity for each layer, as well as for lighting, cropping, and creating drop shadows.

Version 2.0 of Boris Effects makes up for one of Premiere's greatest shortcomings: lack

of multiple-keyframe control for transitions and effects. Where Premiere limits you to specifying effects' start and end frames, Boris Effects lets you change the rate and direction of effects at any frame. You can also create custom motion paths by using linear or spline curves — motion effects that are much more advanced than Premiere's. Still, it would be nice if this \$350 package had Bézier velocity and motion curves, for more-precise motion and speed control.

You integrate the special effects into your movie just as you would any other transition. Boris Effects supports sub-pixel interpolation and field rendering, so effects play back smoothly and look good if exported to analog video for broadcast.

Even though Boris Effects 2.0 runs only on PowerPC systems, it's slow. On a Mac with a 150-MHz 604 processor, it often took more than ten seconds for a Boris Effects dialog box containing four or more elements to open. In addition, we encountered some odd quirks while using Boris Effects: For instance, sometimes when we pressed the Return key, the program entered random numbers into fields.



You can layer an unlimited number of videos, images, and video effects in Boris Effects 2.0 for Adobe Premiere's dialog box

The Bottom Line

Boris Effects is mainly useful because Premiere doesn't have significant multiple-keyframe animation capabilities. But if these kinds of 3-D effects are a large part of your work, you'd get more bang for the buck from the more expensive but more full-featured digital-video production program Adobe After Effects. / David Biedny and Nathan Moody

Boris Effects 2.0 for Adobe Premiere, \$350 (list). **Company:** Artel Software, Boston, MA; 617-451-9900; <http://www.artelsoft.com/>. **Reader Service:** Circle #417.

ProView



Presentation software takes simplicity to the extreme.

WITH ITS ULTRASIMPLE interface and frugal feature list, ProView is a multimedia presentation program for people who don't like presentation programs. In fact, ProView might be just good enough for those who want to quickly assemble images, sounds, movies, and text into hot-linked presentations without having to negotiate more than a gentle learning curve and a 40-page manual. But although simplicity is a virtue, most ProView users could quickly find themselves lusting for sexy features found in other presentation programs that cost just as little as ProView.

ProView uses a tried-and-true slide-based metaphor for designing presentations, although it calls its slides pages. To start, you define the size of your pages. You can place text, PICT or JPEG pictures, SND or AIFF

sound files, and QuickTime movies in each page, using commands in a handy floating tool bar or, even handier, by dragging and dropping directly from the Finder.

ProView allows you to create hot spots on a page that, when clicked, take you to a subsequent page or trigger simple actions, such as playing a sound. You can have QuickTime movies or sounds play as soon as you enter a page or have a sound looping constantly in the background. You can also run any ProView project in slide-show mode, which cycles through each page automatically.



It's easy to create basic presentations with ProView, but the program lacks features you'll find in similarly priced presentation programs.

Once you've created a ProView project, you can save it as a stand-alone ProView viewer so people who don't own ProView can see your presentations on any Mac.

Although simple to use, the program isn't always user-friendly. Many actions can't be undone, and some, such as deleting a hot spot, can't be undone even if you revert to the last saved version of your presentation. In fairness, ProView warns you when you're about to perform an irrevocable action, but Mac programs should be more forgiving.

The Bottom Line

Although we appreciate ProView's nod to no-frills minimalism, a multimedia application with no transition effects except for a very limited screen dimmer looks pretty amateur these days. Many similarly priced multimedia presentation programs offer more impressive (and useful) features than ProView does. Even if you intend never to use those features, their presence makes ProView seem overpriced.

/ Eric S. Taub

ProView 1.3, \$99.95 (list). **Company:** E-magine, New York, NY; 212-665-0030; <http://www.e-magine.com/>. **Reader Service:** Circle #418.



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CIRCLE 22 ON READER SERVICE CARD

TechTool Pro



Utility identifies damaged hardware and system software.

IT'S EASY TO FORGET that Macs are made of hundreds of electronic and mechanical parts that usually work together seamlessly. When they don't, you're likely to see the sad-Mac icon rear its ugly head, followed by a costly trip to the repair shop. To help uncover the mystery of your Mac's distress — or just ensure that a happy Mac is working as it's supposed to — MicroMat Computer Systems developed TechTool Pro, a diagnostic utility that checks and identifies damaged hardware components and corrupted system software. It's a feature-packed program that performs more than 300 comprehensive pass/fail tests, including checks of your modem, keyboard, mouse, monitor, floppy drive, hard drive, memory, processor, CD-ROM drive, and more. It also offers lightweight benchmarking to measure speed and make comparisons among various Mac models.

The program sports a clutter-free 3-D interface with file-folder-like tabs that access each test suite. You can use check boxes to pick the tests you want to run within each suite or use the Auto-Pilot mode, which can be configured to shut down your computer after the completion of testing. If a test fails, a dramatic skull-and-crossbones graphic appears and an advice window explains the details and what to do next. Test results are saved and can be printed out in report form.

To rule out software problems that can masquerade as bad hardware, TechTool Pro scans

critical System Folder components, including the Finder, the system suitcase, enablers, and update files. It compares these items with a database of stable system files and identifies any resources that are damaged. This is extremely useful for tracking down sources of random crashes. TechTool's hardware testing is the most comprehensive we've ever seen.

The Bottom Line

TechTool Pro is extremely useful for resolving unusual system-software problems and for testing and identifying damaged hardware. Its

ability to detect corrupted system software is one of its strongest features.

Although TechTool Pro can't fix broken hardware, its diagnoses will make you feel secure when you call a repair shop. It's the ultimate complement to a disk-utility package and is essential for giving your Mac a checkup that's beyond the capabilities of other utility programs. / John Christopher

TechTool Pro 1.0, \$150 (list). **Company:** MicroMat Computer Systems, Windsor, CA; 707-837-8012; <http://www.micromat.com/mmcs/>. **Reader Service:** Circle #419.

DeltaGraph 4.0



Transform graphs and charts into works of art.

WITH THE SOLID CHARTING and graphing options of ClarisWorks and Microsoft Excel, you have to ask yourself one question: Why would you pony up an additional \$195 for a separate charting and graphing application? Well, if the application is DeltaPoint's DeltaGraph 4.0, the answer is simple: It gives you the tools and features to create more types of charts than ClarisWorks or Excel users can even dream about.

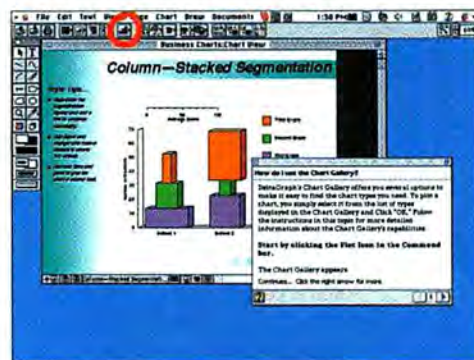
Want to create a stacked pie chart? No problem. How about a stacked segmented bar chart? A piece of cake. In fact, you can generate more than 100 chart types and customize their appearance with all manner of legends, text, images, axis breaks, and equations.

DeltaGraph 4.0 works on a project basis. With a single worksheet of data (columns and rows), you can produce multiple charts, each highlighting a different aspect of the data. You can have multiple chart and data pages for each project — although, as in Excel, you cannot view a chart and the worksheet that creates it simultaneously. Unlike Excel, DeltaGraph doesn't let you put a chart on a worksheet page, which is an inconvenience. The DeltaGraph 4.0 interface changes between charting and worksheet modes, which can be a bit daunting for newbies, since menus, tool bars, and palettes change with the mode. But a little practice will have you charting like a pro in no time.

Data handling and management are not DeltaGraph 4.0's strong suits. Its worksheet,

called a Data Page, lets you do very basic data tweaking, so that the right items show up in the right order in your charts. Beyond that, though, you need to do your number crunching elsewhere and then feed the results to DeltaGraph 4.0 for plotting.

The program produces simply gorgeous charts. They scale automatically, even their labels and legends. When you change an element, every other element changes to fit the



A host of flexible graphing options make DeltaGraph 4.0 the tool for creating impressive-looking charts and graphs.

new pattern. DeltaGraph's finesse comes from its editable layouts, which let you assign your charts a consistent look, much as you can with presentation layouts produced by Microsoft PowerPoint or Adobe Persuasion.

The Bottom Line

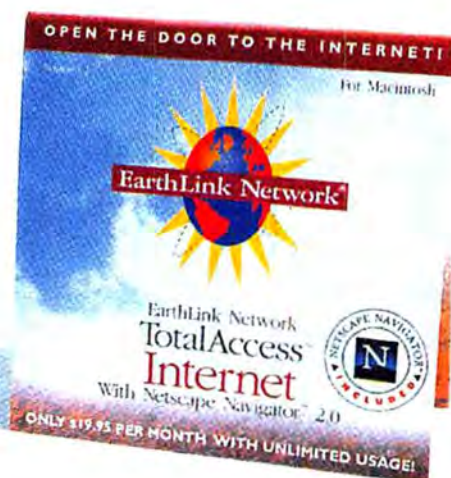
DeltaGraph 4.0 is easy to learn and use and includes outstanding documentation and an Apple Guide. If you need to produce lots of charts in your daily work and are a spreadsheet or database junkie, DeltaGraph may be the perfect accompaniment. / Don Crabb

DeltaGraph 4.0 for Macintosh, \$195 (list). **Company:** DeltaPoint, Monterey, CA; 800-446-6955 or 408-648-4000; <http://www.deltapoint.com/>. **Reader Service:** Circle #420.



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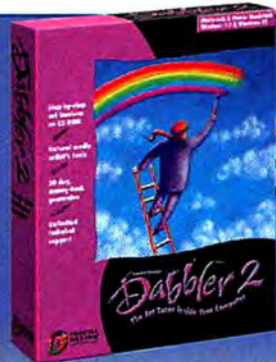
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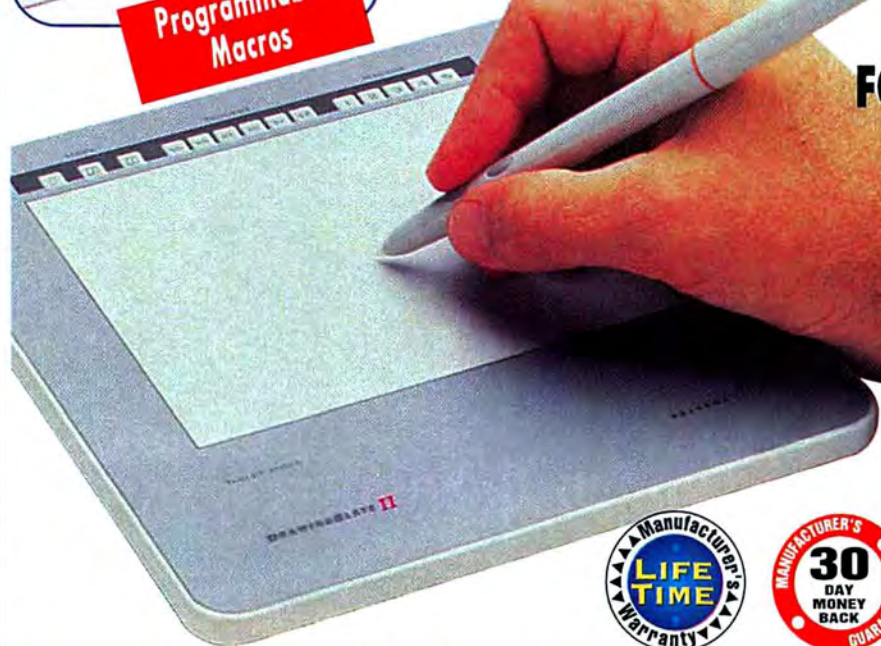
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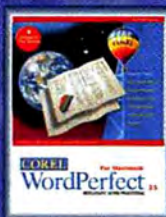
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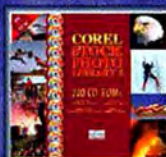
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With the future of the Mac OS more in doubt than ever, can a Mac-savvy BeOS offer users the power they've been hoping for?

BY HENRY BORTMAN AND JEFF PITTELKAU

APPLE IS IN TROUBLE. After slipping the schedule on Copland, its much ballyhooed next-generation operating system, by nearly two years, the company has now canceled the project entirely. It's bad enough that Apple was beaten to the punch twice by

Plan Be

Microsoft, first with Windows 95 and more recently with Windows NT 4.0. Now, it's got Be, Inc., led by former Apple technology head honcho Jean-Louis Gassée, nipping at its heels as well. Be is developing from scratch a thoroughly modern operating system that, like the Mac OS, runs on PowerPC processors. Unlike the Mac OS, however, the BeOS demonstrates just how powerful PowerPC processors really are. On identical hardware — Be has ported its operating system to run on Mac hardware — the BeOS leaves the Mac OS in the dust.

To add to the pressure on Apple, Power Computing has signed an exclusive agreement with Be to bundle the BeOS for Power Mac with its clones. The implications of this move are staggering. It is only in the last couple of years that Apple has allowed other vendors to clone the Mac and customers have had a choice of companies to purchase Mac hardware from. Now, with the advent of the BeOS, Mac users will also have an alternative operating system to run. In fact, according to published reports, Apple is seriously considering, as one option for solving its current OS dilemma, adopting the BeOS as the foundation of a future version of the Mac OS.

So just what is the BeOS, and why all the hoopla? To find out, we hauled a couple of BeBoxes (BeBox is Be's name for its proprietary multiprocessor computers), along with an alpha version of the BeOS for Power Mac, into our labs and ran the new OS through its paces. What we found is detailed in this exclusive report on what just might become Plan Be for the Mac.

Going from Mac to Be

Apple's announcement earlier this year that it was scrapping its plans for Copland was a sobering signal that Mac OS development was in serious disarray. Copland was to have been the first stepping stone on the path to a truly modern Mac OS. The end point on that path was supposed to be a version of the Mac OS code-named Gershwin. Gershwin was originally scheduled for release by the end of 1996. Needless to say, that's unlikely to happen now.

All the company will say publicly is that it will ship updates to System 7 twice a year with bits and pieces of new functionality added over time. In the absence of a formal plan for modernizing the Mac OS, the rumor mills have been abuzz with talk of the company going outside its organization to solve the problem. A few brave souls have even suggested that Apple might put its look and feel on top of Windows NT. Another rumor suggests a possible technology merger between the Mac OS and Be's object-oriented, multimedia-study operating system.

Although Apple has offered no comment on Be rumors, the prospects are intriguing. Such a move might provide a much faster track to a modern Mac operating system. To understand what all the excitement was about, we spent countless hours at Be's facilities grilling Gassée and his small squad of brilliant engineers (many of whom got their start writing OS code at Apple) on the underlying architecture that makes the BeOS so powerful.

Take one look at the BeOS, and you'll be stunned. It's amazing to see a BeOS system simultaneously play multiple QuickTime movies and an audio file, serve and browse Web pages, and render 3-D animation, all in real time. Don't try this on a Mac.

On the Mac, if you hold the mouse button down on the menu bar, your whole Mac will essentially go to sleep until you release the mouse button. This is true for any Mac, whether it has one, two, or four processors. It doesn't matter how fast those processors are either: They



The BeBox offers two PowerPC processors and a plethora of ports for under \$3,000.

could be running at 1,000 MHz, and your Mac would still grind to a halt.

After we'd pounded on our BeBoxes and Be-powered Macs for a few weeks, going back to the Mac OS — even on powerful Macs — was painful. (For more details on how the BeOS compares to the Mac OS, see the "First Look: The BeOS for Power Mac" sidebar.) The reason? The BeOS implements precisely those modern operating-system technologies that are missing from System 7 and whose absence holds the Mac back.

Be Stable

The two most important hallmarks of a modern OS are stability and performance. We'll examine stability first. A well-architected system rarely crashes. What makes an OS stable? Protected memory, virtual memory, and object-

oriented design. The BeOS implements all three.

Protected Memory. In an operating system with protected memory, such as the BeOS, each application runs in its own memory space, which can't be written to by other applications. If an application tries to access another application's memory space, the BeOS terminates the offending application without bringing any other application or OS process down.

Memory protection is also provided in Windows NT. In fact, Microsoft takes this matter very seriously in Windows NT 4.0 — it considers the ability of any application to crash the operating system a bug. However, in Apple's System 7, there is no memory protection — applications and extensions are free to stomp on other applications at will. When an application writes to an inappropriate memory address, you usually have to reboot your entire system and relaunch all the applications you had open.

Copland would have provided protected memory for "server tasks." That's the term Apple uses to describe many parts of the OS and some applications or portions of applications. The catch: In order to qualify as a server task, an OS or application function can't access the Mac user-interface toolbox. Examples of server tasks under Copland included the Mac file system (although not the Finder) and a Photoshop filter operation (although not the redrawing of the results of the filter to the screen).

The Mac Toolbox and all applications that have user interfaces — in other words, everything that users interact with directly — would have run together in one shared memory space. Within this shared memory space, applications would have interacted pretty much as they do in System 7. Any application that crashed would have been just as likely to take down the whole Mac user environment as it is today. Server tasks, which would have included much of the nuts and bolts of the Mac OS, would have kept running. The net effect: Your Mac would still have crashed, but it would have taken less time to reboot, because you wouldn't have needed to restart the whole OS.

Virtual Memory. The BeOS and Windows NT both support a true virtual-memory system. Copland was to have one as well. A virtual-memory system provides an application with as much memory as it

needs, on the fly, first by parceling out RAM and then by using space on a hard disk as additional RAM. In a virtual-memory system, memory is divided into small sections called pages. The most recently used pages are kept in physical RAM, where the processor has rapid access to them. Less recently used pages are stored on the hard disk, ready to be reloaded into physical RAM as needed.

On a true virtual-memory system, you don't have to specify ahead of time how much memory you want. The OS automatically assigns virtual RAM to an application whenever it needs it. As you launch more applications or work on bigger files, more hard-disk space is allocated to accommodate the demands of your work. This means that you can run a lot of applications with only a small amount of physical RAM in your system.

System 7 has a virtual-memory system, but it's limited. Its swap file (the virtual-RAM space on the hard disk) is a fixed size. To change it, you have to reboot. Also, you must tell the OS ahead of time how much memory to allocate to each application. Unless you provide enough memory to a particular application, you may be greeted with an out-of-memory error.

Object-Oriented Design. The BeOS is a fully object-oriented operating system. One benefit of this is that programmers have an easier time developing BeOS programs than they do programs for the Mac or for Windows, because they don't need to use as many APIs (application-programming interfaces). For example, to program Clipboard functions as well as interapplication communication into a Macintosh app,



Power Computing is the first Mac vendor to bundle the BeOS with its systems.

developers must use two separate APIs. But with the BeOS' object-oriented design, the same Be API can be used to accomplish both tasks. Moreover, BeOS code is reusable. This makes BeOS programs quicker and easier to develop; it also makes them smaller, faster-launching, and — due to their simpler design — more stable.

Be Fast

Modern operating systems use a mechanism called preemptive multitasking to efficiently allocate microprocessor time among multiple applications and OS services. The BeOS and Windows NT utilize preemptive multitasking. In both operating systems, a low-level task manager called a microkernel schedules tasks in round-robin fashion according to their priority. Each task is allowed access to the processor for only a fraction of a second,

called a time-slice, which in the BeOS is only three-thousandths of a second. Preemptive multitasking is what makes it possible for a BeOS system to perform multiple complex tasks simultaneously.

Even in the BeOS, preemptive multitasking has its limitations. As you run more and more applications, new apps launch more slowly, text-based apps begin to get a bit sluggish, then multimedia events such as video playback start to get jerky, and finally — if you push the system hard enough — the mouse gets less responsive. But on a BeOS system, you have to try really hard to get things to bog down, and this is almost always caused by an overloaded virtual-memory system.

The Mac OS, on the other hand, uses a scheme that Apple has

Be's Plan for Mac Compatibility

BE'S ORIGINAL PLAN was to develop a modern operating system capable of handling the media-rich data today's computing tasks require: video, 3-D imaging, sound, and high-resolution graphics. Be's new OS, in a quest for greatly improved performance and stability, would break all ties with the past. Be didn't want to be hamstrung by having to support programs developed to run on operating systems designed over a decade ago. It wanted to start with a clean slate.

The company's success at achieving its goal, however, had an ironic consequence. In an effort to expand the number of computers on which the BeOS could run — initially it ran only on the proprietary BeBox hardware — Be decided to port its OS to Mac hardware. Because both the BeBox and Power Macs use PowerPC processors, this was a relatively easy task. Today, the BeOS can run not only on the BeBox but also on the majority of Power Macs and Macintosh clones. Power Computing plans to ship the BeOS (along with the Mac OS, of course) preinstalled on many of its clone systems,

beginning in January 1997.

Not surprisingly, seeing the BeOS run on Mac hardware made the question of Mac-application compatibility a bit more important. However, the key issue in how Be proceeds is whether Apple decides to cooperate with Be or whether Be will be forced to go it alone.

Even if Apple chooses not to support the BeOS, Be plans to build increasing support for existing Mac apps, and for the Mac toolbox, into successive releases of its OS. Without Apple's buy-in, don't expect ever to see complete support for all things Mac in the BeOS. Instead, Be will focus on providing support for those parts of the Mac OS required to make popular Mac graphic-design, desktop-publishing, authoring (Web and multimedia), and digital-video applications behave properly on the BeOS.

Because so much depends on what Apple decides to do and on how the market responds to Be, it's too early to know what path Be might take beyond mid-1997. However, what is clear is that Be will first make every effort to license key components

of the Mac OS, such as the QuickTime Media Layer, QuickDraw 3D, and ColorSync, and port them to the BeOS. Once this is done, the company will build an emulation layer that allows Mac applications to run under the BeOS.

Right now, Be is entertaining a few approaches to building this emulation layer. One would involve running Mac applications together in one memory space, not unlike the way Insignia's SoftPC emulates Windows on Macs today. A more ambitious plan would have each Mac application running in its own protected memory space with a "slimmed down" version of System 7, although Be admits that getting interapplication communication (to support features such as Macintosh Drag and Drop) may be difficult with this approach.

Unfortunately, without Apple's support, the functionality of key middleware technologies, such as ColorSync and QuickTime, may be a long time coming. And of course, without Apple, the BeOS may never have an interface as refined as the one currently used by the Mac OS.

dubbed "cooperative multitasking." For years, Apple went to great lengths to convince customers that cooperative multitasking was actually *better* than preemptive multitasking. Now that the shortcomings of the Mac OS approach have become evident, Apple doesn't bother singing the virtues of cooperative multitasking any longer.

Under cooperative multitasking, each application can keep control of the processor for as long as it wants. Whenever it feels like it — the application's programmer decides how often that will be — an application checks to see whether or not another application would like some time on your Mac's CPU. As a result, an e-mail client program can lock up your Mac for minutes at a time, allowing no other work to go on while it sends a file to the server.

What's frustrating about this approach is that most applications don't keep the processor busy the whole time they have control of it. Much of the time, an application is waiting for tasks to complete that aren't dependent on the processor — sending data over the network or reading a portion of a file from disk, for example. During these precious fractions of a second, other applications could be using the processor to get work done.

Under Copland, preemptive multitasking would have been available only to server tasks. The reason for this limitation lies in another modern OS feature: reentrancy. Reentrancy allows the same toolbox code to be shared by many tasks simultaneously. The Copland toolbox would not have been reentrant. If, for example, one application requested the Copland toolbox to create a new window on the screen but was preempted by another app also requesting a new window, the toolbox would get confused, causing the system to crash. In a preemptively multitasked system, such overlapping calls are common.

Under Copland, faceless parts of the Macintosh toolbox, such as the file system and networking, were supposed to be reentrant. However, without a reentrant user-interface toolbox, applications that require a user interface — and most do — would have continued to be cooperatively scheduled, much as 16-bit Windows applications are under Windows NT. Apple didn't plan to introduce a reentrant user-interface toolbox until Gershwin.

Be Faster

Part of what makes the BeOS snappy when handling multimedia tasks is its emphasis on multithreading. Threads are parts of programs that independently manage individual streams of computation or communication with other programs. The BeOS enables applications to generate threads even when programmers have done nothing explicitly to set the threads up. For example, if you play a video on a BeOS system, the OS generates two threads: one, for the video player, decompresses the video frame by frame, and the other, in the BeOS' application-server code, manages drawing those frames in the window on the screen. The short duration of the time-slice allotted to each thread, combined with the high priority given to multimedia threads, is what makes the BeOS so good at doing lots of multimedia tasks simultaneously. Both Windows NT and the Mac OS support limited threading, but developers must specifically support threading in their programs to take advantage of the feature.

Another performance-boosting capability of the Be operating system and Windows NT is symmetric multiprocessing (SMP), which is the ability for multiple threads to run simultaneously on multiple processors. Right now, the BeOS can support 2 processors; Windows NT

An OS Shoot-out / how System 7, Copland, Windows NT, and the BeOS compare

	Hardware-Abstraction Layer	Preemptive Multitasking	Protected Memory	Modern Virtual-Memory System	Symmetric Multiprocessing
OPERATING SYSTEM	Makes it easier for vendors to change hardware without making changes to the OS.	Multiple applications run smoothly. No single app is allowed to take over the entire system.	Applications that crash can't crash other applications or the rest of the computer.	You can launch as many applications as you want, as long as a minimum amount of RAM is installed.	Numerous independent tasks can execute at the same time (requires two or more processors to be installed).
System 7.5.5	No. New version of OS or "enablers" are needed for each new hardware design.	No. Multitasking on the Mac is cooperative, so one application can hog the system for long periods of time. Preemptive threads are possible but can't affect toolbox.	No. Misbehaving Mac apps can crash entire system.	No. Amount of total virtual memory and application memory must be set by user. Virtual memory is slow and can conflict with applications.	No. Multiprocessing is available, but the Mac operating system and applications run together on one processor.
Copland	Yes.	No. Mac applications and the Mac user environment run cooperatively. All other system services and server tasks can run preemptively.	Limited. Underlying operating system and server tasks are protected, but Mac apps can still crash user environment.	Yes.	Limited. Only tasks that don't access the Mac toolbox can take advantage of symmetric multiprocessing.
Windows NT 4.0	Yes.	Yes, except for older, 16-bit Windows applications, which run cooperatively.	Yes.	Yes.	Yes.
BeOS	Yes.	Yes.	Yes.	Yes.	Yes, but the BeOS currently supports only two processors.

(in server configuration) can support up to 32. On the BeOS, symmetric multiprocessing allows multithreading to really pay off, especially when there's lots of I/O happening. On a two-processor BeBox, for example, it's possible for one thread to be decompressing a frame of a movie on one processor while another thread uses the second processor to display the frame that was just decompressed. The BeBox's two relatively slow (and inexpensive) processors enable the BeOS to do more things at the same time, and more smoothly, than it would on a system with one more-powerful processor.

System 7.5 supports multiprocessing, but it's not symmetric. In 7.5, all the processors in a multiprocessor Macintosh work on different parts of the same task. Applications can send requests for performance of tasks — applying a Photoshop filter, for example — to only one of the Mac's processors at a time. That processor, in turn, can parcel out subtasks — say, applying the filter to different sections of the image — to the other processors. But one processor can't be working on a Photoshop filter while another is sending e-mail over the network. And even this limited multiprocessing must be explicitly supported by the application.

Be Good Enough?

One of the BeOS' most compelling features is an integrated database that is used extensively within the operating system. For example, all information about a BeOS system's file hierarchy is stored in the database. As a result, Be's query utility works almost instantaneously when searching for files that match user-specified criteria.

Be also uses the database to provide a directory service called People. People contains database records that store information about

individuals and companies, such as name, address, phone numbers, and e-mail addresses. This feature, in turn, is integrated with Be's Internet-mail application, BeMail. To address an e-mail message, you need only drag People icons to the messaging window's address fields. Both People information and other OS-managed data can be utilized by application developers.

Beyond the database and its multitude of modern OS features, the BeOS provides little of the elegance the Mac OS is famous for. The Macintosh as we know it today is not so much an operating system as it is a collection of great software technology. What makes the Mac OS great are APIs such as QuickTime, QuickTime VR, QuickDraw 3D, WorldScript, and ColorSync. It is these technologies, along with the advantages of its user interface, that continue to make the Mac the platform of choice for publishing, multimedia authoring, and Web-content creation.

Such advantages might once have been enough to maintain the Mac's dominance in its stronghold markets. But there is a new challenger to that dominance. Windows NT 4.0 has finally shipped, and the word on the street is that it's stable and fast. Finally the PC marketplace has an operating system that can turbocharge key applications, such as Adobe Photoshop and PageMill and Macromedia's Director, that content creators have historically bought Macs to run.



RELATED INTERNET SITES

- **The Be Web Site**
Be's home page.
 - **The BeMacOs Page**
A Web page evangelizing the adoption of the BeOS by Apple.
 - **Power Computing**
More about the first Macs to ship with the BeOS.
- GO TO** <http://www.zdnet.com/macuser/0197.html#be>

Multithreaded User Interface	100-Percent-Object-Oriented Application-Programming Interface	Multimedia Support	File Sharing	Networking	Internet & E-Mail
Mouse-downs on objects do not freeze the rest of the screen. Windows continue to update when you move them.	Rapid application development. Applications are typically small and launch fast.	Allows playback of digital movies, animations, sound, 3-D images, MIDI files, and the like.	Allows network users to access files on your computer, and vice versa.	Allows you to connect to other computers in your environment.	Allow you to access Web sites or use your computer to host a Web site of your own.
No.	No, although OpenDoc delivers some of this functionality.	Yes. QuickTime, QuickTime VR, QuickDraw 3D.	Yes.	AppleTalk, IPX, and TCP/IP. Apple to release its own PPP very soon (currently freeware).	Yes. Apple systems come bundled with Apple Internet Connection Kit, with Claris E-mailer, Netscape Navigator, NCSA Telnet, Fetch, and News Watcher.
No.	No, although OpenDoc delivers some of this functionality.	Yes. QuickTime, QuickTime VR, QuickDraw 3D.	Yes.	AppleTalk, IPX, TCP/IP, and PPP.	Yes. Apple has stated that Internet access is at the core of its future Mac OS strategy but has yet to provide specifics.
Limited. Windows do not update when you move them.	Limited. Parts of OS are object-based, parts aren't.	Yes. ActiveMovie, DirectDraw, DirectInput, DirectSound.	Yes.	NetBEUI, IPX, TCP/IP, PPP, PTPP, AppleTalk, and more.	Yes. Microsoft's Messaging Client and Internet Explorer are bundled. NT Server includes Internet Information Server.
Yes.	Yes.	Limited. CinePak, MIDI, AIFF sound, and proprietary 3-D support. DR9 will add OpenGL.	Limited. Remote FTP access supported with single user name and password for entire disk.	Only TCP/IP and PPP. AppleTalk by spring '97.	Limited. Simple SMTP/POP e-mail client software, Web browser, and Web-server bundle.

first look: The BeOS for Power Mac

TO PUT IT BLUNTLY, the speed of the BeOS is nothing short of phenomenal. When we first encountered it, the BeOS was running on a proprietary BeBox. All BeBoxes ship with dual processors, so we assumed that the responsiveness of the system was due in large part to the second processor and faster hardware.

Even if that had been the case, we would still have been impressed. On the Mac, multiprocessor systems are useful only for accelerating specific compute-intensive functions in a handful of applications. The BeOS, in contrast, implements fully symmetric multiprocessing, so all the work done on a dual-processor system is distributed between the two CPUs and hence every task on the system gets a boost.

Impressive as the BeBox was, it was when we saw the BeOS running on a PowerCenter 150 that our jaws dropped. Keep in mind that by current standards, the 150-MHz PowerPC 604 chip in this system is somewhere in the middle of the processor-speed spectrum. Even though the PowerCenter wasn't tricked out with the speediest processor available and although it contained only a single CPU, the BeOS ran circles around the Mac OS running on the same machine. When you think about it, though, it actually behaved as you'd expect a computer to behave: When we clicked the mouse on a button or a menu, it responded. Instantly. No matter what else was going on.

We've all grown so used to the limitations of the Mac OS that we hardly give it a second thought when we have to wait up to a minute for an application to launch. Or when we can't do anything but sit and watch a progress bar while we wait for a file to finish copying. Or when we click on the menu bar and several seconds elapse before the menu appears. Or when the Mac crashes. And crashes again. And again.

Did we mention the BeOS' stability? Although the system software we tested was alpha, it almost never crashed. And when it did, it was rare that anything other than the offending application was affected. The rest of the system, and other applications, stayed up and running.

Another intriguing feature of the BeOS is its built-in database. A hybrid of relational and object-oriented technology, the database is a system resource both the OS and applications can take advantage of. For example, the BeOS' file system makes extensive use of the database. Information about files' names, types, creators, creation and modification dates, and so on is stored in the database. This makes the Be Browser's Find command return results in the blink of an eye. It also enables queries to be live: If a filename changes or new files are

created, query results update automatically.

The BeOS also uses its database to keep track of contact information. Called People, this capability enables the BeOS to store names, addresses, phone numbers, and e-mail addresses. Be uses People to provide an easy way to address e-mail messages: All you have to do is drag a People icon to the message's address field. Third-party applications can also access and extend this information.

The BeOS / elements of an interface

THE BEOS USER INTERFACE borrows heavily from other graphical user interfaces, including those of the Mac OS, Windows 95, and the NeXT OS. It also contains some interesting original ideas. Here is a look at some of its highlights.

p. THE DOCK

Although the BeOS doesn't support placing icons directly on the desktop, the dock serves a similar purpose. Dragging an icon to a slot on the dock creates an alias that can be used to quickly access that icon's program. Dragging an icon from a Be Browser window onto a folder icon on the dock moves or copies the item to the corresponding folder.

o. THE CPU MONITOR

Although the BeOS runs quite well on systems that contain only a single processor, it is optimized for two processors. This utility lets you watch load balancing when two processors are available. You can also use it to turn one processor or both processors off. (Yes, turning off both CPUs crashes the computer.)

n. MULTIPLE-ITEMS INDICATOR

If you drag several items to the top right corner of the same slot in the dock, the corner will display a dog-ear. Clicking on the dog-ear gives you access to the items that share the slot.

m. MINIMIZED WINDOWS

Double-clicking on the tab of any window minimizes the window so that only the tab remains visible. You can move tabs wherever you like on the screen.

l. TRASH CAN

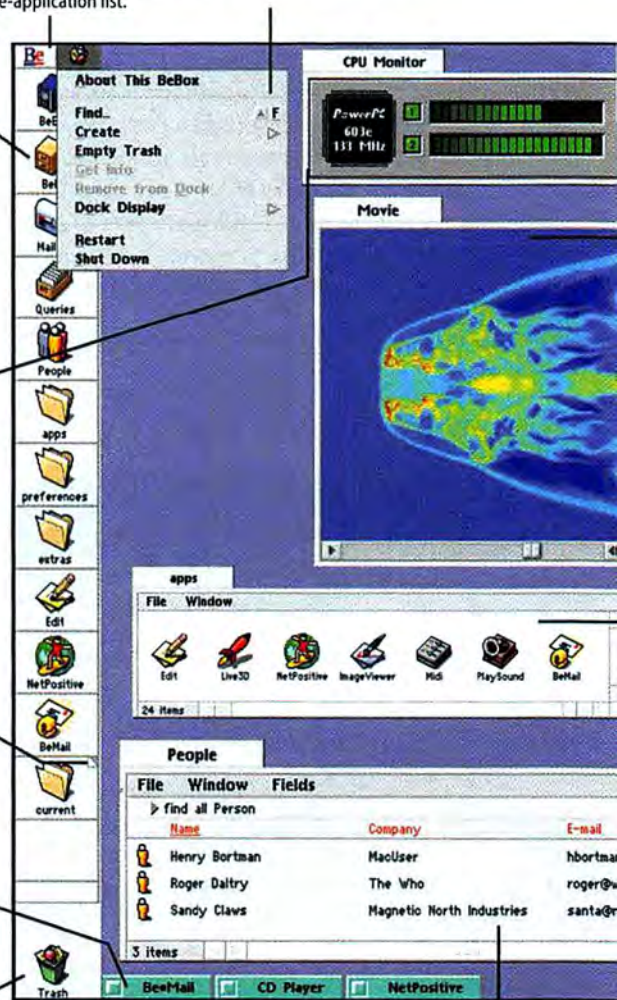
Be's Trash behaves much as you'd expect: Dragging files to the Trash removes them from their previous location on a disk, but you must empty the Trash to delete them.

a. THE APPLICATION LIST

Similar to the Mac's System 7 application menu is the BeOS' application list at the top left of the desktop "dock." Clicking on the Be logo reveals the active-application list.

b. THE MAIN MENU

Clicking at the top right of the dock reveals a menu that contains primary application commands. Menus in the BeOS are sticky: They stay down until you make a selection or click outside them. Menus can be invoked by keystrokes, and most menu commands also have shortcuts.



k. PEOPLE

The BeOS contains a built-in database that is used by both the file system and the built-in e-mail application, BeMail. People is a database that contains records that store names, addresses, phone numbers, e-mail addresses, and the like, which BeMail can access for routing mail. You can address a mail message by dragging People icons into the message window's address fields. Information in the People database is also available for use by other applications.

tabs. Double-clicking on a window's title tab minimizes the window so that only the tab is visible (à la Copland's promised Drawers feature).

But although most of the requisite elements are present, Be appears to have made some curious omissions and a few bizarre choices. For example, even though there is a desktop, you can't put icons on it. Instead, Be has placed a NeXT-OS-like dock on the left side of the desktop, to which you can drag

aliases of files and folders for easy access. But the dock's capacity is limited. Meanwhile, most of the screen's real estate remains unavailable for drag-and-drop operations.

Then there's Be's approach to menus. There is no universal menu bar at the top of the screen like the Mac's. No problem there. But it seems as though Be couldn't quite make up its mind about what it wanted to do about menus. At the top left of the

dock sits a main menu. It changes as you switch among applications.

In addition, many applications have menus in each window. These are supposed to contain commands specific to the contents of the window. We're skeptical about how well this partitioning scheme is going to work in a complex application. In the limited set of example programs Be currently ships with its OS, there appears to be no consistent set of rules that govern which commands can be found where.

c. BE MOVIES

The BeOS supports playback of CinePak QuickTime movies. In fact, it is possible to play four or more 320-x-240-pixel movies simultaneously without dropping a frame.

d. INCLUDED APPLICATIONS

The BeOS ships with several applications and utilities, including a Web browser. The icons for a few of them are shown here.

e. SIMULTANEOUS TASKS

The BeOS lets you initiate as many simultaneous file-copying operations as you like. You can, at the same time, empty the Trash, launch applications, create folders, move windows around on the screen — and more.

f. WINDOW MENUS

The BeOS takes a unique approach to menus. Whereas each application has a main menu accessible from the icon at the top right of the dock, many windows also have menus for manipulating their contents.

g. QUERIES

Because the Be file system uses the OS' built-in database, queries are powerful, fast, and live. If, for example, you were to create a new file that contained the word *sound* in its name, it would instantly appear in this query-results window.

h. PROPORTIONAL THUMBS

Unlike the Mac OS, which uses fixed-sized "thumbs" in its scroll bars, the BeOS uses proportional thumbs that provide a visual clue of how much of a window is not visible. If you prefer fixed-sized thumbs, you can elect to use them instead.

i. MOUNTED VOLUMES

Rather than appearing on the BeOS desktop, mounted hard-disk and CD-ROM volumes appear within a window in the Browser, the BeOS equivalent of the Mac OS' Finder.

j. LIVE3D

Although DR8 of the BeOS doesn't support QuickDraw 3D, it does offer developers a set of 3-D APIs, known as the 3D Kit. The Live3D application bundled with DR8 is a demonstration of these built-in 3-D capabilities.

STILL TO COME

The BeOS has other shortcomings as well. At this point, it has no color management, for example. It doesn't currently support double-byte languages, such as Japanese and Chinese, or localization of the OS for French, German, Spanish, and so on — which makes building an international market a bit of a challenge. It also has no scripting language, nor does it have anything nearly as robust as the QuickTime Media Layer for managing media.

All these are problems that Be says can be solved with capabilities already present in the OS. Making marketing claims and delivering the goods, however, are two different things. The question remains how — and when — Be will actually come through with solutions to these problems.

And then there are the issues Mac users will find particularly vexing. The BeOS version we tested couldn't recognize Mac-formatted floppy or hard disks. In fact, you can't use the Mac floppy-disk drive at all, even with BeOS-formatted floppies. Be doesn't yet have a driver for it. The only printer the DR8 release of the BeOS currently supports (an HP LaserJet IIp or compatible) requires a parallel connection. Macs don't have parallel ports. So no printing either. And Be's contextual-menu feature requires a two-button mouse, which the Mac doesn't support. So Mac-o-philes can forget about contextual menus, at least for now.

To be fair, dealing with these problems is high on Be's priority list and you can expect the company to solve them before any widespread distribution of the Mac version of the OS occurs.

Then, of course, there's the question of applications. There are hardly any. That, too, will change. But at press time, only a few vendors were willing to go on record as developing for the BeOS. Among these were WebStar, working on a BeOS-savvy version of its Web server, and a company developing an installer. Adobe also supposedly is working on a version of Photoshop for the BeOS, but at press time, it had not committed to shipping it.

Even with all these problems, every one of us at *MacUser* who worked with the BeOS was left with a similar impression. If we could get our daily work done on the BeOS, we'd all have BeOS-enabled Macs in no time.

We may be a long way from that day. But one thing is very clear: With the arrival of the BeOS on the Mac, developers are looking at the BeOS more seriously — and so are Mac users.

True, Windows NT's user interface and APIs aren't as elegant, extensive, or powerful as the Mac's. However, many people are willing to trade these things for stability and performance. Weary of Type 11 errors, users are starting to take notice of headlines that say things about NT 4.0 such as "Never Reboot Again!"

NT is not the only thorn in the Mac OS' side. With or without Apple's blessing, Be is moving forward with its own plans to support its OS on Power Macs and Mac OS clones. Come January, Be will simultaneously come out with its developer release 9 for BeBox hardware and most Power Macs and Mac clones. Power Computing will begin shipping the BeOS with most of its systems, enabling users to test-drive it. Once thousands see how much power is locked inside their Macs, the cry for Apple to modernize the Mac OS will be deafening.

Be is also investigating ways to enable users to run existing Mac

applications on the BeOS. Most of these methods involve some kind of "virtual machine," an emulated Mac environment that runs within the BeOS. In many ways, it's similar to how Apple planned to support Mac apps under Copland. But whereas Copland would have offered developers little in the way of advanced OS features, the BeOS offers all the advantages of a modern operating system.

Even more interesting is the possibility that the BeOS could be the ticket to the Mac's future success. It's no secret that Be is open to the possibility of a merger of the Mac OS' APIs with Be's solid OS foundation. But that will require Apple to pony up to the BeOS bar.

Henry Bortman is *MacUser's* technical director and (former) chief Mac OS advocate; Jeff Pittelkau is director of MacUser Labs and wishes he could figure out how to get Excel running on his BeBox.

The Verdict: Just Be

SO HERE WE ARE, two months after the passage of Copland and Gershwin into the dustbin of history, without a viable Mac OS road map. There's a good reason for this. With Gershwin, Apple had the right idea. A truly modern, from-scratch OS that still carried with it the things that make the Macintosh experience so great but that did not shackle itself by trying to be compatible with the Mac OS. Unfortunately, Apple put all its resources into making Copland happen, an OS effort that attempted to keep huge parts of the archaic Mac OS intact while trying to provide some modernization. The result:

It didn't work. It's hard to make dumb ideas work. And Apple has yet to articulate a new strategy, because it's also hard to replace a dumb idea you've labored so hard to make into a smart one.

The BeOS is not dumb. It's what a '90s operating system should look like. Because of its modern architecture, it is capable of fully exploiting a PowerPC processor — on identical hardware, it can outperform the Mac OS many times over.

However, before you take all your Mac OS logo wear and pencil in "Be," you should know that the BeOS is still in its infancy. The list of capabilities missing from the BeOS — capabilities the Mac OS does provide — is long: QuickTime, QuickDraw 3D, QuickTime VR, QuickTime Conferencing, Macintosh Drag and Drop, ColorSync, QuickDraw GX, OpenDoc, plug-and-play hardware and networking, not to mention the Macintosh interface itself. The problem is, all that brilliant technology is choking on the Mac's antiquated OS foundation.

However, there exists an alternative to doing a ground-up rewrite that, by even the most optimistic estimates, could take years: Apple could graft the technologies that are its crown jewels onto an already existing modern OS foundation, a foundation with both a modern microkernel and a modern toolbox. The BeOS is just such a system.

To be sure, this approach would leave Apple with the same compatibility problems that a Gershwin-like rebuild of the Mac OS would have caused. But Apple has already shown that it can manage such a transition. Just look at the switch from 680x0 to PowerPC processors. That transition ranks among Apple's greatest accomplishments. How did it solve the problem of incompatibility between existing 68K-based apps and the new PowerPC processors? With an emulator. A similar approach, known as a "virtual machine," would work for shifting the operating system to a more efficient, more powerful foundation. During the transition period, old-style apps within the virtual-machine environment would continue to run as they always have. Most

what's NOT

- **No icons on the desktop.** Although the BeOS has a dock where you can park icons, you can't put icons onto the desktop.
- **No color management.** The BeOS' lack of color management is going to make winning over prepress professionals hard.
- **Limited printer support.** DR8 of the BeOS for Mac doesn't support printing. That will change by the time DR9 ships, but it's not clear how soon robust drivers will be available.
- **No easy-to-use file sharing.** OK, so the Mac's file sharing isn't all that easy to use. But it sure beats typing in arcane UNIX commands.
- **No hierarchical list view.** The only way to see what's inside a folder is to double-click on it. Shades of System 6.
- **No help system.** And none on the drawing board.
- **Limited font support.** At present, the BeOS supports only TrueType fonts. PostScript Type 1 support is high on the to-do list.
- **No applications.** No doubt this state of affairs will change. How quickly is the question.

likely they would have only limited ability to take advantage of the improved OS foundation. But they would work.

Meanwhile, as developers write new versions of their applications, they will begin to take advantage of the new OS architecture. Over time, fewer and fewer legacy apps will exist, just as today it's hard to find an application that isn't PowerPC-native.

The merger of the BeOS and the Mac sounds pretty compelling to us. The BeOS' multimedia-savvy design reminded us of the things that made using the Mac OS so exciting in the first place. Only Apple knows all the factors that go into deciding where to go from here. So, if Apple's got a better idea for modernizing the Mac OS — before the new millennium — we'd love to hear it. Otherwise, the BeOS looks like the best path to keeping the Mac OS competitive and interesting well after 1999.

what's HOT

- **Astonishing speed.** Running the BeOS, you realize how fast PowerPC processors really are.
- **Lightning-fast queries.** The BeOS has a built-in database that the file system uses for storing indexes. Consequently, the BeOS Find command gives you nearly instantaneous results, which update dynamically.
- **Multiple simultaneous file copying.** You can initiate multiple file copies, launch applications, and empty the Trash all at once.
- **Nonmodal Open and Save dialog boxes.** In the BeOS, an Open or Save dialog box is just another window.
- **Context-sensitive menus.** A promised feature of Mac OS 8, context-sensitive menus are already built into the BeOS.
- **Extensive keyboard control.** In the BeOS, any menu can be invoked from the keyboard and most menu items have shortcuts.
- **Ability to minimize windows.** If you double-click on a window's tab, the window will collapse and only the tab will remain visible. If you double-click on the minimized tab, the window reopens.
- **Built-in e-mail capabilities.** BeMail is a full-featured e-mail program that uses the BeOS' built-in database for easy addressing.

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and that's that!

Chris Farley
Goes Ninja

Ransom's
Delroy Lindo

Crash Test Dummies &
311 Live

System Requirements

Mac Operating System	System 7.1 or greater
CPU Type & Speed	68040 25MHz
Hard Drive Space	2 MB
Memory	8 MB (5000K free)
Graphics	640x480x256
CD-ROM Speed	2x
Audio	8 BIT (16 Preferred)
Other Needs	QuickTime™ 2.1 Sound Manager 3.1 (both included)



9

5MU2

MUSCLE

**PUMPED-UP
MULTIPROCESSOR
SYSTEMS MAKE
FAST WORK OF CPU-
INTENSIVE TASKS. THAT'S
THE PROMISE, ANYWAY.
MACUSER LABS FINDS
OUT WHEN AND HOW
WELL THESE NEW
MP MACS DELIVER.**



COMPUTING SPEED IS LIKE MONEY in the bank — you can never have enough, especially if you perform processor-intensive tasks. For years we've been hearing that MP (multiprocessor) machines are the answer to all our speed woes, but until recently, we've had little more to go on than hype and white papers.

That's changing. In the last six months, MP Mac OS systems, as well as the special application software they require, have become a reality, thanks to DayStar Digital's engineering prowess. Working closely with Apple, DayStar first extended the Mac OS by developing a multiprocessor API (application-programming interface) that has become the standard for all third-party application-development efforts. Simultaneously, on the hardware front, DayStar debuted its line of Genesis MP machines. The final missing piece — application software designed to take advantage of MP machines — is now falling into place.

PHOTOGRAPHY / STEVEN UNDERWOOD

MACS

BY DAVID BIEDNY AND NATHAN MOODY

GenesisMP



 DAYSTAR
DIGITAL

As our tests prove, MP systems running application software compiled to take advantage of the presence of more than one processor can deliver significant speed gains over single-processor systems. However, as we went to press, the list of shipping MP applications was disappointingly limited, although it does include those that benefit most from MP: processor-intensive multimedia and imaging applications such as Adobe Photoshop, After Effects, and Premiere. When active, Macintosh MP works transparently — applications that can take advantage of multiprocessing do so, whereas others run just as they would on a single-processor system.

One caveat: Don't expect across-the-board speed gains with multiprocessing applications. Only specific operations currently take advantage of MP, and in some cases, they aren't the ones that need it the most. Furthermore, not one key business application currently supports MP, nor are any slated to anytime soon. We hope this situation will be remedied in the next year — MP speed enhancements would be a boon for large-spreadsheet calculation and massive-database searches and sorts as well as for busy Internet servers.

TOWER OF POWER

The hardware side of the MP coin is impressive. The DayStar Genesis MP is one of the fastest and most powerful Mac OS systems we've seen to date. It comes in several configurations — with four 150-MHz PowerPC 604e processors or containing two or four 180-MHz PowerPC 604e processors. As we went to press, systems with 200-MHz PowerPC 604e processors were ready to ship. As you'd expect of a premium system, the Genesis MP comes at a premium price. The base Genesis MP 720+ sells for \$8,499 — that's without RAM, a storage device, or a video card. The Genesis MP can accommodate a maximum of 768 MB of RAM, using 64-MB DIMMs, or 1.5 GB of RAM, using 128-MB DIMMs. A 350-watt power supply, much larger than that of the Apple Power Macintosh 9500, allows the Genesis MP to drive a full load of PCI cards (six) and multiple internal drives. In our tests, SCSI peripherals worked without a hitch. The machine's optional

internal RAID disk array and SCSI accelerator (an ATTO Fast-and-Wide SCSI-2 PCI card) provide enough data-throughput speed to meet the requirements of even the most-demanding, broadcast-quality digital-video and -audio applications. Photoshop hums along as well, using the array for either scratch- or data-disk space.

The Genesis MP is also the most expandable Mac we've seen. Its large metal chassis is designed to hold as many as seven 3.5-inch drive mechanisms and two 5.25-inch devices (one 5.25-inch bay holds an internal CD-ROM drive). The system's industrial-strength metal enclosure is solidly constructed, and by removing the side panel, you gain direct access to the internal drives, cards, and RAM slots. It may be loud (multiple internal fans keep the system cool), large, and heavy, but other vendors would do well to look to the Genesis MP for some smart hardware-design ideas.

The best part of the Genesis MP's expandability is the location of the four main processors on a daughtercard, which plugs into the main motherboard. According to DayStar, upgrading the entire system to faster processors is simply a matter of unplugging the daughtercard and replacing it.

During the course of our testing, we did uncover one quirk — with virtual memory enabled, the Genesis MP uses only one of its processors, effectively disabling the other three. Although it makes good sense to have a ton of RAM for the types of applications most Genesis MP owners will be using, the inability to use virtual memory is a limitation we'd like to see addressed in future revisions of MP system software.

IN THE CARDS

In addition to the Genesis MP systems, DayStar also offers the \$1,499 nPOWER 360+, a multiprocessor upgrade card equipped with two 180-MHz 604e processors (Apple sells a preconfigured multiprocessing Power Macintosh — the Power Mac 9500/180MP — which consists of a Power Mac 9500 equipped with DayStar's nPOWER 360+ card). The dual-processor card is designed for Power Macintosh 7500, 7600, 8500, and 9500 base systems (it's

Photoshop on Steroids / MP systems offer obvious speed advantages for image processing



PROCESSOR-INTENSIVE TASKS IN PHOTOSHOP get a significant speed boost with an MP machine, compared to even the fastest single-processor Mac OS system. In our tests, we used a 50-MB image created with Adobe Photoshop 3.0.5. We timed how long it took to rotate the image clockwise .3 degrees, feather a selected portion of it, apply the Unsharp Mask filter at a setting of 2.3 pixels, change the color mode from RGB to CMYK, and resize the image to 50 percent. Each system had 256 MB of RAM, and Photoshop was allocated 91 MB of RAM.

	ARBITRARY ROTATE	FEATHER SELECTION	UNSHARP MASK	MODE CHANGE	RESIZE
DayStar Genesis MP 720+	21.2	10.4	24.4	7.2	8.1
Apple Power Mac 9500/150 with DayStar nPOWER 360+	27.0	13.1	35.1	13.5	11.1
REFERENCE SYSTEMS					
Power Computing PowerTower Pro 225	33.8	16.7	48.8	18.4	19.3
Apple Power Mac 9500/180	39.5	19.8	58.3	22.5	22.4
	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER

MP WORKOUT / how we tested

TO FIND OUT WHAT KIND OF SPEED GAINS imaging pros can expect from MP systems, we tested the DayStar Genesis MP 720+, a quad-processor machine, and the Apple Power Mac 9500/150 equipped with DayStar's nPOWER 360+ dual-processor upgrade card (this system is also available preconfigured from Apple as the Power Mac 9500/180MP), using a variety of MP applications. We compared the results with those of two custom-configured single-processor systems, Power Computing's PowerTower Pro 225 and an Apple Power Mac 9500/180.



DayStar Genesis MP 720+

Processors: four 180-MHz PowerPC 604e's
RAM: 256 MB
Hard drive: 2-GB Quantum
Price as tested: \$11,995 (estimated street)



Apple Power Mac 9500/150 with DayStar nPOWER 360+

Processors: two 180-MHz PowerPC 604e's
RAM: 256 MB
Hard drive: 2-GB IBM
Price as tested: \$6,850 (estimated street)



Power Computing PowerTower Pro 225

Processor: 225-MHz PowerPC 604e
RAM: 256 MB
Hard drive: 2-GB IBM
Price as tested: \$6,975 (estimated street)



Apple Power Mac 9500/180

Processor: 180-MHz PowerPC 604e (on Newer Technology Maxpower 180-MHz upgrade card)
RAM: 256 MB
Hard drive: 2-GB IBM
Price as tested: \$5,930 (estimated street)

also certified to run on UMAX clones). A single-PCI-slot card, the nPOWER 360+ has small heat sinks that help keep the temperature down inside the machine.

Easy to install, the card includes the necessary system software to enable MP. By swapping out a Power Mac's single processor with two faster ones, owners of DayStar's card will not only be able to take advantage of MP applications but they'll also be able to run single-processor applications faster.

Another plus is that the card uses the RAM on the motherboard of the host computer, a welcome change from processor upgrades that require new RAM chips. As with the Genesis MP, however, you can't use virtual memory when running MP applications.

Whether you pick a four-processor or a two-processor Genesis MP system, you may be expecting two processors to be twice as fast as one and four processors to be twice as fast as two. But our tests show that's not always the case — although the speed of some operations may fit that equation, the speed of others will not. That's because system overhead takes a bite out of MP speed gains. Looking at our test results, it's clear the Power Macintosh with the nPOWER 360+ was never able to perform twice as fast as the Apple Power Mac 9500/180 reference system. Moreover, although the Genesis MP 720+ took about half as long as the dual-processor system in some of our tests (largely 3-D-rendering tasks), it was not that fast in all of them.

MP APPLICATIONS

Like PowerPC Macs, MP systems will require extensive and widespread software support before they can go mainstream. For an application to benefit from MP speed gains, it must be compiled specifically to address multiple processors.

To date, the list of applications modified to take advantage of multiprocessing is not as long as we would like, but it is growing (see the "Multiprocessing Applications" sidebar). Not surprisingly, the first multiprocessing applications are designed for the imaging and multimedia arenas. That makes sense, given that the speed benefits of multiprocessing are most valuable to applications that process or produce large amounts of dynamic data, such as audio, video, high-resolution images, and rendered 3-D images.

Perhaps the best reason to consider a multiprocessor system is the use of Adobe Photoshop. Of all the programs we tested, Photoshop delivered the most-significant speed gains across the board. Prepress and print-production professionals who make a living using Photoshop will find that switching to a multiprocessor system can boost overall productivity by at least 200 percent over use of a single-processor Mac of the same chip type and speed.

Many of the most-time-consuming Photoshop operations — image resizing and resampling, sharpening and blurring, filters, and color-mode conversions — take full advantage of MP. As is to be expected, speed improve-

ments are most obvious when you're working with large files and multilayered images.

Keep in mind, however, that Photoshop multiprocessing goes hand in hand with having prodigious amounts of RAM and using solid scratch-disk allocations. If you're considering getting a DayStar Genesis MP or an nPOWER 360+ card for a Power Macintosh, you should also think about beefing up your system's RAM and its hard-disk configuration. One reason the DayStar Genesis MP is such an amazing Photoshop platform is that it can accommodate internal RAID disk arrays. DayStar offers the ATTO Fast-and-Wide SCSI-2 accelerator card as an option, and third-party accelerator cards, such as the StreamLogic JackHammer, are also available.

Multiprocessor systems are also available on the Windows NT side of the fence. However, Photoshop users should know that in informal Photoshop tests comparing a dual-processor Windows NT workstation with the Genesis MP 720+, we found that the Genesis MP was much more stable when handling large files that frequently used the scratch disk, even when the amount of scratch-disk space was equivalent on the two systems. Moreover, Mac OS systems offer additional advantages for running Photoshop — color-management and calibration software and hardware options available for the Macintosh continue to outpace those available for Windows NT machines. For example, system-level software such as ColorSync and hardware accessories such as the Light Source ColorTron currently have no equivalents on the Windows NT platform.

Even more time-consuming than performing Photoshop operations is rendering video, 3-D images, movies, and special effects. Whether you're working with a 2-D animation or a complex textured 3-D scene, rendering it will require all the processing power your system can muster. Consequently, much of the multiprocessing-application-development effort is focusing on tools for graphics, video, animation, and Web-media creation and editing.

Bread-and-butter apps for most media developers are Adobe Premiere and Adobe After Effects. After Effects was

THE MAC OS / sticky wicket for MP?

THE FUTURE SUCCESS OF MULTIPROCESSING on the Mac depends largely on Apple's Mac OS strategy. DayStar Digital has done its part by re-engineering daunting chunks of low-level Mac hardware code and delivering a powerful MP platform. However, it will take serious development efforts on Apple's part to make MP more than just a blip on the Macintosh radar screen.

With software developers already fighting the lure of the Windows market, how motivated can they be to support MP on the Mac if Apple fails to move quickly to build MP specifications into the Mac OS?

As it stands right now, Windows NT and UNIX are well ahead of the Mac OS when it comes to MP. A large chunk of Windows NT system-level services, for example, are multithreaded, whereas none of the Mac's are. That means system overhead takes a much smaller bite out of MP speed gains under Windows NT than under the Mac OS. On the application side, Autodesk's 3D Studio Max makes exquisite use of MP on Windows NT by supporting multithreading down to the pixel level. The system-level MP services of UNIX (such as distributed rendering and image processing) are remarkably robust and available to all applications.

Among Mac OS components, QuickDraw 3D is one that could greatly benefit from MP. An MP version of QuickDraw 3D will get users much closer to real-time 3-D shaded rendering. According to Apple, QuickDraw 3D 1.5 (scheduled for release in early 1997) is slated to have MP support, which will go a long way toward speeding up shaded animated previews of images that have transparency and textures.

Because QuickDraw 3D uses a complex processor-intensive rendering process, multiprocessing is perfect for speeding up interactive rendering and display of 3-D objects. Apple claims that QuickDraw 3D 1.5 will support distributed rendering, which will let users of networked computers collaborate on rendering large scenes, as well as parallel rendering, which will allow each processor in an MP Mac to work on a portion of a rendering job.

With so much at stake, we hope Apple will make MP support a clear objective for all Mac OS services, not just QuickDraw 3D. Then developers and users will have a solid reason to turn to the Mac for MP, rather than to Windows NT and UNIX platforms.

the second multimedia program out of the gate (after Photoshop) to offer multiprocessing support. Premiere followed closely on its heels. However, if you're a Premiere or After Effects user considering upgrading to an MP system, it's important to note that not all After Effects and Premiere operations are accelerated. For example, After

Pumped-Up Productivity / imaging applications get a boost with MP



PHOTOSHOP ISN'T THE ONLY processor-intensive application that benefits from an MP system. In most of our tests with other MP applications, the MP systems blew by the single-processor machines. Unfortunately, QuickTime speed improvements won't happen until application-software developers make further modifications to their MP code to support QuickTime multiprocessing.

	ELECTRICIMAGE CAMERA* RENDER	ADOBE AFTER EFFECTS RENDER	STRATA STUDIOPRO BLITZ RENDER	QUICKTIME 2.5 CINEPAK COMPRESSION
DayStar Genesis MP 720+	80	197	185	146
Apple Power Mac 9500/150 with DayStar nPOWER 360+ REFERENCE SYSTEMS	135	224	310	155
Power Computing PowerTower Pro 225	179	217	363	129
Apple Power Mac 9500/180	217	274	445	160
	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER

*Beta.

One Stone, Two Birds / MP delivers limited preemptive multitasking to the Mac

IN THE BATTLE BETWEEN Windows and the Mac OS, multiprocessing gives the Mac a definite edge. Although Windows NT can take full advantage of multiple CPUs, its less capable but more widely used sibling, Windows 95, can't — and won't. What's more, the MP API developed jointly by Apple and DayStar also gives MP applications a form of *preemptive multitasking*, a capability contained in Windows 95 but not in the Mac OS. However, the scope of this preemptive capability is limited to tasks from MP applications; other applications, as well as the basic Mac OS itself, are still hobbled by their reliance on the far less efficient *cooperative multitasking*.

To understand cooperative multitasking, picture a drinking fountain besieged by a bunch of thirsty kids. Each kid, representing an application, can

hog the drinking fountain (the main CPU) for as long as he wants — even when he's not drinking, or directly accessing the CPU. But in preemptive multitasking, the operating system becomes a disciplinarian, lining up the kids in an orderly queue and allowing each a specific amount of time at the drinking fountain. If a kid is still thirsty at the end of his allotted time, the OS sends him back to the end of the line while another kid gets a turn. The catch with Mac MP and its limited form of preemptive multitasking? Only certain MP application processes, such as applying filters, can benefit from multiple processors. The remaining processes, related to user interface and I/O, must run on the main CPU. That means MP applications may end up waiting in line anyway while a non-MP application hogs the main CPU. / RIK MYSLAWSKI

A. MP APPLICATIONS. To take advantage of an MP Mac, an application must be adapted to use the Apple/DayStar MP API. Once adapted, the application can designate certain processes for MP.

C. TASKS. MP applications break down MP operations into independent processes called tasks.

D. RUN QUEUE. Tasks wait for the first available processor in the run queue.

E. MULTIPROCESSING CPUS. Theoretically, there's no limit to the number of CPUs in any one Mac, but any CPU not designated as the main CPU can process only tasks sent from MP-aware applications.

F. SCHEDULER. Running on each CPU — including the main CPU — is a scheduler. Each scheduler competes with the others to grab a task from the front of the run queue; as soon as a task is grabbed by a scheduler, it becomes unavailable to the others, in a process called *atomic queue removal*.

G. 10-MILLISECOND TIMER. If a task has not completed its work on any given processor in 10 milliseconds, it is *preempted* — sent back to the end of the run queue, to await another turn.

H. COMPLETED TASK. When a task has been completed — whether or not its allotted 10 milliseconds have passed — it signals to its application that it is done (the application has been either waiting or doing other work) and sends the application the completed data.

I. UNCOMPLETED TASK. When a task isn't completed in its allotted 10 milliseconds, it's returned to the run queue.

B. MAC OS AND NON-MP APPLICATIONS. The Mac OS and applications that haven't been adapted to use the MP API must perform all their processing in the main CPU — they ignore all other CPUs.

K. NON-MP PROCESSES. Processes running on the main CPU act as if they were running on a single-processor Mac; they're cooperatively multitasked and don't enjoy the benefits of preemptive multitasking.

J. MAIN CPU. Although the scheduler running on the main CPU can access the run queue, allowing the main CPU to share MP chores, the main CPU is normally too busy dealing with the OS and other applications to do so.

DayStar Genesis MP 720+ / the ultimate in speed and expandability



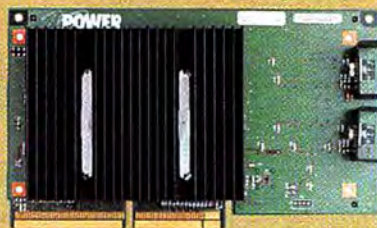
INSIDE STORY

By removing the Genesis MP's side panel, you gain easy access to every system component. The machine's processors are contained on a daughtercard that's easy to swap out when faster chips become available. The roomy chassis can accommodate up to seven 3.5-inch hard drives and two 5.25-inch devices. Six PCI slots offer plenty of expansion options.



QUAD-PACK

A daughtercard equipped with four 180-MHz PowerPC 604e processors powers the Genesis MP 720+.



DYNAMIC DUO

Owners of the Apple Power Mac 7500, 7600, 8500, and 9500 can equip their machines for multiprocessing by installing DayStar's nPOWER 360+ dual-processor upgrade card.

Effects projects that make heavy use of masked layers do not get the same speed boosts as projects that use the program's special-effects filters. And although Premiere demonstrates speed improvements with an MP system when rendering transition and filter effects, very little of the project-construction process is accelerated. Both programs miss out on speed boosts for compressing final QuickTime output, due to limitations in the way QuickTime itself runs in MP mode. Although QuickTime 2.5 is billed as having multiprocessing support, the current implementation requires special modifications to QuickTime applications, such as After Effects and Premiere, in order for QuickTime to take advantage of multiprocessing. In short, none of the current MP applications work in multiprocessing mode with QuickTime.

On the 3-D front, StudioPro Blitz 1.75+, from Strata, is currently the only 3-D program that runs in multiprocessing mode.

The speed boosts you get for ray tracing are impressive, but other tasks, such as opening large images that have complex geometry, don't really benefit.

The beta MP version of ElectricImage Camera we tested demonstrated impressive speed gains, but again, some operations — including some of those involved in rendering — are not accelerated. For example, motion-blur and texture-handling operations — probably at the top of most users' speedup wish lists — aren't accelerated. Nevertheless, the release of an MP version of ElectricImage Animation System is critical for the Macintosh platform, given that the high end of the graphics and imaging market is the clear target for first-generation multiprocessor Macs.

Soon to compete with ElectricImage Animation System on the high end is NewTek's LightWave 3D, an integrated modeling, rendering, and animation program that's popular on the Windows NT



RELATED INTERNET SITES

• **DayStar's Photoshop MP Update**
A complete list of the 173 functions and commands accelerated in the MP version of Photoshop.

• **MP Machines from UMAX**
The scoop on the MP collaboration between UMAX and DayStar.

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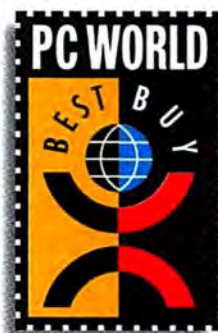
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platform. The initial Mac release, due in early 1997, will boast multiprocessing support. Other Macintosh 3-D staples, such as Specular's Infini-D, Fractal Design's Ray Dream Studio, and MetaTools' Bryce, are also expected to offer MP support in the near future.

Audio-recording and -editing pros will welcome the multiprocessing version of DECK II, Macromedia's popular audio-editing and -mixing program, which should be available by the time this article appears. Unfortunately, though, no MIDI sequencing or notation programs are slated for MP releases. Other applications that have MP versions in the works include Elastic Reality's Elastic Reality, Fractal Design's Painter, Strata's MediaPaint, and Insignia's SoftWindows.

Conspicuously absent from the list of current and planned MP software are frequently used system-software components, such as Open Transport and the Finder; business applications; and server and communications software. True, first-generation MP Macs are specifically aimed at the graphics- and media-development arena and software-development efforts reflect that strategy. But it's also true that these glaring omissions will have to be addressed if Mac MP is to gain a foothold in the corporate workplace.

THE BOTTOM LINE

Given the current lack of MP-aware database, spreadsheet, word-processor, communications, and networking software, users of mainstream business applications have nothing to gain from multiprocessor Macs at this time. Speed-hungry digital artists and imaging professionals, however, would do well to take a close look at the speed advantages multiprocessor machines bring to key processor-intensive operations. Photoshop production artists looking to hot-rod their imaging tasks will be especially happy with what they find — the speed boosts over single-processor systems make MP Macs an attractive option for serious production and prepress work.

Although we used MP machines from DayStar to generate the data analyzed for this article, the company (and Apple, with its DayStar nPOWER 360+-equipped Power Macintosh 9500/180MP) will no longer be the only vendor to offer multiprocessor Mac OS systems. Power Computing has announced its own MP strategy and plans to debut aggressively priced dual-processor systems by the time this article appears. Dual-processor systems from UMAX, also boasting bargain-basement prices to attract more-mainstream buyers, should be available in the same time frame. The result? Prices for MP systems are dropping drastically, and as competition heats up the MP arena, more buyers may be encouraged to come in from the cold. ☞

David Biedny is a multiprocessing multimedia professional who coauthored the first book on Photoshop. Nathan Moody is a San Francisco-based multimedia artist. MacUser Executive Editor Rik Myslewski contributed to this report. MacUser Labs Senior Project Leader Jeff Milstead managed the testing for this report.

MULTIPROCESSING APPLICATIONS*

SHIPPING

Adobe After Effects

Video special effects
Adobe Systems
Mountain View, CA
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415-961-4400
415-961-3769 (fax)
<http://www.adobe.com/>

Adobe Photoshop

Image editing
Adobe Systems
Mountain View, CA
800-649-3875
415-961-4400
415-961-3769 (fax)
<http://www.adobe.com/>

Adobe Premiere

Digital-video editing
Adobe Systems
Mountain View, CA
800-649-3875
415-961-4400
415-961-3769 (fax)
<http://www.adobe.com/>

Canvas

Drawing and image editing
Deneba Software
Miami, FL
800-622-6827
305-596-5644
305-273-9069 (fax)
<http://www.deneba.com/>

CodeWarrior

Software-development environment
Metrowerks
Austin, TX
800-377-5416
512-873-4700
512-873-4900 (fax)
<http://www.metrowerks.com/>

ElectricImage Animation System

(Includes Camera)
Animation and special effects
Electric Image
Pasadena, CA
818-577-1627
818-577-2426 (fax)
<http://www.electrictimg.com/>

QuickTime codecs

QuickTime components
Apple Computer
Cupertino, CA
800-776-2333
408-996-1010
<http://www.apple.com/>

ScanPrepPro

Adobe Photoshop plug-in
ImageXpress
Lawrenceville, GA
770-564-9924
770-564-1632 (fax)
<http://gracenet.com/IX/scanprep.html>

StudioPro Blitz

3-D modeling and animation
Strata
St. George, UT
800-787-2823
801-628-5218
801-628-9756 (fax)
<http://www.strata3d.com/>

PLANNED

Boris Effects

Video special effects
Artel Software
Boston, MA
888-772-6747
617-451-9900
617-451-9916 (fax)
<http://www.artelsoft.com/>

Bryce

3-D landscapes and effects
MetaTools
Carpinteria, CA
800-472-9025
805-566-6200
805-566-6385 (fax)
<http://www.metatools.com/>

DECK II

Audio editing and effects
Macromedia
San Francisco, CA
800-326-2128
415-252-2000
415-626-0554 (fax)
<http://www.macromedia.com/>

Elastic Reality

Morphing and warping
Elastic Reality
Madison, WI
800-642-4122
608-273-6585
608-271-1988 (fax)

Final Effects

Adobe After Effects plug-in
MetaTools
Carpinteria, CA
800-472-9025
805-566-6200
805-566-6385 (fax)
<http://www.metatools.com/>

Infini-D

3-D modeling and animation
Specular International
Amherst, MA
800-433-7732
413-253-3100
413-253-0540 (fax)
<http://www.specular.com/>

Kai's Power Tools

Adobe Photoshop plug-in
MetaTools
Carpinteria, CA
800-472-9025
805-566-6200
805-566-6385 (fax)
<http://www.metatools.com/>

LightWave 3D

3-D modeling and animation
NewTek
Topeka, KS
800-862-7837
913-228-8000
913-228-8001 (fax)
<http://www.newtek.com/>

MediaPaint

Video effects
Strata
St. George, UT
800-787-2823
801-628-5218
801-628-9756 (fax)
<http://www.strata3d.com/>

Movie Cleaner Pro

QuickTime compression
Terran Interactive
San Jose, CA
800-577-3443
408-278-9065
408-278-9063 (fax)
<http://www.terran-int.com/>

Painter

Special paint effects
Fractal Design
Scotts Valley, CA
800-297-2665
408-430-4000
408-438-9670 (fax)
<http://www.fractal.com/>

QuickDraw 3D

API for 3-D graphics
Apple Computer
Cupertino, CA
800-776-2333
408-996-1010
<http://www.apple.com/>

Ray Dream Designer

3-D modeling and animation
Fractal Design
Scotts Valley, CA
800-297-2665
408-430-4000
408-438-9670 (fax)
<http://www.fractal.com/>

SoftWindows

Windows for Mac OS
Insignia Solutions
Santa Clara, CA
800-848-7677
408-327-6000
408-327-6105 (fax)
<http://www.insignia.com/>

Studio Effects

Adobe After Effects plug-in
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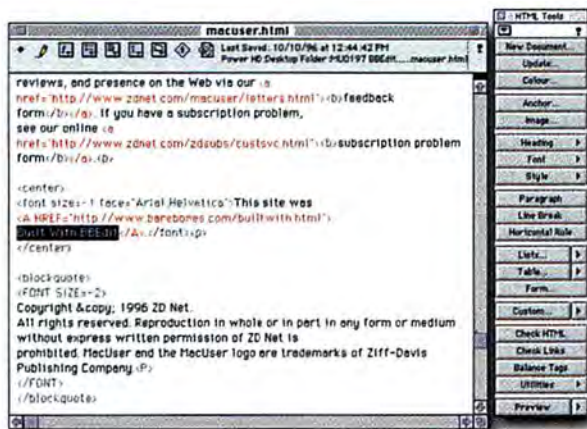
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Designing your own Web site has never been easier. What's hard is choosing the right WYSIWYG Web-page editor. *MacUser* puts six HTML authoring tools to the test.

Creating a Web page used to be a really tough job: Web authors had to learn HTML (HyperText Markup Language) in order to create even the most basic documents. But last year, Adobe released PageMill 1.0, a program that made creating Web pages as easy as creating documents in a word processor.

But PageMill, newly updated to version 2.0, now has plenty of competition in the category it pioneered. In the last year, five more WYSIWYG Web-page editors — AOLpress 1.2.2j, from America Online/PrimeHost; Claris Home Page 1.0, from Claris; golive Pro 1.1, from gonet communication; Netscape Navigator Gold 3.0, from Netscape Communications; and Presto! Personal Page (formerly Concept1's Tapestry 2.0), from NewSoft — have appeared, all challenging PageMill for the hearts and minds of Web-page designers.

If you don't want to learn how to use the dozens of HTML tags, getting one of these programs is a necessity. And even HTML wizards can save time and brainpower by using a graphical tool to design pages quickly. None of these programs can take advantage of every feature of HTML, however — for that, you still need to learn the language and make use of a text editor (see the "Beyond WYSIWYG Web Authoring" sidebar for details).

BY TONYA ENGST

[W Y S I W Y G]



PAGE BUILDERS



On the Table

It requires Olympic-caliber brainpower to visualize how the HTML code for a complex table will be interpreted by a Web browser. Since the only way to create a page-layout-style grid is to use a table, a WYSIWYG table editor is a necessary component of any visual Web authoring tool. If tables are your cup of tea, scratch *golive Pro* and *Presto! Personal Page* from the list of software you consider — neither offers visual ways to create tables.

Selecting groups of table cells is vital to page design, since you often want to apply the same formats to large sections of your table simultaneously. For instance, you may wish to make every cell in a column bold. Only *Navigator Gold* and *PageMill* permit multicell selection, and they both fall short. With *Navigator Gold*, you cannot select by column and cannot apply alignment attributes to multicell selections. *PageMill* permits you to select contiguous bits of rows or columns, but you cannot apply character formats, such as bold text.

All in all, *PageMill* offers the most-robust and -flexible table-

editing options. Features only *PageMill* provides include the ability to insert and delete multiple rows or columns simultaneously and the ability to resize column widths simply by dragging. *PageMill* and *Home Page* both let you advance the cursor from one cell to the next by pressing the Tab key, just as a spreadsheet application does.

Home Page is the only other application we recommend for serious table creation. It's the only program that lets you insert paragraph breaks within table cells, making its tables more readable in browsers that don't support tables. *Home Page's* main failing is that all the columns in a table must be the same width, so tables in the program look different from the way they look when viewed in a Web browser.

AOLpress' table cell sizes cannot be adjusted by percent or by pixel, so the cell sizes are always dependent on the items within the cells. Further, AOLpress requires you to use the mouse for most work, rather than offering any palettes or keyboard shortcuts. Similarly, *Navigator Gold's* table-editing options struck us as awkward; you're forced to use three different menus, and the program offers little in the way of helpful shortcuts.

Unfortunately, none of these programs handle large tables well. *PageMill* and *Home Page* bog down when you create tables larger than 50 x 10 cells, and AOLpress and *Navigator Gold* aren't usable for tables larger than about 30 x 5 cells.

THE BOTTOM LINE

ADOBE PAGEMILL FINALLY HAS SOME STRONG COMPETITION in the field it created. Several new products improve greatly on the features of last year's *PageMill*, version 1.0. But in the meantime, Adobe has upgraded *PageMill* with so many state-of-the-art features that it's still the best in its class.

RATING PRODUCT



Adobe PageMill 2.0



The application of choice for creating glamorous pages, *PageMill* has robust graphical frames and table editors and excellent support for text formatting and browser plug-ins. It's also the only program to offer converters for existing word-processing documents. Its interface could be easier to learn and use, however.



Claris Home Page 1.0

Home Page is a solid, comfortable product that Mac veterans will immediately feel at ease with, without needing to read the manual. Its feature set looks strong, but several of those features are weak.



golive Pro 1.1

If you appreciate working in a designed environment with sensibly set up and arranged dialog boxes, you'll love *golive Pro*, which is truly a joy to work with. Its outline-oriented HTML view makes it easy to learn HTML and create correct code. Unfortunately, the program doesn't support visual table editing.



Netscape Navigator Gold 3.0

Navigator Gold combines all the features of the *Navigator Web* browser with an HTML editing mode. The product is geared toward intranet users who have relatively simple page-creation needs. It doesn't support forms, nor does it support frames, Netscape's own creation.



AOLpress 1.2.2j

AOLpress offers features — such as the ability to have multiple forms on a page, a miniweb for site management, and a link checker — not offered in the other programs. Further, it's a Web browser, so you can browse to pages and immediately start editing them. AOLpress is free, and we recommend it primarily to those for whom the cost savings overrides concerns about a clunky interface and poor table support.



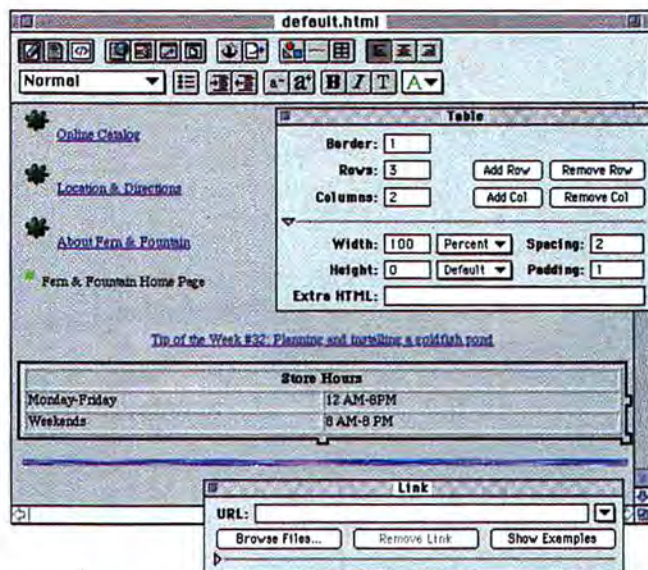
Presto! Personal Page (Tapestry 2.0)

This easy-to-use product fails to support many common HTML features, such as lists, tables, and forms, as well as many character formats.

Forming an Opinion

Laying out the check boxes, radio buttons, and other elements of a fill-in form is another task best done visually. Four of the applications have features for setting up form interfaces, although none of them set up the scripts a Web server needs for processing a form.

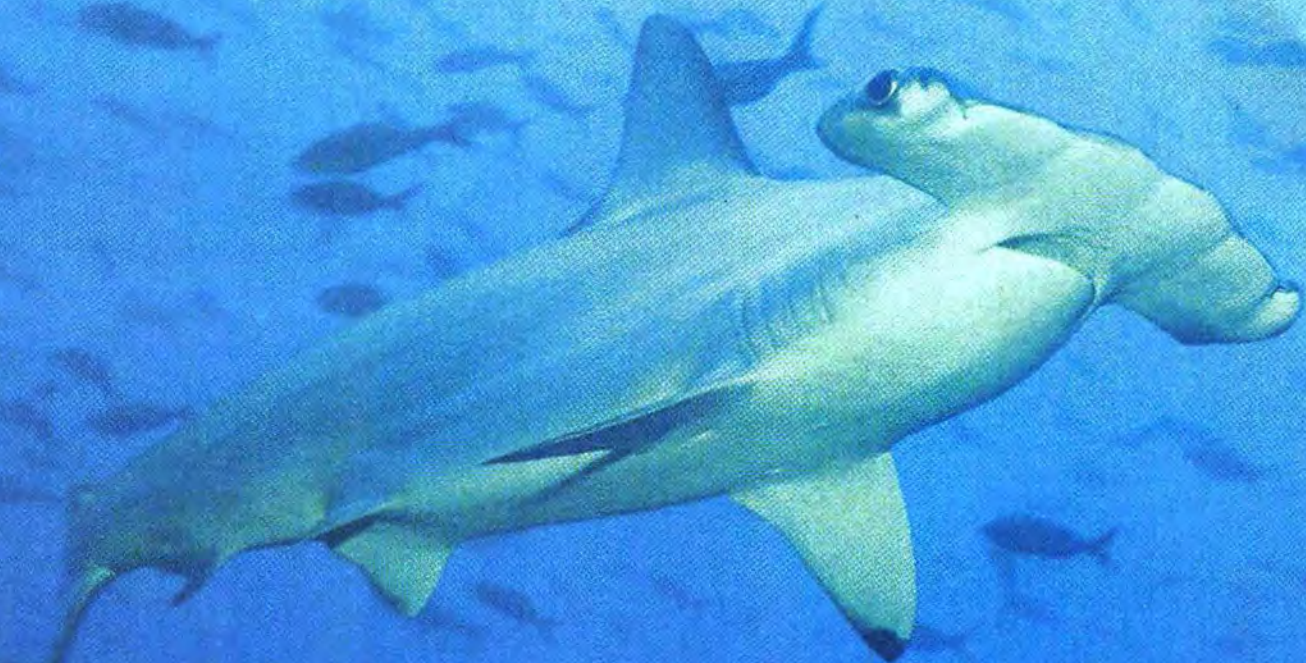
AOLpress takes the lead in form editing, by being the only application we tested that lets you place more than one form on a page. It's also the only one that makes it easy to substitute an image in place of the standard Submit or Reset buttons. AOLpress automatically displays a useful form-element tool bar whenever you're editing a form. Unfortunately, modifying existing form elements is more difficult than



Claris Home Page lets you edit tables graphically; you specify table characteristics in the floating Object Editor palette.

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Ethernet	yes	no	no	yes
Edge-to-edge	yes-13" x 19"	no	no	no
Internal Hard Drive	yes	no	no	yes
Printing Speed	20 ppm	16 ppm	16 ppm	8 ppm
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BEYOND WYSIWYG WEB AUTHORING

WYSIWYG WEB EDITORS protect their users from having to work with HTML tags while creating their Web-page designs. Typically, features in such a program directly map to HTML tags commonly understood by Web browsers. Not all Web authoring software follows that approach, however. (For more information about Web authoring tools, see "The Web Author's Workshop," August '96, page 80.)

Managers of complex Web sites frequently mention **BEdit 4.0.1** (\$119), from Bare Bones Software (617-676-0650; <http://www.barebones.com/>), as their text editor of choice. BEdit is an excellent choice for working with raw HTML code, offering a spelling checker that ignores HTML tags and providing the ability to color tags differently from text. BEdit's HTML extensions streamline coding, and the program offers a sophisticated, multifile search-and-replace feature. It also lets you quickly update boilerplate text within a site and lets you open and save files on remote Web servers via FTP.

Globetrotter 1.0 (\$249) is a word-processor-like document-creation tool from Akimbo Systems (617-776-5500; <http://www.akimbo.com/globetrotter/>). Globetrotter documents can be printed to paper just as easily as they can be

published as Web pages. And you're not limited to one page per document: One Globetrotter document can turn into an entire Web site, with pages created based on page or section breaks and with navigation features added automatically. The program includes editing features common to word processors: a competent spelling checker, a functional thesaurus, a glossary for storing common phrases and correcting typos, and a Replace command that can search and replace based on such criteria as font and style.

For those who know HTML, using Globetrotter to create Web pages can feel like trying to tie your shoes while wearing mittens. Many HTML features can't be specified directly; instead, you must trust Globetrotter to format your documents correctly. But Globetrotter offers exquisite control over some high-end design options. Its tools for creating interactive forms are simple to use and even come with cross-platform CGI scripts that allow a Web server to process the forms automatically. The excellent image-map editor can create client- and server-side maps. The full-featured Picture Options dialog box enables you to add attributes to images and to proportionally scale them. Globetrotter even

offers a dialog box for inserting Java applets.

HoMetal PRO 3.0 (\$159), from SoftQuad International (800-387-2777 or 416-239-4801; <http://www.sq.com/>), began life as a tag-based authoring tool, but with the latest version, it has begun to encroach on visual-authoring-tool territory. Although you can now hide HTML tags and work in a graphical page view, we found that we still spent most of our time working with tags visible. HoMetal PRO is a port from a Windows product, so it doesn't always look or behave like a Mac application should.

World Wide Web Weaver 2.0 (\$89), from Miracle Software (315-265-0930; <http://www.miracleinc.com/>), lets you edit HTML tags directly, but it still tries to approximate the look of a rendered HTML page as much as possible. A shareware version, HTML Web Weaver Lite 3.0 (\$25), is also available, although it offers a pared-down feature set.

One of the favorites in the shareware category is **PageSpinner 1.2** (\$25), from Optima System (<http://www.algonet.se/~optima/pagespinner.html>). This program lets you create Web pages in a view where you can see and edit tags directly. It supports a wide range of features and helps you learn HTML as you go, via its HTML Assistant feature.

it should be. To modify an element, you must take the unexpected route of dragging over it to select it — clicking doesn't work — and then clicking on a button on the tool bar.

If you want to include hidden elements (commonly used for submitting preformatted information or script variables to a server) in your forms, your best option is to use Home Page. However, making a form in Home Page involves choosing elements from an inconvenient hierarchical menu. Most element editing takes place in Home Page's Object Editor palette.

PageMill and golve Pro support forms too, and they have the best form-creation interfaces. In PageMill, the main tool bar displays buttons for inserting form elements, and you can further modify selected elements via the Inspector palette. golve Pro is the only program that suggests intelligent names for groups of buttons (for example, Group1 when other applications suggest such choices as radio102274). To insert a form element in golve Pro, you either choose it from a menu or drag it off a palette into the correct location. Editing golve Pro forms takes place in well-organized dialog boxes that appear when you double-click on the form element. But unlike the other programs, golve Pro forces you to set form text within a dialog box rather than directly within the document window.

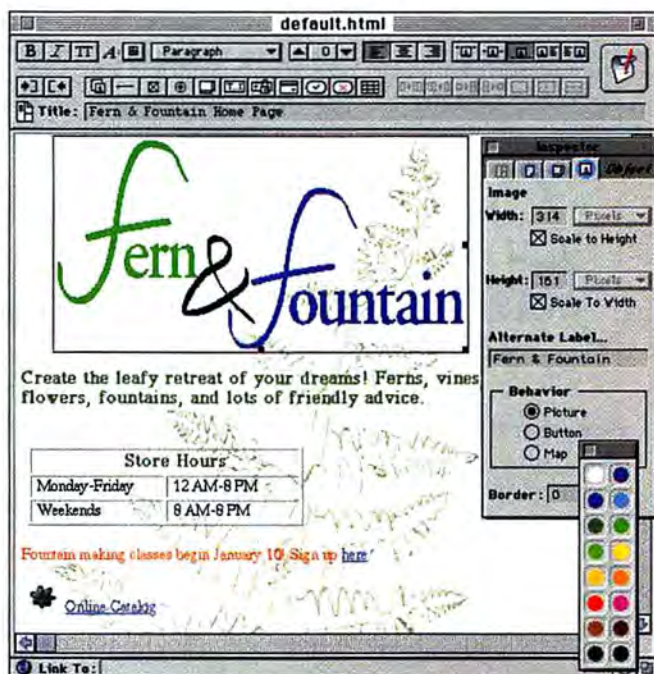
The Frame-up

Three programs support frame sets, a Netscape innovation that lets you place several Web pages in one browser window. Right now, we question the usefulness of frames in Web-site design and caution novices against using them, but for experienced authors, a graphical frame-set tool can be a boon.

That said, PageMill decidedly takes the lead when it comes to frames. Only in PageMill can you create a frame set and edit the set's

pages within their frames. The program's Inspector palette lets you modify frame formats easily. PageMill also provides a clever visual way to set up *targets*, which point out which frame will be modified when a user clicks on a hyperlink.

Home Page and golve Pro offer visual ways of setting up frame



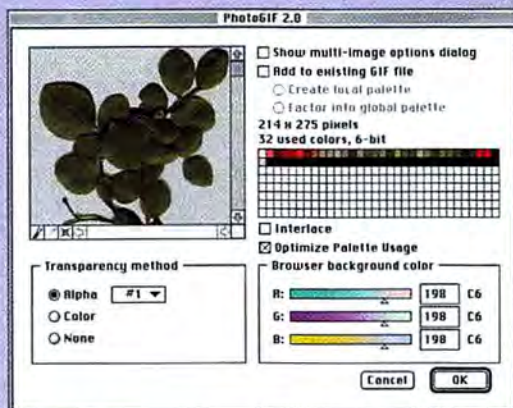
Adobe PageMill offers several floating palettes, including a customizable color palette.

GRAPHIC RELIEF

THE WEB AUTHORING TOOLS we consider in this article make it easy to create graphics-rich Web pages, but they can't help you create those graphics in the first place nor can they effectively get those images out of Photoshop and into GIF or JPEG format. Some third-party tools can make the production of Web graphics easier and keep your images looking as good as possible.

PhotoGIF 2.1 (★★★★; \$45), from BoxTop Software (800-257-6954 or 601-323-6436; <http://www.boxtopsoft.com/>), is a plug-in for Adobe Photoshop that offers a vast improvement over Photoshop's built-in GIF-conversion capabilities. It has a bevy of options, including outstanding control over reducing your images to the 256 colors allowed in GIFs. You can choose to create a custom color palette or select from preformatted palettes, including the color palette used by Netscape Navigator. You can also set image dithering and image interlacing as well as select transparent areas based on either a single color or an alpha channel. PhotoGIF also supports the latest Web-graphics rage, animated GIFs.

3D Web Workshop (★★★★; \$399, \$249 without PageMill bundle), from Specular (800-433-7732 or 413-253-3100; <http://www.specular.com/>), includes Web editions of Specular's LogoMotion 2.0.2 and TextureScape 2.0.2 applications as well as the WebHands clip-art collection and Adobe PageMill. LogoMotion lets you add 3-D effects to text, so you can use it to make jazzy logos for your pages. You can also create animations, such as spinning text.



PhotoGIF lets you optimize images, add transparency effects, and save them as GIFs.

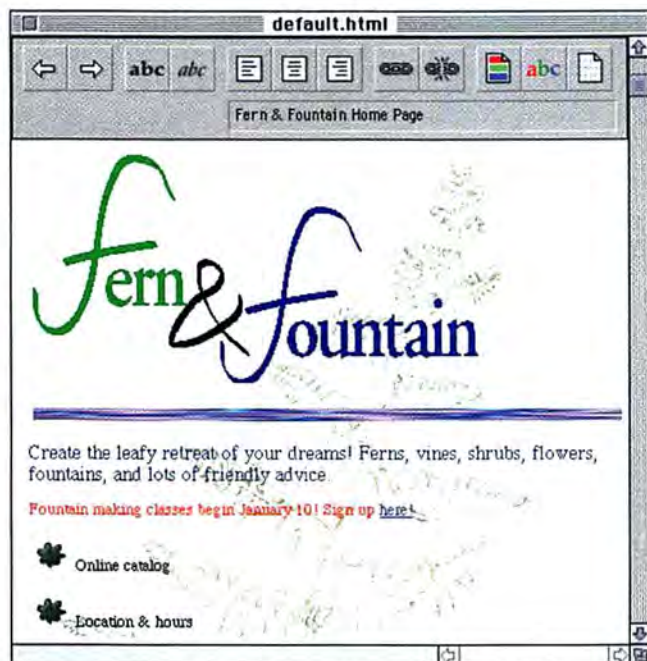
TextureScape lets you create professional-looking buttons and navigational icons with a minimum of sweat. You can infinitely modify the many suites of objects provided in WebHands or create your own. TextureScape can also generate background patterns for pages.

However, **3D Web Workshop** requires you to drag your graphics into PageMill in order to convert them to GIFs and gives you no control over the conversion. We found it better to copy images from 3D Web Workshop and convert them by using the free **clip2gif 0.7.2** (★★★★), developed by Yves Piguet (<http://iawww.epfl.ch/Staff/Yves.Piguet/clip2gif-home/>). Yes, clip2gif does what its name suggests: It converts the Clipboard's contents to a GIF. But it also converts among GIF, PICT, TIFF, and JPEG format and performs such common tasks as adding

transparency or interlacing and changing the bit depths of images. It can also operate in batch mode.

If you need to process a lot of Web images, however, consider using **DeBabelizer 1.6.5** (★★★★; \$399), from Equilibrium (415-332-4343; <http://www.equilibrium.com/>). DeBabelizer was created for designers working in the 8-bit world of on-screen graphics, and it can convert images to and from numerous formats. Although its interface is decidedly not for novices, DeBabelizer offers sophisticated, scripted batch modes that simplify large-scale conversions. Equilibrium also sells a "Lite" version of DeBabelizer 1.1 for \$129.

When preparing graphics for use on personal Web pages, you may find the **Interactive Graphics Renderer**, or **IGR** (<http://www.qualcomm.com/~phenness/webprojects.html>), just the ticket for getting quick and easy results. Created by Patrick J. Hennessey, IGR is a Web site that uses a form-based interface. From your browser, you can quickly generate a variety of 3-D objects (such as spheres and cubes) with different surface properties and light sources and then save them back to your hard disk for use on your site. Another Web-based source for creating graphics, Keith Ohlfs' **PixelSight** (<http://www.pixelsite.com/>), offers more options but takes longer to learn how to use, and you'll spend more time waiting for pages to load.



Presto! Personal Page has a simple interface, mostly because it has a limited feature set.

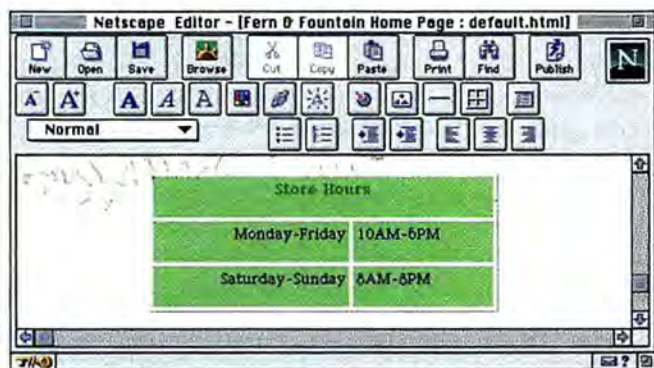
sets, but you can't actually see the pages that will be in the individual frames. Home Page doesn't let you change frame sizes by dragging, and golve Pro doesn't let you change them by entering numbers (PageMill, in contrast, supports both methods of changing frame sizes). golve Pro offers an elegant frame-formatting tool bar but has no options for setting a frame's margins. It does offer a convenient pop-up menu for setting targets for links.

In Home Page, you use the Object Editor palette to set frame attributes. To set up targets, you must know exactly what to type; the program doesn't help you remember frame names or syntax.

Styling Your Text

PageMill is the only program that offers a well-rounded set of keyboard shortcuts for most formatting options. Also, color aficionados should note that PageMill is the only program that maintains a customizable color palette; in the other programs, you have to select nonstandard colors via a color picker.

We were disappointed to find that none of the programs support style sheets or outlining, features that fit well into the structure of HTML. That problem aside, with the exception of Presto! Personal Page, all of them support a wide variety of character and paragraph formats. Presto! Personal Page supports only a few of the most-basic HTML-tag equivalents and does not have options for creating lists.



Netscape Navigator Gold's interface is dominated by a giant tool bar.

Typically, character- and paragraph-formatting commands are on menus and in tool bars, with most options in inconvenient hierarchical menus.

AOLpress' tool bar can be customized, so you could style text more quickly by adding more formatting buttons, although there are no controls for arranging tool-bar buttons in functional groups.

Beauty Contest

For interface design, golive Pro takes the blue ribbon — it's got flair and fashion sense. The color-coordinated program's tool-bar buttons are divided into meaningful groups, and the dialog boxes are sensibly proportioned. When you're not using the tool bar in golive Pro, you principally choose options from drop-down menus, which can be time-consuming.

Most people either love or hate PageMill's interface, which we found took some getting used to. PageMill takes drag-and-drop into the realm of the ridiculous, with a color palette whose items can't be applied simply by a click on them but must instead be dragged on top of a selection. PageMill's skinny palettes and tiny buttons are a boon to those using small monitors but can be difficult to see and require pinpoint cursor control to use. In addition, you need to read the manual in order to learn some of the trickier mouse-based shortcuts for selecting items and changing modes.

Home Page's interface has a comfortable, familiar feel. Most users will be able to use the program out of the box without encountering anything new or unexpected, although its tool bars have a few odd button groupings and we would like more keyboard shortcuts. Unless you have a large monitor, you may find its palettes annoyingly wide, because they tend to overlap document windows and dialog boxes.

Presto! Personal Page's simple interface is easy to use, although not innovative. The program has so few features that it gets along fine with a basic tool bar and drop-down menus. We'd like to see future versions support such editing niceties as the ability to select a word by double-clicking on it, although it's nice to see Presto! Personal Page offering multiple undo, a feature that is otherwise available only in AOLpress.

AOLpress' and Navigator Gold's interfaces have big problems. AOLpress' Save and Open dialog boxes may be unique in the Mac universe — and that's not a compliment. Navigator Gold doesn't support drag-and-drop within a document window and has an enormous, noncustomizable tool bar.

Picture This

In choosing among these programs, consider whether you plan to make images picture-perfect in a graphics application (see the "Graphic Relief" sidebar) or whether you'll be finishing graphics within an HTML editor. PageMill and Home Page provide tools for polishing graphics, such as adding interlacing and making transparencies. They can also estimate download times for individual graphics or for an entire page. PageMill has the advantage that it can display text wrapped around the sides of a graphic. Although both of the programs can scale graphics, only PageMill can maintain proportions while scaling an image numerically.

At the other end of the spectrum, golive Pro assumes you'll fine-tune images in a graphics program and helps only with HTML-related activities such as adding alternative text and changing border sizes, features also supported by all the programs except Presto! Personal Page.

Once an image looks right, you may wish to turn it into an image map — an image containing hypertext links to other pages. All the applications except Navigator Gold and Presto! Personal Page can help with this task. golive Pro shines at image-map creation, offering a full range of tools and making it especially easy to see the edges of regions and which URLs go with which regions. Home Page lags behind, generating only one type of image-map format and lacking a polygon tool for outlining irregular regions.

Multimedia Madness

With the exception of PageMill, the programs have no multimedia options, even though Web pages with embedded multimedia content are becoming common. Just like a browser, PageMill supports Netscape Navigator plug-ins directly as well as animated GIF images. We couldn't, however, get PageMill to work with sounds.

golive Pro displays iconic representations of plug-ins and has a useful dialog box for setting up plug-in attributes and quickly adding them to pages. Presto! Personal Page's single multimedia feature is the ability to play QuickTime movies.

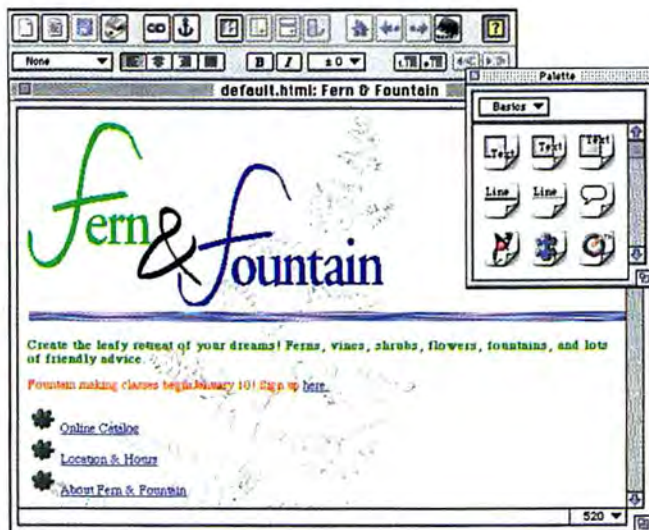
Navigator Gold is able to play many types of animations and plug-ins in its Browse view, but you have to add the HTML code for each of them yourself. AOLpress and Home Page don't support QuickTime movies or any other sorts of plug-in files and also force you to provide the HTML code yourself.

PageMill and golive Pro show Java icons in response to your setting up a Java-applet tag, Home Page shows a red box, and AOLpress simply displays a box with an X through it. Trailing the pack, Navigator Gold and Presto! Personal Page deal with Java applets only when you insert HTML tags manually.

Get It in Writing

If you want to learn HTML, routinely use newfangled tags that aren't supported by the programs we looked at, or plan to tweak tags in order to eke out extra control over your layouts, you'll want a program that lets you view the raw HTML tags behind your pages.





golive Pro lets you embed multimedia content in your pages by way of a floating tag palette.

AOLpress takes the lead here, displaying a tag view and a WYSIWYG view at the same time. When you switch to tag view, the cursor appears in a location analogous to its position in the WYSIWYG view. AOLpress also formats HTML text, coloring tags differently from text that will be visible in a browser.

PageMill can't display the tag and WYSIWYG views simultaneously

and it always relocates the cursor to the top of the tag view, but it's still the second-best at displaying raw HTML. It lets you insert and modify items in HTML view just as you would in WYSIWYG mode, and it updates the HTML tags accordingly. Home Page's text editor, in comparison, is mediocre at best.

golive Pro provides a different approach to tag editing. It cannot open the same document in HTML and WYSIWYG views simultaneously, but it sports an impressive outline-oriented tag view, where you work with tags within the context of their structure. The view makes it simple to understand how a tag works and to add tag attributes. golive Pro's HTML view also comes with an extensive, customizable database for storing tags and their attributes, and gonet plans to make database updates available as new HTML tags appear.

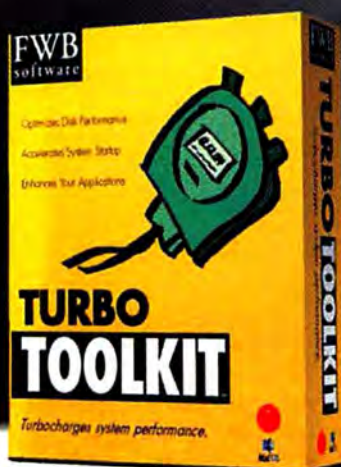
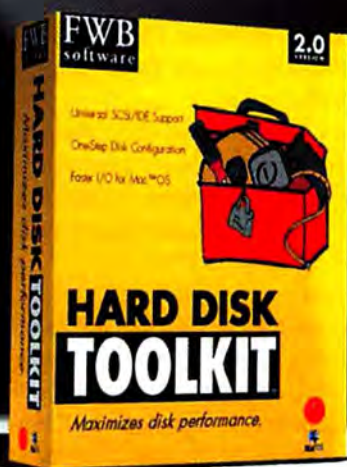
As far as other writing features go, none of the programs is on a par with the average word processor. AOLpress and PageMill offer spelling checkers. AOLpress and Presto! Personal Page let you replace text in multiple files at once, although Presto! Personal Page's replace functionality is limited. AOLpress, Home Page, and PageMill offer replace features that work in WYSIWYG and HTML text views. Navigator Gold has a find option, but no replace. None of the programs supports sophisticated find features such as pattern matching.

Serve 'em Up

Uploading completed pages to a server can be fraught with difficulties. Perhaps the most troublesome part is that the directory structure on your Mac must exactly match that on the server. This is no

FEATURES OF WEB-PAGE EDITORS

	✓ Adobe PageMill 2.0	AOLpress 1.2.2j	Claris Home Page 1.0	golive Pro 1.1	Netscape Navigator Gold 3.0	Presto! Personal Page
Forms	●	●	●	●		
Frames	●		●	●		
Tables	●	●	●	●*	●	
Display of background graphics	●	●		●	●	●
Display of lists	●	●	●	●	●	
Display of text wrapped around graphics	●	●				
Autosave		●	●		●	
Customizable default font		●		●	●	
Download-time estimate	●		●	●		●
Drag-and-drop graphics from Finder	●		●	●	●	●
Drag-and-drop graphics on page	●	●	●	●		●
Multifile replace		●				●
Multiple undo		●				●
Remote-site access		●	● [†]		●	
Graphic resizing	●	●	●		●	●
Addition of alternative text to graphics	●	●	●	●	●	
GIF interlacing	●		●			
GIF transparency	●		●			
Image maps	●	●	● [‡]	●		
Spelling checker	●	●				
✓ MacUser BEST BUY *Can't edit visually. †Hidden. ‡Server-side only.						



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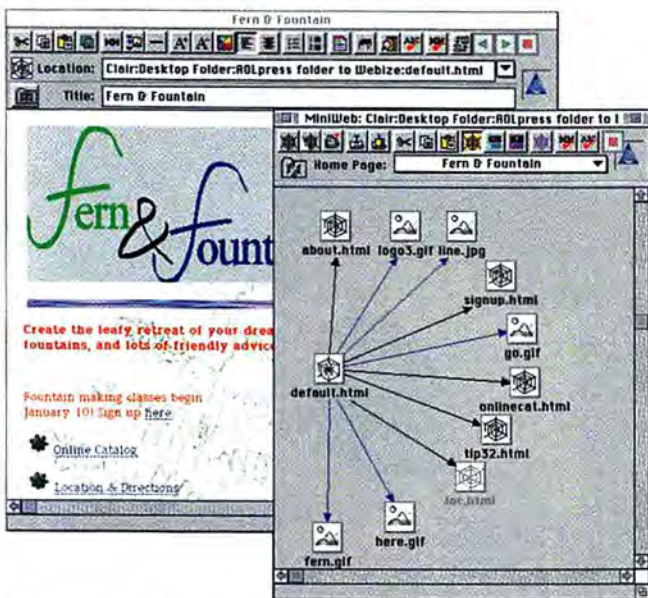


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CIRCLE 71 ON READER SERVICE CARD



AOLpress offers a visual site-management system that organizes various Web pages in a "miniweb."

problem if you place a site's components into a "root" folder before you incorporate them and if you don't then move them. Most people aren't that organized, though, so these Web authoring tools try to help.

For small sites, Presto! Personal Page does a great job with its Build Site command. When you're ready to upload a page or a site, you issue the Build Site command. The program responds by building a complete site in a new folder, which holds copies of all your files. AOLpress and golive Pro have special areas for organizing files. AOLpress' solution — a "miniweb" — permits you to view your site in a spiderweb view or in various directory-oriented views. Various colors and icons give information about the status of the files. golive Pro has a Project window, which works much like a tabbed dialog box and organizes sites by file type and provides some link-management options.

Most people don't serve Web pages from the same machine they use to create them. In fact, many authors use FTP to transfer their files to a remote machine, be it a Mac OS, Windows, or UNIX server.

Navigator Gold and AOLpress can both perform this task. Navigator Gold's interface is easy to use and worked well in our testing. Using AOLpress is more challenging, although it offers the nice touch of displaying FTP directories in the Save dialog box, much as if the server's files were on your local hard disk. With AOLpress, you must enter your remote user name and password as part of the FTP URL, and we had problems uploading to a remote Mac FTP server. AOLpress and Navigator Gold both also act as Web browsers, which makes editing a page that's already on the Web extremely easy. In addition, AOLpress offers a link checker that checks local links for a site.

Home Page has a feature for quickly opening and saving files via FTP too; however, we found it somewhat unreliable, which is probably why Claris decided to hide it. (Press Option while dropping down the File menu to see the hidden Remote option.)

Head of the Class

It's great to see how far WYSIWYG Web authoring has come in just a year. Those who haven't learned HTML are no longer constrained to creating simplistic pages that don't have much flair — this new

generation of tools lets Web designers spread their wings.

Adobe PageMill was the first success story in this category, and with version 2.0, it's still the best graphical HTML editor you can buy. Its table editor is robust, and its frame-editing capabilities are without parallel. And in a day when Java applets and Netscape plug-ins are becoming common, its support for embedding multimedia objects is vital.

For a version 1.0 product, Claris Home Page is a promising competitor to PageMill, although it's not ready to take the lead just yet. Its interface is what you would expect from Claris — intuitive and easy to use. (As we went to press, Claris announced that Home Page 2.0 will support multimedia plug-ins, fonts, and an improved HTML editor.) golive Pro, with its impressive interface, is another serious contender, but it's currently hamstrung by its lack of a graphical table editor.

Trailing the pack are Netscape Navigator Gold, AOLpress, and Presto! Personal Page. Navigator Gold doesn't support many common HTML features, despite Netscape's strength in the browser world. AOLpress offers a unique feature set and its price — free — can't be beat, but its interface and table editor are weak. Presto! Personal Page is a simple program lacking so many common features that it's simply outclassed by all its competitors.

Given how quickly the Internet world is moving, in another year, any of these products — or one we've never heard of — may reach the top of the heap. But for now, we recommend PageMill 2.0 for those who want to design professional-quality Web sites without having to learn the ins and outs of HTML. □

Tonya Engst edits TidBITS, an online weekly Mac newsletter, and wrote the HTML chapter for *Internet Starter Kit for Macintosh, Fourth Edition*. Her home on the Web is at <http://www.tidbits.com/tonya/>.

DIRECTORY

Adobe PageMill 2.0, \$149

Adobe Systems

San Jose, CA

800-411-8657

408-536-6000

<http://www.adobe.com/>

[prodindex/pagemill/main.html](http://prodindex.pagemill/main.html)

AOLpress 1.2.2j, free

America Online/PrimeHost

Vienna, VA

800-879-6882

703-448-8700

<http://www.primehost.com/>

download/index.htm

Claris Home Page 1.0, \$99;

competitive crossgrade, \$20

Claris

Santa Clara, CA

800-320-2099

408-727-8227

<http://www.claris.com/>

golive Pro 1.1, \$99

gonet communication

Menlo Park, CA

415-463-1580

<http://www.golive.com/>

Netscape Navigator Gold 3.0, \$69;

free for educational and

nonprofit users

Netscape Communications

Mountain View, CA

415-937-2555

<http://home.netscape.com/>

comprod/products/navigator/

gold/index.html

Presto! Personal Page (Tapestry

2.0), \$79; educational price, \$49

NewSoft

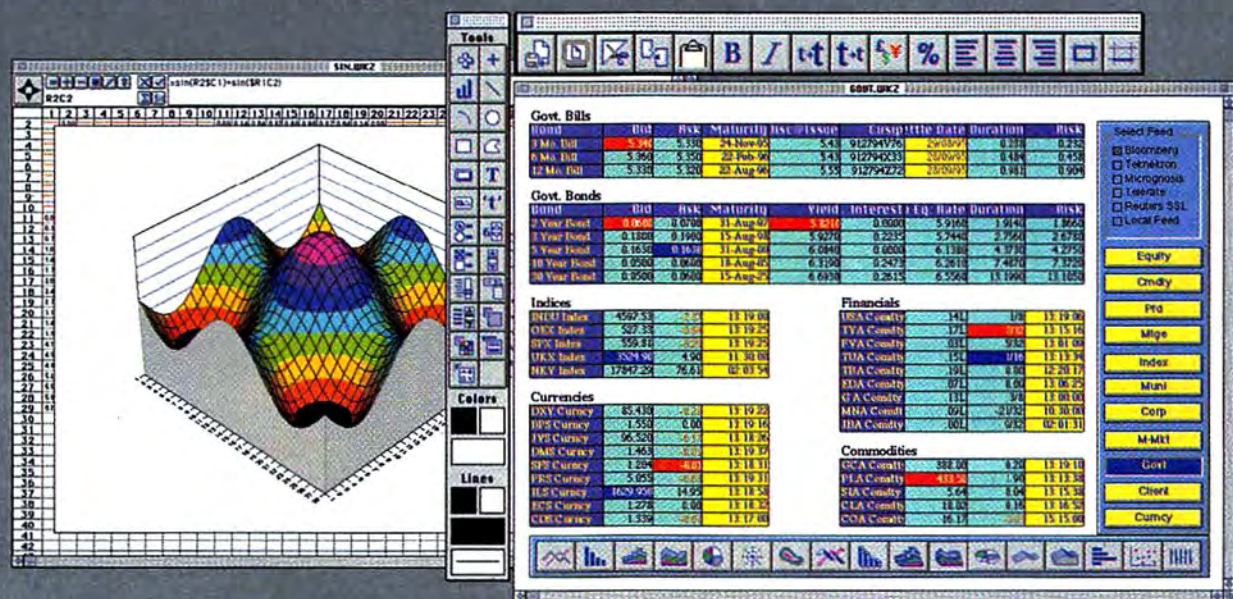
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CIRCLE 128 ON READER SERVICE CARD

High-Capacity Hard Drives:



SOONER OR LATER, you're going to need more hard-disk space. If you're a digital-video or multimedia producer, large MPEG and motion-JPEG files are probably residing in a mansion-sized home on your current hard drive. Graphic artists and prepress and desktop-publishing professionals deal with large files constantly, and using a hard drive sure beats archiving data on and retrieving it from an excruciatingly slow and unreliable tape setup. Even though surfing the Internet won't leave sand in your swimsuit, you can end up with megabytes of downloaded software. All of this means most of us are rapidly outgrowing our 1-GB hard drives. We need 4 GB of storage, maybe even more.

But buying a high-capacity drive isn't as simple as picking the most inexpensive product you can find. To help you make the right choice, MacUser Labs tested nine external drives. We looked at speed and case design and found that before you can pick a drive, you must determine your needs. Some drives handle large files faster than other drives, and the cases vary in quality.

The Hard Facts

There are several characteristics to consider when you're buying a new hard drive. The first one is obvious: capacity. If your only goal is to get as much space as you can get for little cash, you have to consider the price per

megabyte. The three drives we rated as Best Buys have prices per megabyte of \$.25 or less. At \$.23 per megabyte, the Apple 4300 Atlas (distributed by La Cie) and the La Cie 4.3GB Tsunami are the least expensive.

Then there's the case of the case. The case should be functional, sturdy, and appropriate for your use. A hard-drive case doesn't have to make a fashion statement, but you want a design pleasing to the eye. The APS case is rugged, stackable, and compact. We found the case of the CMS Enhancements DS4 and DS9 drives to be the bulkiest, and the drives emitted hot air through the front. The Liberty 70 Series 4.2-GB drive is the smallest of the nine, and although it is not the lightest, it is the only one that can be considered transportable (but not truly portable). This transportability comes at a price, however: The Liberty drive costs a whopping \$1,700.

You also need to consider the SCSI implementation of the hard drive. Three of the drives we tested — the CMS drives and the Microtech Blue Storm LC 9100 — are Fast SCSI-2 drives. Theoretically, the maximum throughput of an 8-bit Fast SCSI-2 bus is 10 MB per second, double the standard 5 MB per second. The Fast SCSI-2 drives we tested showed no speed gain, however, because

our test platform, an Apple Power Mac 7500/100, had a standard external SCSI-1 connector. If you want to take full advantage of an external Fast SCSI-2 drive, you'll need to install a SCSI-2 interface card and use SCSI-2-compliant cables. You can install an *internal* Fast SCSI-2 drive inside your Mac and gain the extra speed, but your Mac has to be one of the models that has an internal SCSI-2 bus (check your Mac's documentation).

Cabling and termination are also important. Most drives ship with a 25-pin-to-50-pin SCSI cable, which is fine if the drive is the first or the only SCSI device connected to your Mac. If you're daisy-chaining multiple SCSI devices, be sure to get the cable you need, whether it's a 25-pin-to-50-pin, a 50-



PHOTOGRAPHY / PAULINA ECCLES



FEATURES OF HIGH-CAPACITY HARD DRIVES

RATING	PRODUCT	ESTIMATED STREET PRICE	FAST SCSI-2	ACTIVE TERMINATION	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/MANUALS	SUPPORT
★★★★	✓ APS Q 4.0	\$1,000	no	yes	\$.25	5 years	+	●	+
★★★★	✓ Apple 4300 Atlas	\$920	no	no	\$.23	5 years	●	●	+
★★★★	APS MS 4.0 AV	\$1,100	no	yes	\$.28	5 years	+	●	+
★★★★	✓ La Cie 4.3GB Tsunami	\$920	no	yes	\$.23	5 years	●	●	+
★★★★	Microtech Blue Storm LC 9100	\$2,600	yes	no	\$.30	5 years	+	●	+
★★★★	CMS Enhancements DS4	\$1,400	yes	no	\$.33	5 years	●	—	+
★★★★	CMS Enhancements DS9	\$2,500	yes	no	\$.30	5 years	●	—	+
★★★★	Liberty 70 Series 4.2-GB	\$1,700	no	no	\$.40	1 year	+	●	—
★★★★	Optima Diskovery 4100	\$1,300	no	no	\$.32	2 years	+	●	●

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The Gig Is Up



pin-to-50-pin, or a 25-pin-to-25-pin cable. The drives from La Cie and Liberty have 25-pin connectors (Liberty sells a SCSI adapter for \$15), and the rest of the drives have 50-pin connectors. In addition, don't add a drive to your SCSI chain until you know whether it's internally or externally terminated, or you'll be confused when you attempt to get the drive up and running. Find out, too, if the drive has active termination, which helps reduce interference and resistance on the SCSI chain. The APS and the La Cie drives do have active termination.

Test Drive

To test the speed of each hard drive, we used MacBench 3.0 benchmark software, developed by Ziff-Davis Benchmark Operation. We used two test suites from MacBench: Disk Mix, designed to replicate tasks performed in the market-leading Mac applications, and Publishing Disk Mix, a battery of tests that involve the demands of desktop-publishing applications such as Adobe Photoshop and QuarkXPress. MacBench scores are relative to those of a Power Mac 6100/60 with a 250-MB Quantum internal drive, which has a score of 10.

We discovered that the speed of a drive

depended directly on its drive mechanism, the part of the drive that comprises several components, including the disk platters, the read/write heads, and the controller. Those drives that incorporate Quantum Atlas mechanisms — the APS Q 4.0 and the Apple 4300 Atlas — attained the highest average scores in our tests. The Liberty drive, with its Seagate Barracuda mechanism, ranked fourth in both the Disk Mix and the Publishing Disk Mix tests. The speed of the Optima Diskcovery 4100 was disappointing, in that it was slower than one drive that cost \$300 less and two that were \$380 less. Drives containing Micropolis mechanisms — the APS MS 4.0 AV, the Microtech Blue Storm LC 9100, and both CMS Enhancements drives — took a backseat to the rest in the Disk Mix test. Three of these drives (except for the APS one) would benefit from Fast SCSI-2.

We also evaluated the software utilities bundled with each hard drive. For the most part, the hard drives come with capable utilities. The Liberty drive, for instance, comes with the versatile FWB HDT Primer PE formatting utility. The software bundled with the La Cie and Apple drives came with a warning that left us uneasy: The Silverlining formatting software should be run from a floppy disk, lest users encounter errors in formatting and partitioning. Nevertheless, we did not experience anything that would indicate that Silverlining wasn't up to the job of managing these large drives.

smart shopper

5 questions to ask when you're buying a high-capacity drive:

1. What is the drive's price per megabyte?
2. How sturdy is the case, and can the drive be placed on its side?
3. Is the drive's termination switchable?
4. What type of cable is bundled with the drive, and what type of SCSI connector does the drive have?
5. Do you need to buy an interface card to enable your Mac to take advantage of Fast SCSI-2?

The Bottom Line

For overall value and peak performance, the APS Q 4.0 is our surefire winner. Digital-video producers might consider upgrading their systems to support a Fast SCSI-2 drive such as the Microtech Blue Storm LC 9100. For those who are looking to save a few bucks without compromising on quality, we highly recommend the Apple 4300 Atlas and the La Cie 4.3GB Tsunami. / MARK BAARD

Mark Baard is a freelance Mac consultant. Associate Project Leader Martin Wong managed the testing for this report.

DIRECTORY

Apple Computer (La Cie)
Beaverton, OR
800-999-1179
503-520-9000
<http://www.lacie.com/>

Liberty Systems
Santa Clara, CA
408-983-1127
<http://www.libertyinc.com/>

APS Technologies
Kansas City, MO
800-235-8935
816-920-4109
<http://www.apstech.com/>

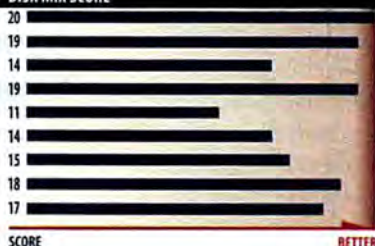
Microtech International
East Haven, CT
800-220-9489
203-468-6223
<http://www.microtechint.com/>

CMS Enhancements
Anaheim, CA
800-327-5773
714-517-0915
<http://www.cmsenh.com/>

Optima Technology
Irvine, CA
800-411-4237
714-476-0515
<http://www.optimatech.com/>

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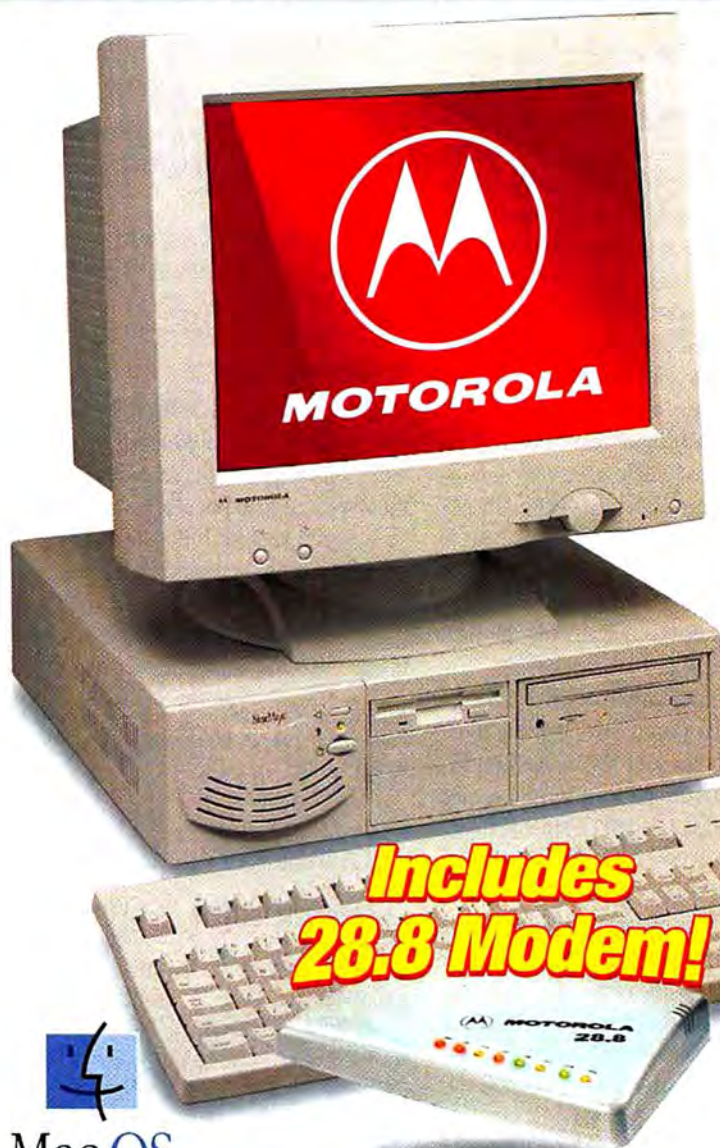


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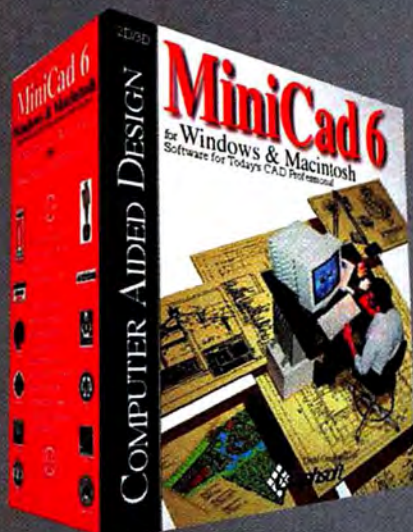
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By Brad Walrod

Xcellent XTensions

I F YOU WORK ALL DAY with QuarkXPress, chances are you know that any XTension that automates a laborious or otherwise impossible task is worth its weight in gold. The right XTension can simplify an everyday QuarkXPress chore to one mouse click or make a job you thought too difficult a breeze. In other words, even XTensions that cost hundreds of dollars can make you money and save you time.

That XTension you've wished for may exist but just may not be that easy to find. To date, more than 350 XTensions are available for you to sort through, and new ones pop up all the time. You can find some through mail-order clearinghouses and others only on online bulletin boards such as AOL's and CompuServe's Quark user groups (see the "3 Steps to Finding the XTensions You Want" sidebar). Part of the problem is that XTension developers range from companies as large as Extensis to one-dad operations such as College Fund Software.

To make sure you haven't missed anything that might make the difference for you, we pored through the past year's XTensions, new and updated. From XTensions for the masses to XTensions for the niches, here's a roundup of ten of the best and the brightest of 1996.

XTensions for the Masses

General-purpose XTensions can make you more efficient in subtle ways — for instance, by making a task that took five mouse clicks take only one. Because of that, their value is sometimes hard to measure. Before you invest your money and hard-disk space, think about your work habits and decide if an XTension can save you 30 minutes or more per week or per job. Then compare the XTension's price with how much you'd bill for that time.

These days, you can locate a lot of good everyday XTensions in bundles. Usually bundles have clunkers along with the jewels, but they're so cheap they're worth it. Leave the XTensions you don't like off your hard disk.

QX-FineTune. A useful XTension for those who do a lot of text tweaking, the QX-FineTune palette (see figure 1) allows you to adjust paragraph, character, item, and rule attributes without having to dig through dialog boxes. Part of the new QX-Tools package, from Extensis, this XTension gives you immediate access to everything from indents, spacing, and drop caps to box skew, background shade, and gutter width. QX-FineTune also fixes an annoying limitation of QuarkXPress by letting you offset rules by using negative values

beyond one-half of each rule's width.

One of five new additions in QX-Tools 2.0, QX-FineTune has unparalleled features that make this XTension worth the bundle's price of admission. QX-Tools also packs another favorite, QX-FindChange, a great tool that lets you search for and manipulate item and content attributes.

XPert View. This XTension, from ALAP (a lowly apprentice production), gives you quick and easy ways to arrange multiple documents on your screen, sparing you the tedious task of resizing and lining up windows by hand. XPert View is a great boon to anyone who needs to cut and paste between documents or to compare old ones with new ones. The XTension lets you view your windows in many ways (see figure 2), which, depending on the task, may be more useful than you think. You can even set all documents to Thumbnail view.

Part of the XPert Tools, Volume 1, bundle (there are two volumes), this well-executed XTension also remembers what page you were on (and even how zoomed-in you were) when you last edited your document.

ColorChange. If you work with color, you should own this tool. ColorChange, from

Vision's Edge, lets you interactively search for and replace colors, even by percentage — something similar XTensions just can't do. Basically, it's a find-and-change for colors (see figure 3) that lets you find all or selected colors used in frames, text, backgrounds, and pictures as well as search for and replace specific percentages. With the handy No Hidden check box, you can also skip over white backgrounds and zero-width black frames.

ColorChange is available as an individual XTension, but it's a lot more cost-effective to buy it as part of the Xdream bundle. Xdream differs from XPert Tools and QX-Tools in that it's one XTension with lots of utilities built in instead of a collection of XTensions. This is good news if you don't want to decide among lots of loose XTensions but bad if you're trying to keep your Utilities menu shorter than your arm.

Doc Magnify XT. Other XTensions allow you to break QuarkXPress' zoom barrier, 400-percent magnification, but few as unobtrusively and none as cheaply as College Fund Software's Doc Magnify XT. This "cheapware" XTension will cost you five bucks if you decide you like it, and it is available only from the developer, LaMonte Forthun. If you frequently want to zoom in close (say, to about 1,200 percent), to make rules butt together perfectly or to center something just right, take advantage of this one-trick shareware utility (see figure 4).

Batch Collect. If you often send jobs consisting of multiple files to a service bureau or client, you'll recognize Meadows Information Systems' Batch Collect as the time-saver it is. One dialog box lets you collect a whole group of files for output — even the 5 or 15 QuarkXPress documents (with graphics galore) you used for making that book or annual report. The XTension picks up only the pieces you specify or simply generates a report.

One of the best things about Batch Collect

is that unlike the alternatives that perform a similar function, it lets you create a *single* report for a whole project instead of making one for each file, as QuarkXPress' own Collect for Output option does. And it can combine the list of fonts and artwork in the order you choose. With its next release, Batch Collect will let you collect fonts as well.

XTensions for the Niches

Specialized XTensions can make the difference between a job accepted and a job rejected. What would you do if you had a chance to bid on a project that required a difficult and time-consuming task, such as producing running heads that changed frequently? Your first reaction might be, "Let someone else have that," knowing that all the extra work would make the chance for profits slim. But this is the moment at which using a specialized XTension can save the day. The right XTension can automate or ease even the most unusual task and allow you to take those jobs you otherwise wouldn't get near. In most cases, a specialty XTension should pay for itself many times over.

Headers & Footers. Have you ever thought about who made those running headers and footers in your dictionary that change on each page? If you've tried to do it yourself *without* this XTension, you may have wondered which insane asylum they ended up in. Headers & Footers, from ESS, spares you the tedium of entering new headers and footers over and over — as you often would for dictionaries or cookbooks — by automating the process. It extracts headers or footers from tags you key into your word-processing files or apply directly in QuarkXPress. Even better, the XTension can convert those headers and footers into uppercase, lowercase, or small caps (see figure 5). Headers & Footers is the only XTension of its kind priced for the masses and easy to use. As with all the XTensions in

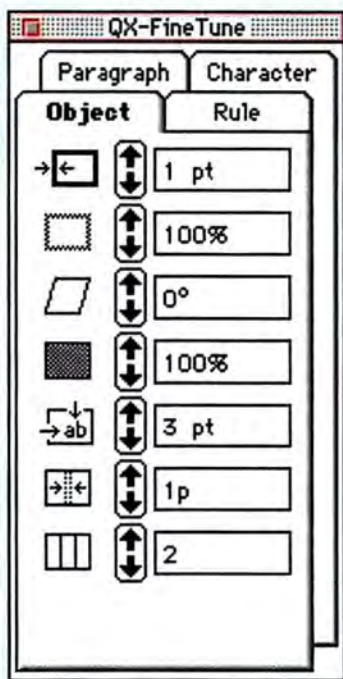


figure 1 / The QX-FineTune palette makes text tweaking easy by gathering together commands you'd usually have to dig through dialog boxes to use. It's one of five features that are new in the QX-Tools 2.0 bundle.

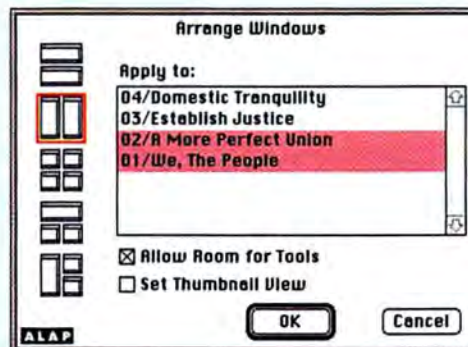


figure 2 / XPert View offers a handful of helpful ways to tile selected documents on your screen. This can be especially helpful when you cut and paste between documents.



figure 3 / ColorChange finds and changes colors, even by shade. If you use color, you should own this tool.

3 Steps to Finding the XTensions You Want

1. For immediate gratification, look Web-ward. If you want your XTensions *now* or if you'd just like to try one you've read about here, check out AOL and CompuServe, which stockpile loads of free and demo XTensions. You can find AOL's by typing the keyword *Quark* and looking in the Quark Libraries. You can find CompuServe's in the Quark Online Users Forum (GO QUARK). Users forums are good places to find XTensions available nowhere else. Also check Quark's Web site at <http://www.quark.com/>.
2. Try one-stop shopping through XTension

distributors. These easy-to-reach clearinghouses are good places to look first if you want to buy several XTensions, as they gather XTensions from developers worldwide. You can browse through the catalogs of both the World-Wide Power Company and XChange on the Web or call them for good-old-fashioned hard copy.

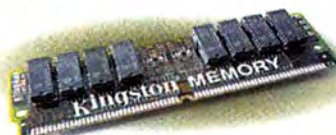
3. If all else fails, go straight to the source. If you can't find what you want, you may have to go to the developer. We've listed contact information for all the products we collected here (see "Directory").



IF YOUR MEMORY FAILS WHO CARES WHAT'S ON YOUR POWERBOOK?



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CIRCLE 80 ON READER SERVICE CARD

this section, if you need it, you just can't live without it.

fXT. Another book-creation task that can be tricky is fitting footnotes on the correct page, so it's nice to know there's a great tool that can do it for you. Like Headers & Footers, KyTek's *fXT* relies on tags you insert into either the original manuscript or your QuarkXPress file. The XTension automatically places the footnotes at the bottom of appropriate pages, following your instructions.

BlackLining QXP. If you lay out legal or financial material, you know that somehow you must indicate everything that changed since the last time you revised the file. BlackLining QXP, from Electronic Memory Services, goes a bit further — it lets you show all changes from the last 15 revisions. This XTension places color underlines below any inserted text and flags what you've deleted, by placing carets at the baseline (see figure 6). Different revisions can have different color underlines and carets, but they all print solid black. For those who need an XTension that can do this type of stuff, there's no competition.

Dashes DA. We're going to slip this one in even though it's not technically an XTension, since the straight XTension solutions to the problem of good foreign-language hyphenation have mysteriously disappeared from the market recently. Circle Noetic Services' Dashes DA overrides QuarkXPress' automatic hyphenation (which most often mangles foreign

languages) with its own, tailored for more than 30 languages, including Croatian, Finnish, Icelandic, Swahili, all the European languages, Hebrew, and Russian. Dashes DA ensures that you get the best international hyphenation at a reasonable price, but it is not as seamless as the other XTensions gathered here. You must apply Dashes DA to *unstyled* text, either in a word processor or in QuarkXPress. Even if you work in English only, Dashes DA is worth checking out if you don't like QuarkXPress' hyphenation decisions.

Gluon TextWaves. Geared for designers looking for new and different text effects, Gluon TextWaves lets you run text along one of five wave patterns. If you use multiple lines, you can produce cool geometric and fluid type effects (see figure 7).

Gluon TextWaves is one of several exciting new XTensions from Hologramophone Research grouped under the rubric Gluon. (That's the name of the subatomic particle that binds quarks together. Cute, huh?) Most of the company's new XTensions focus firmly on designers; the others are intended to help with high-end production at printers and service bureaus. Also keep an eye out for Gluon BoxWaves, which lets you apply similar kinds of sine waves to the left, right, or both sides of text and picture boxes.

Brad Walrod (brad@cis.compuserve.com) is a New York City-based typesetter/consultant and the author of the upcoming book QuarkXPress Studio Secrets.

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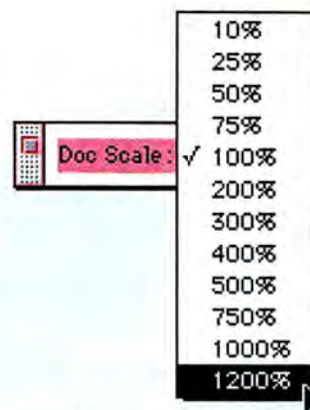


figure 4 / With Doc Magnify XT, you can break QuarkXPress' zoom barrier, 400-percent magnification, in order to take a really close look at your document.

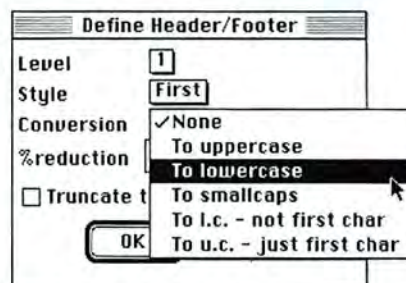


figure 5 / The Headers & Footers XTension takes the drudgery out of creating running heads and feet by extracting tagged text from your document and converting it to the style you want.

KEY FINDINGS

■ On average, 31 percent of budgets is allocated for ads

figure 6 / BlackLining QXP indicates any text you've inserted, with color underlines. Your deletions are flagged with colored carets along the baseline.



figure 7 / The wavy lines of text in this advertisement (created by Elyse Chapman) were a snap to make with the Gluon TextWaves XTension.

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108 MacUser / JANUARY 1997

1. SCAN SMALL OBJECTS IN GROUPS.



2. SCAN LARGE OBJECTS IN SECTIONS.



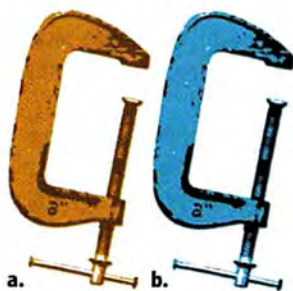
3. REMOVE THE OBJECT'S BACKGROUND.



4. POSTERIZE THE OBJECT.



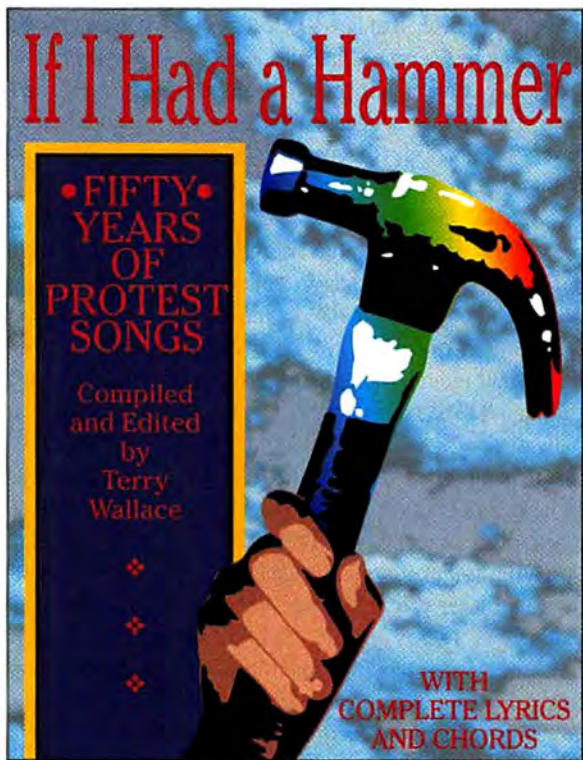
5. CREATE COLOR VARIATIONS.



6. CONVERT TO POSTSCRIPT.



7. ADD GRADIENTS TO CREATE A BOOK COVER.



gray in our clamp down to three tones — white, 50-percent gray, and black.

5. CREATE COLOR VARIATIONS. To create a simple one-color illustration, simply print the grayscale posterization in colored ink, for example brown instead of black (see figure a). To turn your posterization into a two-color illustration, convert your image from grayscale to one of the color modes (such as CMYK Color) and apply Photoshop's colorize option. Click on the Colorize box in the Hue/Saturation dialog box (Image: Adjust: Hue/Saturation), and then adjust the Hue as you like. This process adds a bright color to gray areas and leaves the white and black unchanged (see figure b).

6. CONVERT TO POSTSCRIPT. Go a step further by using an autotracer, such as Streamline, to convert your posterization to PostScript art. PostScript files are quite small, and you can apply the special effects of drawing programs to them. Best of all, PostScript art gives you a smooth printed image no matter what resolution you choose. After we converted our clamp, we used Illustrator to add color.

7. ADD GRADIENTS TO CREATE A BOOK COVER. To create a colorful book cover, we began by scanning the hammer again, this time with a hand holding it. (Yes, you can put your own body on a scanner!) Then we posterized the image; autotraced it; and opened it in Illustrator, where we added a rainbow-colored gradient fill, a cloud background, and type.

PostScript: Round 3

With its next-generation PostScript, Adobe sends us once more into the breach.

THESE DAYS WE'RE SO USED TO having PostScript around that we may forget that like other technologies, it needs to evolve or die. That's where Adobe's recent announcement of PostScript Level 3 comes in.

In its press release, Adobe says PostScript Level 3 is "geared for the requirements of the new wired world." Does that mean your cable TV will receive PostScript broadcasts? No, but it's not quite clear what Level 3's features will be or what this version will really do for us.

What we do know is this: It's been more than 5 years since Adobe rolled out PostScript Level 2, and 5 years in the computer biz is like 50 in other industries. PostScript has been getting a little long in the tooth, and, more important from Adobe's perspective, other PDL (page-description language) vendors have been filching Adobe's customers and the advent of the WWW (Wild 'n' Wacky Web) has meant that industry attention has been focused on HTML, not on PostScript.

Be that as it may, it's unlikely that HTML (or anything else, including Hewlett-Packard's PCL, Apple's QuickDraw GX, and whatever Microsoft is promoting today) will displace PostScript as the controlling language used by high-end laser printers, imagesetters, and platesetters. There's just too much industry investment in the hardware and software infrastructure surrounding PostScript for it to go away anytime soon. On the other hand, we recall that similar arguments were made to explain why desktop publishing would never displace high-end electronic production. But in the office market, PostScript is often unused, which we think is the main thrust of the Level 3 announcement.

What's in Level 3? Sometime in late 1997, Adobe will release a new version of the *Red Book* — no, not the names of communists in the publishing industry but *the* definitive document for PostScript, detailing every feature of the language. If you're a printer manufacturer, the folks at Adobe will tell you about Level 3 now, but here's what they're telling the Rest of Us:

Level 3 will support Enhanced Image Technology, which Adobe says will speed up image processing, add support for 3-D images, add photolike grayscale, make gradients (vignettes) smoother (finally!), and include a few other tweaks. One of the things to be added is "image compositing," which we fervently hope means transparency, so those soft-edged masks the Big Systems can do will finally filter down into PostScript.

A big win for prepublishing shops is that Adobe will integrate parts of Acrobat's PDF into Level 3, giving "page independence" to PostScript — in other words, the PostScript code on page 6 of your file won't depend on something that's happened on page 2, as it does now. This is important in imposition and in Web publishing, among other areas. It will make life much easier for people who output pages with more than one page per sheet, we suspect. As part of these features (which Adobe has dubbed Advanced Page Processing), the resident font set gets expanded beyond the normal Times, Helvetica, and so on we're used to today to something like 120 fonts. This is a big deal for those in the office market but not for those of us in publishing, because the font we want probably isn't resident in printer ROM anyway.

Web-Ready?


One of the big sleepers may be that PostScript Level 3 RIPs will process HTML directly. Whether this means that page-layout apps will start outputting HTML instead of PostScript remains to be seen, but this feature should make printing Web pages a whole lot easier. But how Adobe plans to integrate support for a "standard" such as HTML that changes every two weeks is a mystery to us.

And speaking of HTML, to keep up with the Joneses (HP, Imation, and others, in this case),

Adobe will add Web-based printer management. Your printer will have its own Web page, from which you can change its settings, fiddle with fonts, and even queue print jobs. As part of this feature set (called Adobe NetWorks

System), Adobe says it's going to rationalize the printer drivers, issuing "universal" installers on CD-ROM. Let's hope it doesn't forget the Mac this time around.

The final new aspect of PostScript Level 3 is what Adobe calls PlanetReady Printing (now *there's* a modest product moniker). PlanetReady Printing provides better support to printer vendors for internationalized (a.k.a. non-English) versions of their products — that is, support for international fonts, tools to help OEMs localize their PostScript printers, and probably some driver modifications as well.

Adobe has a lot of technologies on its plate: Acrobat 3, Supra (its high-end printing architecture, announced early last year), PrintGear (a lower-cost print engine for the SOHO market), and now PostScript Level 3. Adobe has its work cut out for it. 



Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a graphic-arts consultant and a partner in Genex Media, a company specializing in new media and Web design.

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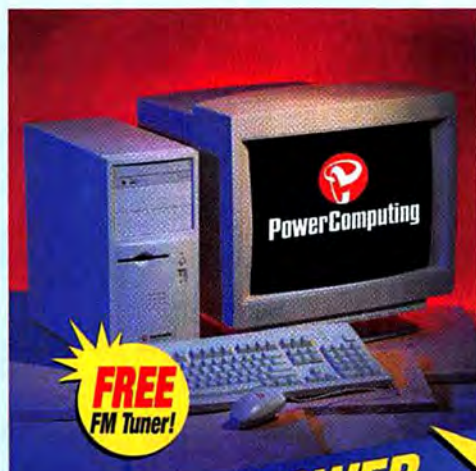
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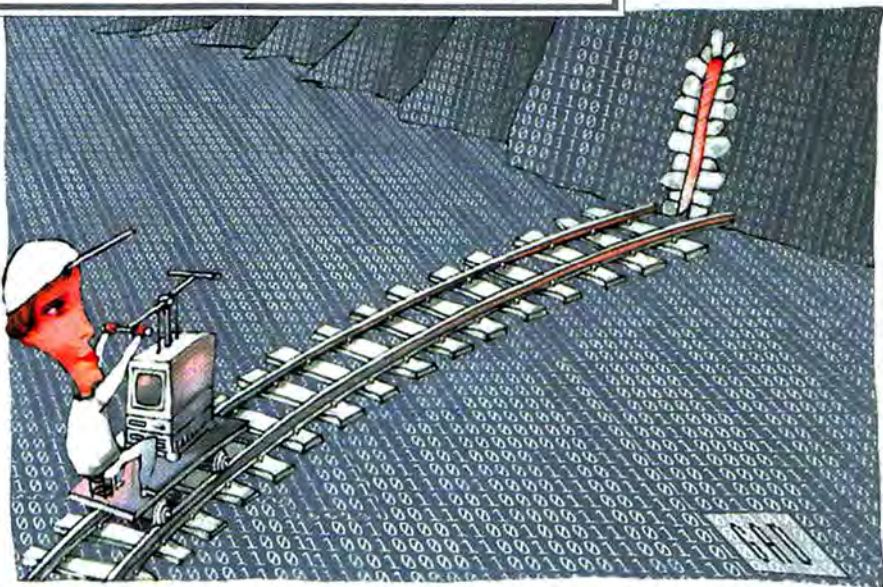


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NETWORKING

When your AppleShare server needs a speed boost, throwing hardware at the problem may not be the answer. Before you spend a dime, spend some time identifying the bottlenecks.



By Kelli Wiseth

Soup Up Your Server



IF YOUR APPLESHARE SERVER isn't as speedy as it used to be — if users complain that copying files takes forever or that the network seems sluggish — you may think the only solution is to get a faster Mac. But don't go shopping just yet. You can speed up your old workhorse and save a little money in the process.

What's the best way to speed up your server? There are probably as many answers to this question as there are networks and kinds of users. For example, users in a prepress house, who move very large files to and from the server, will have vastly different file-service needs from those of an administrative department in which users make updates to the same database file all day long. In the former case, network bandwidth and processor speed play a significant role in server performance; in the latter, network bandwidth may not matter as much as the amount of RAM the server has.

Whatever your situation, the first step to a speedier server is to find out where the bottlenecks are. With that done, you'll know enough about your situation to choose the optimal upgrade option. To help with this task, we called on the testing expertise of MacUser

Labs to evaluate several upgrade options, seeking the best and least expensive way to speed up a server.

Bottleneck Blues

It would be nice to solve server slowdown simply by throwing hardware at it. In some cases, that's just the thing to do, but before you write the check, it pays to understand a bit about bottlenecks.

Just as with a desktop Mac, the overall speed of an AppleShare server is dictated by the relationship among several factors; in the server's case, they include processor speed, amount of RAM, drive speed, network bandwidth, the number of users trying to get at the server, and what users do once they get there. In simple terms, if one of the server's components prevents any other component from performing at its peak — low network bandwidth prevents some users from getting to the server, for instance — that component is a bottleneck. Figuring out where the bottlenecks are is the key to configuring the hardware and software appropriately and the key to deciding where to spend your upgrade dollars.

LocalTalk provides a good case in point. A LocalTalk network always creates a bottleneck

for a PowerPC-based Workgroup Server, because LocalTalk's poky 230-kbps throughput doesn't deliver data fast enough to tax the powerful CPU. There's little point in spending money on a PowerPC-based server (or upgrading to one) if your network runs LocalTalk exclusively.

Tools of the Trade

OK — LocalTalk is a pretty basic and not too realistic example. In the real world, figuring out where the bottlenecks are is rarely cut-and-dried. You'll need to spend some quality time with your network and server, learning how, why, and when one or both slows down. Start by monitoring all aspects of the network and server during a week or two of normal use, to get an overall picture of server performance. Some of the tools you'll need to do this come with Apple's Workgroup Servers. Of the software included on Apple's AppleShare Server Solution CD-ROM, the AG Group's Skyline and Satellite network-monitoring software and Santorini Consulting and Design's Server Manager 3.2 are the two key tools that will help you start assessing your overall network, including server configuration.

You can install Satellite on a client machine



figure 1 / The AG Group's Skyline tool enables you to gauge whether your network is overutilized. If network traffic resembles that shown here, chances are that the problem lies with the server, not the network.

and use it to gather data on the entire network segment. You use Skyline to turn Satellite data into a graphical view of network traffic and utilization (see figure 1). Skyline displays network utilization as a percentage of available bandwidth. You can gather data over an extended period of time or at intervals you set, and you can use Satellite data to warn of bandwidth problems that slow users down or to eliminate the network as the culprit. If you discover that network utilization remains

each segment? How many users on each segment? Are users evenly divided among servers and segments? How are users interacting with servers? You can answer the last question by gathering data over a period of time on machines running Satellite, distributed strategically throughout the network. If you find that a segment of your network is overutilized, consider adjusting the load by rearranging network segments or by assigning users to a less busy server.

consistently under 25 percent, look to either the client Macs (are they underpowered?) or to the server for the source of the slowdown.

If Skyline indicates there are long periods of high utilization during a normal day, zoom in on the source of this traffic. You may be able to pinpoint a single Mac or group of Macs that use excessive network bandwidth. At this point, you'll need to look carefully at your whole network: How many network segments are there? How many servers on

Checking network utilization is a great way to begin a look into what's really going on with your server, but it's *only* a beginning. The server's own activity provides a bigger window to what's really going on. Santorini's Server Manager, also included on the AppleShare Server Solution CD-ROM, goes beyond the abilities of the AppleShare administration program, enabling you to configure alerts, administer users and groups, and perform a host of other activities. It is Server Manager's monitoring capabilities that come in handy for finding out whether your server is overutilized. You can monitor file and folder operations, such as deleting, opening, and renaming files and folders. Even Server Manager doesn't distinguish among CPU, NIC (network interface card), and hard-drive utilization and other statistics; it does, however, show server activity over time on a bar graph (see figure 2). (If you really want a low-level look inside the server, consider purchasing Santorini's \$195 Server Tracker, which can show you such things as file I/O calls and which client is making them.)

If Server Manager turns up a heavily loaded server and if network utilization seems to be within reasonable limits, it's time to consider upgrading the server. There are three sorts of

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components you may want to upgrade: NICs, RAM, and disk drives. A fourth, the CPU, is dependent on the availability of an upgrade card. At press time, Apple had announced but not shipped a CPU upgrade for its flagship Workgroup Server 8550.

To see how some of the upgrade alternatives fared, MacUser Labs tested an Apple Workgroup Server 8550/132 in several configurations. First, we tested the server as shipped from Apple — with 24 MB of RAM and a 2-GB internal Seagate hard drive. We used ZD Labs' new NetBench 5.0 Disk Mix test suite, which pelts the server with requests from 1 to 60 client nodes (in increasing increments of 4 clients), on the baseline machine and then ran the same tests after adding various configurations of NICs, RAM, and disk arrays. Our results were mixed and point out that upgrading an AppleShare server is far from an exact science (see the "Server-Upgrade Tests" figure).

Nickle and Diming It

If you've segmented your Ethernet network to limit competition among users for access to network resources, you've probably been frustrated that server access is still slow for some

(or all) users. Since everyone on the network must traverse the same network segment to get to the server, the benefits of splitting the network are lost.

The advent of Open Transport makes a solution possible: For the first time, AppleShare servers can accommodate multiple NICs, each of which is connected to a different network segment. On the Mac, this capability is called *multihoming*. Adding more NICs to the server won't directly speed up the server, but it will enable you to reduce the number of clients on any individual segment, thus reducing collisions on the network and providing better overall throughput. The use of multiple NICs has worked well in the NetWare environment for years, but support for the concept is new to AppleShare.

To see what benefit the Workgroup Server

might gain from multihoming, we installed four NICs (AsantéFAST 10/100 PCI cards) in the server. Since segmenting the network should reduce overall contention on any given segment, you might expect to see some improvement over using the baseline configuration. But the results for this test platform were disappointing. With a load of 36 clients

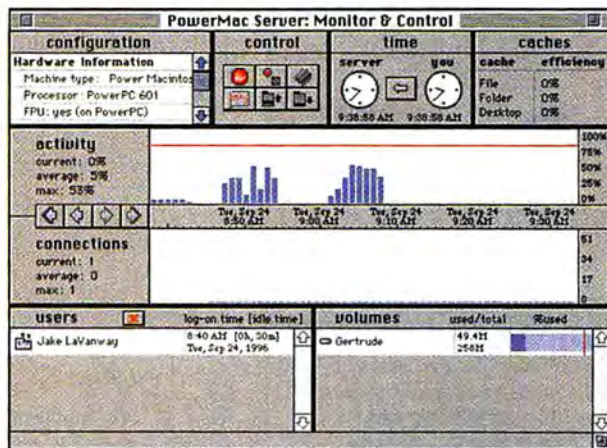
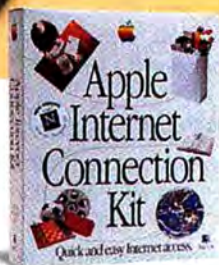


figure 2 / Santorini's Server Manager 3.2 includes the functions of the AppleShare administration program (managing users and groups, setting and clearing the AppleShare cache) but goes further. The Monitor & Control window's activity pane shows current server utilization, averaged over time, and the maximum activity during the period shown.

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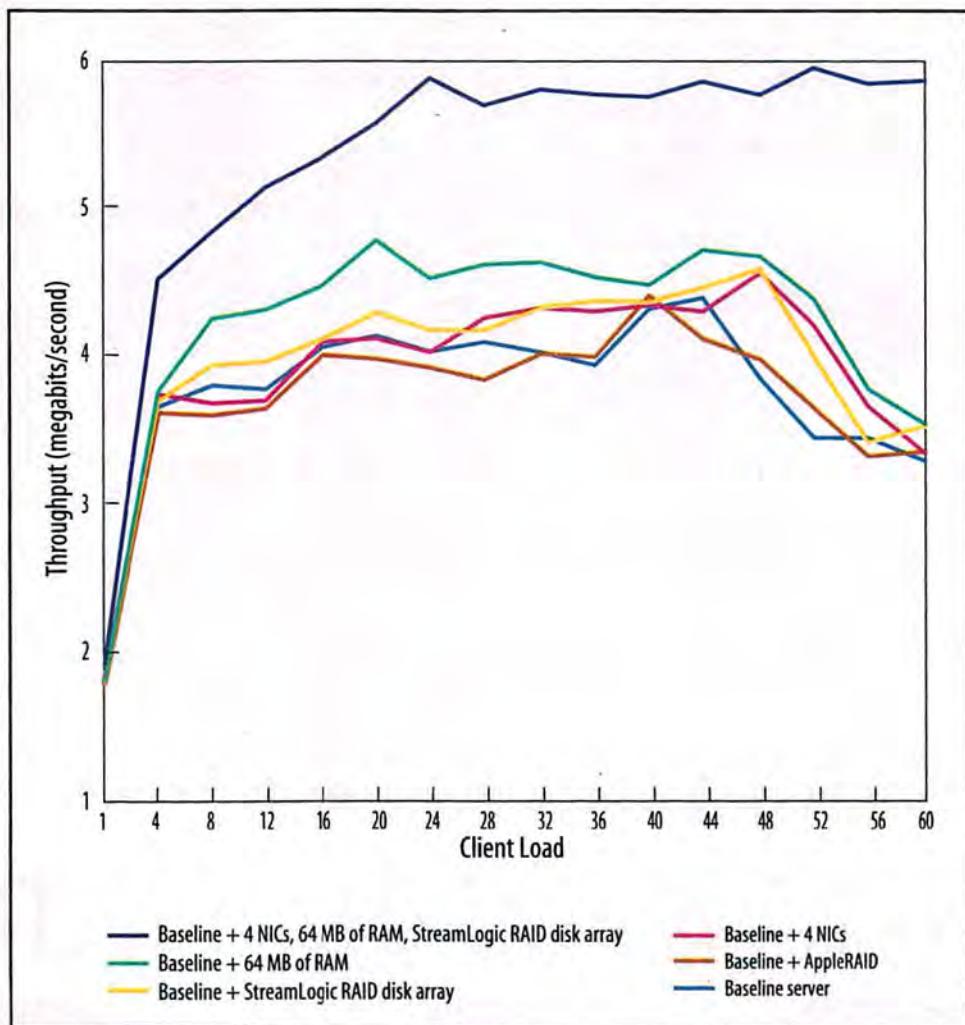


Server-Upgrade Tests / which server speedup is best?



WE USED THE ZIFF-DAVIS server benchmark test, NetBench 5.0, to evaluate several upgrade options on an Apple Workgroup Server 8550. The NetBench Disk Mix suite we used is based on performance profiles of five leading Mac applications (ClarisWorks, FileMaker Pro, Microsoft Excel, Microsoft Word, and WordPerfect) and the Finder, with Finder operations accounting for up to 50 percent of the test suite. NetBench steadily increases the server load from 1 to 60 clients in 4-client clusters. The test stresses the server by using multiple files, various file sizes, and various network file operations (open, copy, and so on) based on the profiled applications.

Each server configuration we tested successfully handled 40 clients, with some making it through the full 60-client load. Because NetBench tests are so intensive, it's likely that a baseline Apple Workgroup Server is capable of supporting more than 40 clients under more normal circumstances. Our results are best interpreted as general guidelines and as points of comparison for various hardware configurations. For example, the server configuration we used for our "kitchen sink" test, in which we added four NICs, extra RAM, and a high-speed RAID disk array, can probably support more users than an unenhanced server — but the exact number will depend on your situation.



(spread across four segments), throughput increased by only 9.5 percent over that of the baseline system; with the 40-client load, the improvement was less than 1 percent. That means that even with 60 clients, network collisions aren't a problem, but what's a greater disappointment is that the four-NIC multi-homing server configuration is incapable of successfully handling more than 48 clients. It appears that the overhead involved in switching among the four NICs in order to service requests is more than the server can handle.

RAMPing Up

Like using multiple NICs, adding RAM doesn't directly speed up the server, but it does enable the server to handle an increased workload — or more simultaneous requests for information. If all the application segments and data required to process one user's request can be loaded into the server's RAM

with room to spare for another user's request, both users will perceive that the server is doing its job well. If, however, there's not enough RAM to service the second user's request, both of the users may experience a delay in server response.

We replaced the RAM in our server with four 16-MB DIMMs, giving us a total of 64 MB. When DIMMs are installed in pairs, in the appropriate slots, memory is *interleaved* — the server can read from or write to multiple RAM locations at the same time, resulting in an overall increase in memory-access speed. We found that adding RAM had a very positive effect on server performance. The baseline and the upgraded server reached peak speed with a 44-client load, with the 64-MB server running our test suite nearly 8 percent faster than the baseline machine. Although both configurations began to slow down with 48 clients, the RAM-loaded system remained

faster than the baseline one at heavier loads, declining more slowly.

There's nothing sacred about the 64-MB configuration we used. More RAM will probably help if your server is called upon to transfer large amounts of data — copying files or opening large applications stored on the server. Adding RAM may also give the server a bit of a boost when it's dealing with large numbers of users. And there's one more point to consider: Dollar for dollar, upgrading RAM is a great bargain — at least for now. At press time, the 16-MB DIMMs we used were selling for about \$100 apiece on the street.

RAIDing the Cookie Jar

It probably goes without saying that the faster the server can get data off a disk, the faster that data will become available to users. Drive-based bottlenecks are not usually the primary cause of server slowdowns, but an

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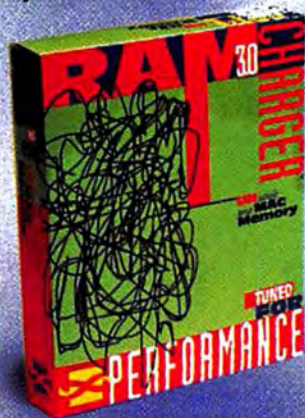
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underpowered storage system can contribute to sluggishness. Installing a RAID (redundant array of inexpensive disks) system — which combines multiple drives in order to provide one logical disk volume — can speed up drive I/O by splitting reads and writes across multiple physical surfaces at the same time. Apple ships RAID software with all its servers, and we decided to see if this “free” solution could buy us anything.

With the original 24 MB of RAM in the

server, we added a second 2-GB Seagate drive and configured the server for RAID 0, using Apple's AppleRAID software. Since the Workgroup Server 8550 has two SCSI buses — an external bus that operates at 5 MB per second and an internal one that supports Fast SCSI-2 (10 MB per second) — we configured AppleRAID for weighted SCSI 0, which writes more data through the faster of the two buses. The results were generally disappointing. At server loads of 32 and fewer clients, the throughput

was less than it was with the baseline system. Unless your main interest in RAID is the consolidation of several drives to give you one large volume, there's little benefit in using AppleRAID's RAID 0 configuration.

We decided to raise the stakes by testing a more powerful RAID setup, a StreamLogic SledgeHammer 8200 PCI Wide 8-GB disk array. The SledgeHammer consists of a PCI card and an external box containing two 4-GB drives, which communicate with the Fast SCSI-2 bus via the card. The Hammer drives offer better throughput than the Seagate drives we used with the AppleRAID software. Not surprisingly, the server with the SledgeHammer fared better than that with AppleRAID, delivering 19-percent-faster throughput than the baseline system for a 48-client load. Like adding RAM, using the SledgeHammer also kept the server going past the 44-client load, the point at which the baseline system's performance began to taper off. Unlike adding a few extra megabytes of RAM, buying a speedy RAID system will cost you a pretty penny: The SledgeHammer sells for \$3,799.

Working in the Kitchen

Mindful that our test results had been mixed, we decided to go for broke. Our final series of tests, affectionately dubbed “the kitchen sink” by our testing team, involved adding four NICs, 64 MB of RAM, and the StreamLogic RAID system. The kitchen-sink test platform fared far better than any other server configuration. Even with 60 clients, NetBench reported no dropped clients. With 36 clients, the kitchen-sink system was 48 percent faster than the baseline, and with 40 clients, it was 34 percent faster.

Stirring the Soup

Finding the bottlenecks and removing them one by one is key to improving file-server performance, but finding the bottlenecks is time-consuming. Before upgrading your server or the network itself, gather as much information as you can, using common sense and network-monitoring tools. Once that's done, you can add a pinch of this and that until the mix is just right.

Kelli Wiseth is a MacUser contributing editor. Associate Project Leader James Galbraith managed the testing for this report.

NetBench 5.0, the benchmark software used in testing for this report, is available online on ZD Net from Ziff-Davis Benchmark Operation, at <http://www.zdnet.com/zdbop/>.

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NET TRAVELER / By Michael Swaine

Surfing for Buried Mac Treasures

You've got to dig for the cool, the obscure, the totally Macintosh.

YOU UNLOCK THIS DOOR with the key of imagination. Whoa, where have you heard that before? Oh, right, at the beginning of every *Twilight Zone* episode. But if you searched for that memorable monologue on the Net, your search engine would grind through the chaff of a hundred home pages named for *The Twilight Zone* before it finally found The Sci-Fi Channel's *Twilight Zone* page at <http://www.scifi.com/twizone/>. There, you would be rewarded with episode summaries and the results of a Rod Serling sound-alike contest. In fact, there are countless buried treasures on the Internet, if you're willing to dig for them. But dig you must: The Internet's organizational structure bears less resemblance to a library than to a landfill.

This month I've saved you the trouble of getting dirt under your fingernails. I've dug up some of the more nifty and outré Mac goodies from the twilight zone of Net obscurity: the sites and software you can't see from the main road.

One Infinite Loop. You'll never discover the rich back alleys of the Mac universe if you start at the front door (<http://www.apple.com/>). Apple's Web presence is a maze — a neat and attractive maze, but still a maze — and you keep coming across disquietingly familiar twists and turns. Getting out is one problem. Apple isn't big on pointing outside to third-party sites. OK, there's <http://www2.apple.com/documents/vendors.html>, but you'd better know what you're looking for when you go there. Apple's own software is not always that easy to find. The Newton Internet Enabler, for example, is the hottest download for folks who pack a PDA, but it's nowhere to be found on Apple's main FTP site. You will find it deep in the recesses of the Mac-developer hierarchy, at <http://devworld.apple.com/dev/newton/tools/nie.html>.

And then there's all the inside Apple dope

you have to go outside for. Look for Easter eggs, product code names, and known software conflicts, for example, at <http://members.aol>

(<http://VTGinc.com/ebennett/xplat/>) for a comprehensive guide to working and playing with your PC-using chums.

Just for Fun. OK, you've downloaded all the control-strip modules and software updaters your hard disk can hold, and you're looking for some fun. You know about the plethora of screen-saver modules that populate "the usual places," but did you know that the producers of *Independence Day* have created a custom screen saver celebrating their little film? You'll find it available only at their Web site, <http://www.centropolis.com/>.

Marathon fans, there are a lot of sites devoted to your particular obsession, but the must-have goodies are waiting at <http://www.ese.ogi.edu/pub/entertainment/marathon/>. And for those who like to use

the Macintosh as a kind of high-tech noise-maker, there's the site devoted to obscure sound utilities, at <http://pubweb.nexor.co.uk/public/mac/archive/data/sound/soundutil/index.html>. That's where you'll find Parrot and a digital lava lamp: two clever hacks that listen in on ambient sounds and conversations in the room where your Macintosh lives and spit them back at random intervals or turn them into weird art. Crank up one of these bizarre programs and turn out the lights, and visitors to your computer room will think they've entered the twilight zone.

Don't Know CGI from GI Joe?

MacUser maintains a list of 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.macuser.com/>. You can reach me at traveler@macuser.com.



.com/ixist/apple.html, <http://www.bendigo.latrobe.edu.au/www/dssg/secret.names.html>, and <http://www.manual.com/conflicts/>, respectively.

More Software Sleuthing. Some individuals have taken great pains to document the countless updates, system-software enhancements, and utilities that make being a Mac user such a joy. And like so many things Macintosh, these hard-to-find home-brew sites are well worth your time.

To keep your applications as current as possible, check out The Updater Update (<http://web.absoluteweb.net/absoluteweb/mac/mdoc/mainmac.html>). And then there's Dave's Control Strip Guide (<http://www.phasedeux.com/members/dsytma/csm/index.html>), which points you toward 117 of the little devils. Last, if you're forced to acknowledge that there are platforms besides the Mac, head on over to The Cross-Platform Page

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HANDS on

Is a trip to the repair shop in your future? Let the wisdom of the ancients be your guide.



By Christopher Breen

Fix It Yourself

WERE THE EMINENTLY QUOTABLE Marcus Tullius Cicero living in these togaless times, he might have opined, "The shifts of fortune test the reliability of not only our friends but our computers and attached peripheral devices as well."

With the exception of the occasional exploding PowerBook and brain-damaged PowerPC Performa, Macs have long been considered among the most reliable computers on the market. Yet fortune, in the guise of power failures, frayed cables, blocked cooling vents, undersupervised children, and time can take its toll on even the most steadfast machinery.

How do we mere Bartlett's-quoting mortals know when fortune has dealt us a hand so corrupt that the cool, glassy door of our local Mac repair shop is the sole gateway to salvation? Well, reading this article isn't a bad place to start. Before you assume that your Mac has departed, consider these symptoms and strategies for bringing it back from the stony brink.

Startup Errors

Symptoms: Sad-Mac error or "chimes of doom."
Possible causes: Faulty or unseated RAM chips or accelerator cards. Bad cable. Corrupted disk driver.

Home remedies: The first and easiest fix is to zap your PRAM. Hold down Command-Option-P-R, and wait for your Mac to boot twice before releasing the keys.

The next remedy is to start up from Apple's Disk Tools floppy. If you're successful, you probably don't have a hardware problem. Use utilities such as Apple's Disk First Aid, Symantec's Norton Utilities, or Symantec's MacTools to attempt repair. If the disk can't be repaired with these utilities, try using disk-formatting software such as FWB's Hard Disk Toolkit to update the disk driver.

If floppy startup is unsuccessful, open the Mac and ensure that all RAM and peripheral cards are snugly in place. Still doesn't work? If you have an accelerator card, remove it and see if that solves the problem. You can also strip your SCSI chain down to just the startup drive. If you use an external drive for startup, check to see that it's properly terminated.

If the devil's music continues, leave enough RAM chips to allow the Mac to operate, and remove the rest. Swap RAM around to determine if one of the SIMMs or DIMMs is bad.

Symptoms: Floppy-disk icon with question mark at startup. Hard-disk icon doesn't appear on the desktop.

Possible causes: Corrupt System file. Bad SCSI connections. Outdated or corrupted disk driver.

Home remedies: Start up from Apple's Disk Tools floppy (or CD-ROM if your Mac model supports it) or an emergency floppy included with a repair utility. Try to locate and diagnose the disk with your repair utility. If you can access the disk but the utility fails to fix the problem after repeated attempts, perform a clean install of your system software. (See your Mac manuals for instructions on clean installs. Keep a copy of your old System Folder so you can retrieve fonts, third-party extensions and control panels, and preference files.)

Oh, you couldn't find the disk? Simplify your SCSI chain by removing all SCSI devices except your startup drive, and make sure the power and SCSI cables are firmly seated. Check the drive's activity light for signs of life.

Still no luck? Attach another drive, one containing viable system software, to your SCSI chain — an Iomega Zip or SyQuest EZ135 drive would be ideal in this situation, since their cartridges have just enough capacity to hold your System Folder and a few favorite troubleshooting utilities (see the "Mac First-Aid Kit" sidebar). Restart, and hold down

Mac First-Aid Kit / essential hardware and software

THESE TOOLS ARE INDISPENSABLE for every good Mac physician.

- **SCSIProbe.** The Mac can't find your SCSI-device media? Maybe Robert Polic's freeware SCSIProbe can. (Find it online; see end of article.)
- **The Disk Tools floppy.** Some Performa and PowerBook models come only with the disk image of the Apple Disk Tools floppy. The first thing you should do after calling your friends and gloating about your new Mac is to create a Disk Tools floppy and make sure it can start up your Mac.
- **Norton Utilities or MacTools.** Either of these

Symantec products can usually get you out of the soup when your Mac has taken a dive.

- **Conflict Catcher 3.** This Casady & Greene product is the most effective utility for troubleshooting extension conflicts.
- **Retrospect.** You need a reliable backup strategy, and Dantz' Retrospect will provide it.
- **TechTool Pro.** MicroMat's terrific utility can test just about every hardware system on your Mac.
- **A virus checker.** Disinfectant will do the trick, and it's free (see end of article). The commercial products, Symantec's SAM and DataWatch's Virex,

have extras such as automatic updates.

- **Up-to-date formatting software.** When you must reformat your disk, you need the latest drivers to ensure system-software compatibility. Apple includes its own formatting software on the Disk Tools floppy. Good third-party packages include CharisMac's Anubis, Casa Blanca's Drive 7, and FWB's Hard Disk ToolKit.

- **Iomega Zip or SyQuest EZ135 drive.** These drives are portable, and one cartridge (\$20 to \$30) has the capacity to hold your System Folder as well as numerous repair utilities.



Command-Option-Shift-Delete to boot the alternative drive. Try to track down the missing disk with disk-formatting software, and install a new disk driver.

Crashes

Symptoms: The watch cursor appears and never departs. Indecipherable messages appear on-screen letting you know that an error has occurred. Your Macintosh performs a remarkably convincing imitation of a light-emitting cardboard box.

Possible causes: Everything from extension conflicts to buggy software to cruddy hardware to the phase of the moon.

Home remedies: The most common cause of crashes is extension conflicts. The easiest way to tell whether your Mac is thus afflicted is to restart with the Shift key held down. If the Mac seems happy afterward, a conflict is probably the cause of the crash. Although you can track down conflicts by dragging groups of extensions and control panels in and out of their respective folders, Casady & Greene's Conflict Catcher 3 and Now Utilities' Startup Manager make the process considerably easier.

If crashes happen consistently when you're in a particular application, it could be due to a software bug in that app. Control panels and

extensions can still be a factor, however. For example, early versions of Connectix's RAM Doubler and Speed Doubler may conflict with several applications, as may the Apple Menu Options control panel. Disabling these items is always a good starting point.

If fiddling with extensions and control panels isn't having any effect, try the handful of general remedies for many Mac illnesses: Reformat your hard disk; install a clean version of the system software; check all your SCSI, ADB, and serial connections; and grouse to every tech-support representative you can get your hands on.

Crashes can be caused by a faulty Mac. If you have one in the 5200, 5300, 6200, or 6300 series, download a copy of Apple's tester utility, from <ftp://ftp.info.apple.com/> (the utility is called 5xxx-6xxx_Tester_1.0.sea.hqx). Running the tester will tell you if your Mac may be defective. If it tests positive, call Apple.

The demon behind your crashes, rather than being Apple hardware, could be Apple software. System 7.5.2 is a dog and should be replaced with 7.5.3 and its plethora of updates. Open Transport is also suspect. If Internet applications are giving you grief and you're using Open Transport, try switching to traditional AppleTalk if your Mac allows that.

General Weirdness

Symptoms: Dead mouse and keyboard. Skittish mouse.

Possible causes: Bad ADB cable. Gunked-up mouse.

Home remedies: For dead input devices, replace the ADB cable — only when the Mac is powered down. Remove the "mung" from dirty mice. Flotsam can be removed with a foam swab, denatured alcohol, and a judiciously applied thumbnail.

Symptoms: Generic icons. Trash icon won't expand. System clock is set to a date in the Eisenhower era.

Possible causes: Confused desktop directory. Frazzled PRAM. Dead battery.

Home remedies: Download a copy of MicroMat's freeware TechTool (see end of article), and rebuild the desktop with it, which is more thorough than doing a regular rebuild. If that doesn't help, try zapping the PRAM with TechTool.

If your problem is that the clock resets itself to a date decades old, you probably need a new battery.

You can always try checking the disk with Norton Utilities or MacTools, reformatting the disk, and saying 12 Hail Marys. Speaking of which...

Acts of God

When you're hosed, you're hosed. It's possible that none of our remedies will make your Macintosh act right or that you will experience problems that are out of the realm of home repair: smoke spouting from the CPU; a trail of ants leading to and from your beloved Apple product; peanut butter, Play-Doh, or some other sticky, attractive-to-kids substance oozing from the floppy slot or CD-ROM slot. How marvelous that our ancient Roman friend devised a quote for just this occasion: "It was ordained from the beginning of the world that certain signs should prefigure certain events."

Remedy: Drag your Mac to the shop, and tell the tech that Cicero sent you.

MacUser Contributing Editor Christopher Breen is bound and determined to write off the \$40 he pungled up for the 16th edition of Bartlett's Familiar Quotations.



You can find the shareware and freeware programs referenced in this article at MacUser's Software Central (<http://www.zdnet.com/macuser/software/>). You can also find them in the MacUser areas on CompuServe (GO ZMC:MACUSER) and America Online (keyword MACUSER).



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By Bob LeVitus and Christopher Breen

Help Folder

Spam in your mailbox, that empty icon feeling, and sound management.

Spam Ain't Just Meat

Q. I've been getting a lot of junk e-mail lately. I really hate this stuff! Is there anything I can do to stop getting it?

Christopher Bates
via AOL

CHRIS: Christopher, my sincerest hope is that by the time you read this, junk e-mail will be far less common than it is today — at least on AOL.



BOB: This stuff is called *spam* in the online world. The name comes from that old Monty Python skit in which the boys chant "Spam, spam, spam..." over and over again. You get the idea — it's any message that's posted all over the Net.

Spamming is a major no-no in the online community. Because you pay for your time online, it's a little like having a phone solicitor call you collect.

WRITE TO HELP FOLDER/TIPS

c/o MacUser
50 Beale Street, 12th Floor
San Francisco, CA 94105

Don't want to wait for an answer? Post your question on the MacUser Forum on either America Online or CompuServe, or send e-mail to helpfolder@macuser.com or tips@macuser.com. We pay \$25 to \$100 for any undocumented tips we publish.

CHRIS: Which is why we sincerely hope that America Online will persevere in its attempts to keep Internet junk mail from coming in through the AOL gateway. If you haven't been following the papers, here's the situation:

A few select companies — for this example, we'll call them Dirtbags — grabbed hold of AOL's member list and bombarded AOL members with unsolicited advertising.

Naturally the members complained, and AOL took action — the service blocked messages originating from known Dirtbag addresses. Lawyers in the employ of the Dirtbags filed suit to keep AOL from blocking the messages, and the bombardment continued. Even as we write this, AOL is preparing to go to court to resolve the situation. Hopefully, blocking will resume and we will have heard the last of the Dirtbags.

BOB: I doubt that will be the end of it. These Dirtbags, as you so colorfully label them, have no shame. They'll find a way to get their message out.

CHRIS: Maybe, but it's worth the effort to try to slow them down a bit. Fortunately, we have a few options for keeping our mailboxes free of this unwanted clutter (see also Andy Ihnatko's "Junk-Mail Jihad," in this issue):

If you're on a service such as AOL, forward copies of the spam to representatives of the service. On AOL, you can forward it to Postmaster, TOSEMail1, or TOSEMail2. If you're using an Internet provider, send a message to the folks in charge.

BOB: Check out the Blacklist of Internet Advertisers on the Web (<http://www-math.uni-paderborn.de/~axel/BL/>). Here you'll find a list of advertising spammers, and some handy tips for dealing with spam.

CHRIS: If you're spammed by people on AOL (meaning they have an AOL return address), send a copy of their message to Postmaster.

AOL has control over its own service and will deal with internal spamming.

BOB: Let the spammers know in no uncertain

Tips / AVI to QuickTime

Internet Explorer's a Drag

In the September '96 Help Folder (page 101), Chris suggested using Microsoft's Internet Explorer to view AVI files. Although Explorer does a fine job of displaying the movies, its Save As command does a less than perfect job of converting these files to QuickTime. I thought I was doomed to these poor translations until I discovered the magic of drag-and-drop:

Just open an AVI file in Internet Explorer and drag the movie box to the desktop. When you do so, the file is converted to a QuickTime movie clip. To complete the conversion, open the clip with MoviePlayer or SimplePlayer and save it as a self-contained movie.

Chad G. Bloom
via AOL

MacZilla

With Knowledge Engineering's MacZilla plug-in, you can view and convert AVI files in Netscape Navigator. But there's a trick to saving the file:

When you click on a link attached to an AVI file, MacZilla launches and starts to decode the file as you watch its progress. After the file has been completely downloaded, MacZilla plays it. To retrieve a QuickTime copy of the movie, you must open the MacZilla folder in the Preferences folder inside your System Folder. Inside the MacZilla folder, you'll find a QuickTime version of the movie. If you want to save this file, you must drag it out of the MacZilla folder ASAP. This folder is for cache files only, and any files remaining inside when the next AVI movie loads will be deleted.

A few shortcuts: Create an alias of the MacZilla folder on your desktop — it will make navigating to your movies much easier. Also, you'll find that you can retrieve the files more quickly if you set the MacZilla plug-in to save files to disk. To enable this setting, choose General Preferences from MacZilla's Options menu, click on the Helpers tab, select Microsoft Video from the list, and click on the Edit button. In the resulting dialog box, check Save to Disk and click on OK. MacZilla can then open and convert the AVI files you've saved to disk, in an off-line Navigator session.

You can locate MacZilla at <http://www.maczilla.com/>.

Mell Eadie
via the Internet

terms that you disapprove of their methods. If sending them a 1.5-MB TIFF image of the words *Spam Sucks!* helps drive home the point, so be it.

CHRIS: Boycott any product or service advertised via spam. If these reptiles in human form know they're losing money, they may crawl back into the dank holes whence they came.

And finally, if you know someone who works for one of these outfits, give them a good kick in the rear from me.

Dem-Ol'-HD-Icon-Gone-Generics Blues

Q. My hard disk's icon has turned generic, and when I try to paste in a new one, I get a message saying, "The command cannot be completed because it cannot be found." This is the only icon I cannot change. I have tried rebuilding the desktop several times, to no avail. What should I do now?

Ricky Ng
via the Internet

BOB: We answered a question like this way back in the halcyon days of November '94 (page 163). The answer then, as now, is that the invisible Icon file representing the custom icon for your hard disk is damaged.

CHRIS: Or "hosed," as we say in the trade. You need to get rid of it before you can paste in a new one. But it's not that easy. As Bob said, the file is invisible. So first you need a program such as ResEdit, DiskTop, DiskTools, or Norton Utilities that can make invisible files visible. Using one of these tools, find the file named Icon at the root level of your hard disk and make it visible (see figure 1). Quit the utility program, and then drag the now visible Icon file from your hard-disk window to the Trash and empty the Trash. Finally, paste a new icon into the Get Info window.

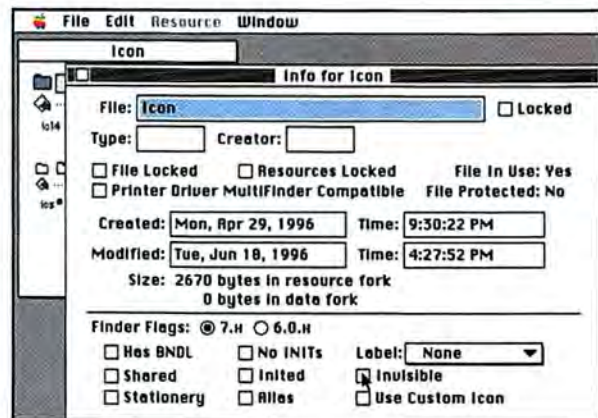


figure 1 / To replace a damaged Icon file, using ResEdit, open the Icon file and then choose Get Info from the File menu and uncheck the Invisible box.

Redundant Sound Manager

Q. I recently installed QuickTime 2.5 and, to my surprise, found Sound Manager in my Extensions folder afterward. I thought Sound Manager was built into System 7.5.3. Can I trash Sound Manager?

Rick L. Himrich
via CompuServe

CHRIS: What you, and countless others, have witnessed is Apple's non-bug-fix bug fix.

BOB: That's as clear as mud.

CHRIS: Just about as clear as Apple's intention seemed when users found Sound Manager 3.2.1 popping up on their hard disks after they installed the QuickTime 2.5 package.

BOB: Rick, we don't blame you for being confused. Sound Manager's tricks are part of the system software, making the extension unnecessary — well, except in this case.

CHRIS: Bob's hit his head on the nail. When running QuickTime 2.5, you should keep the new Sound Manager around. QuickTime 2.5 and System 7.5.3 don't see eye to eye on all QuickTime auditory chores — meaning the two conflict in unfortunate ways. To iron out these petty differences, Apple created a new-and-improved Sound Manager. It installs automatically when you move up to QuickTime 2.5.

BOB: Can't we just call it a bug fix?

CHRIS: Not officially. The darned thing just appeared with nary a word of explanation in the QuickTime Read Me file, and Apple has never claimed that this is a bug fix. Heck, Apple never bothered to explain it at all (although an enlightening Tech Note might be available by the time you read this — we hope).

BOB: Fine. One last thing. The non-bug-fix bug fix isn't universal. If you install QuickTime 2.5 on your System 7.5.3-equipped PowerBook 500, you do need to get rid of the new Sound

Manager. The QuickTime/Sound Manager combination is alleged to distort QuickTime sound on these PowerBooks.

Catch-22

Q. How do I get an uncompressed version of StuffIt Expander? All the copies I find online are compressed in some way — and, of course, I'm unable to decompress them.

Tim Montague
via the Internet

BOB: Well, Tim, you're not

the first person to stumble on this conundrum. And Aladdin Systems, maker of commercial and freeware flavors of StuffIt, has heard this one before too. The company has whipped up a little Web page (<http://www.aladdinsys.com/VISTA/obstufex.htm>) that explains and offers solutions to what it calls the Chicken and Egg Problem. Basically, you need to get a MacBinary-encoded (.bin) copy of StuffIt Expander that your FTP client application (Fetch or Anarchie) can automatically decode into a self-extracting archive. The Aladdin site gives you the complete scoop.

CHRIS: Tim, we'd be remiss if we didn't provide a solution that's probably staring you right in the face. If you're like every man, woman, child, and rodent who's come within a hectare of a personal computer, you possess no fewer than 16 copies of AOL's software. You get these floppies and CD-ROMs in the mail, in magazines, in boxes of cereal, and from passing helicopters. Next thing you know, perfect strangers will pelt you with this stuff as they drive by in the AOL Wienermobile. Not that I'm complaining, mind you. I stopped buying floppy disks years ago, if you catch my drift (and I know you do).

But as well as providing free storage and the software necessary to visit AOL, these disks supply another remarkable service — they contain a utility for unsmushing stuffed files.

Just install the AOL software on your hard disk and double-click on the AOL application. You'll be greeted by a splash screen that offers to walk you through the sign-up process. For the moment, resist the temptation to sign on and instead click on Cancel. Now select Open from the File menu, navigate to your stuffed copy of StuffIt Expander, and click on Open. The AOL software will proceed to unstuff StuffIt, and in the blink of an eye, you'll have joined the ranks of the unsmush-enabled.

Unwanted Help

Q. I haven't touched Balloon Help in over a year, and I have yet to use Apple Guide. Can I save some space by getting rid of these things?

Lori
via the Internet

CHRIS: Boy, oh boy. This month's questions are providing fertile soil for my crop of gripes.

BOB: What's your beef this time?

CHRIS: I hate online documentation that's not accompanied by a hard-copy manual. I know they're ecologically sound, but Apple Guide and Balloon Help are no substitute for a well-written manual.

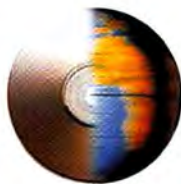
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You can download the benchmarks from ZD Net/CompuServe (GO ZDBOP) or from our World Wide Web home page at <http://www.zdnet.com/zdbop>.

Or, for a CD-ROM (\$5 each for shipping and handling) fax your credit card information to 919-380-2879 or send a check to ZDBOP. Allow 4 to 6 weeks for regular delivery or enclose your FedEx number.

BOB: Hold on a second there, buckaroo. If it weren't for Apple leaving manuals out of the System 7.5 package, my book *Macintosh System 7.5 for Dummies* (IDG Books, 1994) wouldn't be the raging success it is today. Sure, it's fun to write a book about games, but this online-documentation trend is a gold mine for writer types. You ought to look into it.

Hey, I'm kidding! Like Chris, I'm not a big fan of Apple Guide. And because I'm not, I'll tell you how to get rid of it and its related files.

But first, forget about getting rid of Balloon Help. The information in those pop-up balloons is stuck inside the resources of each application. You can empty the balloons with ResEdit, but why bother? Just don't turn on Balloon Help, and you'll never see them.

To get rid of Apple Guide, remove or disable the Apple Guide extension in your Extensions folder. All traces of Apple Guide will disappear from the question-mark icon in your menu bar. If you also want to ditch the other Apple Guide files in your Extensions folder (the ones that contain the actual documentation), open your Extensions folder, choose View by Kind in the Finder, and look for all the files that show up as Apple Guide documents. Some of these things are big — the Macintosh Guide file is 1.8 MB — and you can save yourself a few megs of storage space by trashing them.

CHRIS: Bear in mind that if you throw these helpful bytes away and need them later, you'll have to dance the reinstallation shuffle. If I were doing this kind of housecleaning, I'd move the files to a folder, name it something like Unstuff When You're Clueless, and compress it. Apple Guide documents mush down pretty good — a 4.1-MB folder full o' files compresses to 1.1 MB. Just drop the compressed folder on a floppy (or two, to be safe) and tuck it away in a drawer in anticipation of the day when you're feeling help-less. Of course, you'll need to return the Apple Guide files to your Extensions folder and restart.

Speaking of housecleaning, I came across a cool utility at the last Macworld Expo that simplifies the deleting and aliasing of all kinds of help files. It's called LaundroMac, costs \$69.95 (list), and is from the Excelsior Group (which I suspect is just the *nom de business* of LaundroMac's author, Peter Caylor). LaundroMac's Helper Skelter component creates a list of all the help files on your hard disk — yup, even nonsystem help files from the likes of Adobe, Claris, and Microsoft — and offers you the option of deleting them or

moving the files and replacing them with an alias (a nice option if you want to keep your startup disk slim and trim by storing bigger files on an external disk). LaundroMac can also trim extra code from fat-binary applications, delete unused preference files, trash empty folders, deinstall apps and their components, and resolve aliases (see figure 2).

BOB: I like the idea behind LaundroMac too, but the program isn't as stable as I'd like. I've got a 4-GB drive, and LaundroMac crashed on me more than once, even with all extensions off and its memory partition kicked way up. I suggest trying the demo version before committing to the program. You can find the demo at <http://members.aol.com/ExcelsiorG/Imdemo.html>.

CHRIS: I didn't have the instability problems Bob did, but I did discover that although LaundroMac is deceptively simple to use, it's powerful enough to cause problems if you're not careful. For example, I stripped the fat-binary code out of ClarisWorks 4.0 and ClarisWorks didn't dig it. The program still functions as flawlessly as ever but not without first displaying a dialog box warning me that something has mucked with ClarisWorks' innards and that reinstalling the program wouldn't be a bad idea.

We should restate the hoary ResEdit warning here: With any program that changes code or deletes files, work with a backup copy and test the copy for reliability before trashing the original. In the case of LaundroMac, it may be a good idea to back up your entire disk before getting too delete-happy.

.AFM Files: Who Needs 'em?

Q. Whenever I download a PostScript Type 1 font, the package includes a screen bitmap, a PostScript font, and a file with the suffix .AFM. What is this file for?

Ross Otto
via the Internet

BOB: I thought this was going to be easy. I knew that AFM was the acronym for Adobe Font Metrics and that only a few rare programs use them. I scoured my bookshelf to learn more, but the only book I found (I won't name all

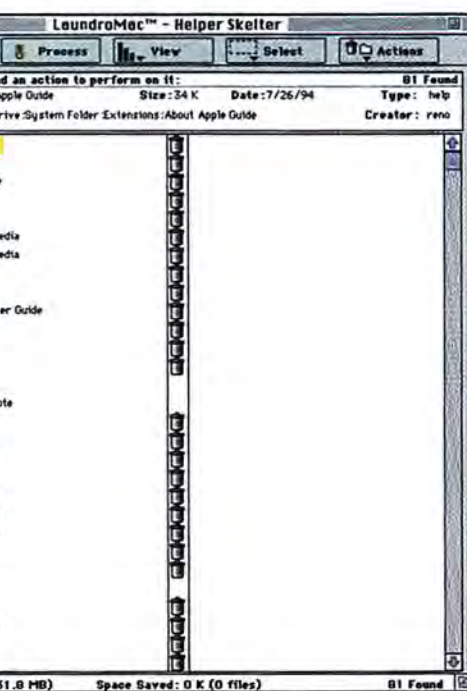


figure 2 / Dirty hard disk? Check out LaundroMac. It can zap help files, remove extra code from fat binaries, and more.

the ones that didn't have it) that contained the information you desire . . .

CHRIS: Uh-oh. Not another plug for one of your books . . .

BOB: Not this time. It's actually a plug for Sharon Aker's excellent and often overlooked *The Mac Almanac* (1994), on the popular ZD Press label. It's the only book in my substantial collection that told me, "AFM files come with many Adobe PostScript fonts. These files contain special information that describes the dimensions of the font for applications that need the information provided that way. (I know of only two applications that use AFMs — FrameMaker and InterLeaf. Bet you never heard of InterLeaf. Bet most of you never heard of FrameMaker, either.) So, you can get rid of any AFM files you have hanging around. (They're text files, by the way, so you can read through them with a word processor if you don't have a life.)"

CHRIS: I couldn't have said it better myself. ☺

Bob LeVitus is the author of 20 computer books and is a columnist for the Houston Chronicle. Christopher Breen recently coauthored The Macintosh Bible Guide to Games, published by Peachpit Press.



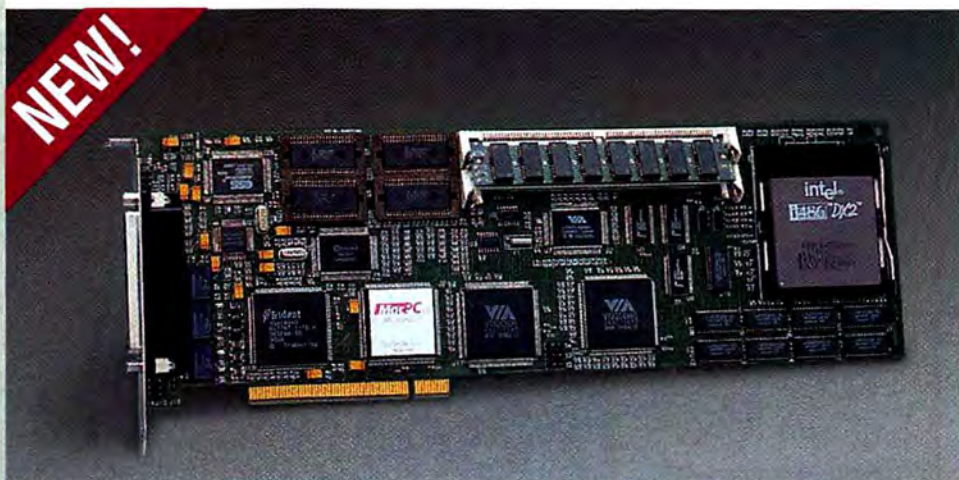
You can find the shareware and freeware programs referenced in this article at *MacUser's Software Central* (<http://www.zdnet.com/macuser/software/>). You can also find them in the *MacUser* areas on CompuServe (GO ZMC:MACUSER) and America Online (keyword MACUSER).

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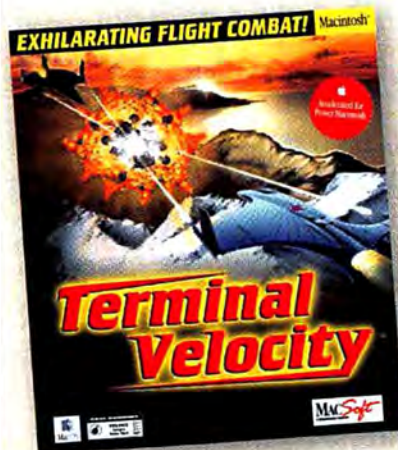


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If the closest you've come to the arts recently is a half-hearted viewing of *Masterpiece Theatre*, it's time to put down that remote.



By Kristin Mellone Balleisen

The Artful Mac

AT A LOSS FOR THINGS TO TALK ABOUT at cocktail parties? Your Mac can fill your head with the kind of information that will not only impress others but also inspire you. So before it's time to

get dressed up for your next gala outing, boot up your Mac, insert a few choice CD-ROMs, and do some discriminating Web cruising. Soon you'll be spouting artspeak like a true connoisseur.

The Written Word

There's more than one way to read the classics. If you want a multimedia experience, pop in a CD-ROM. The three reviewed here are among the best out there, but even they vary in quality.

Macbeth (★★★; \$49.95 list), from Voyager (800-446-2001 or 212-431-5199), can teach even the inveterate Bard follower a thing or two. It's brimming with enough detailed summaries, commentaries, and supplemental notes to put Cliffs Notes out of business. You have a couple of choices for acquainting yourself with this play — you can hear the play in its entirety, performed by the Royal Shakespeare Company, or read the text yourself with the option of skipping directly to any act or scene.

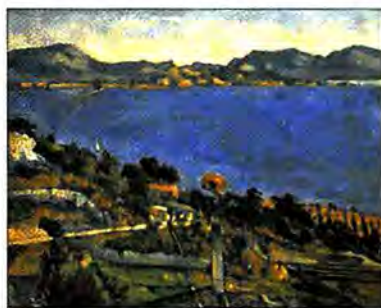
Still, I was disappointed in this CD-ROM. There are only a few video clips, grainy and out of sync with the sound (even on a Power Mac with a fast CD-ROM drive).

If you prefer your prose to be a bit more contemporary, take a look

at Voyager's CD-ROM **The Beat Experience** (★★★; \$39.95 list). This hip primer on the '50s cultural movement is cool right down to its navigational tools. A funky interactive map lets you travel to famous beat sites; for instance, you can see footage of Allen Ginsberg in Lawrence Ferlinghetti's City Lights bookstore, a be-in in San Francisco, or Dizzy Gillespie on his horn in a Los Angeles jazz club. Users not put off by drug references, sexual themes, and a bit of nudity will want to crash at The Beat Pad section of the CD-ROM: Click on the TV to hear President Eisenhower defend the U.S. space program; a stack of records to hear the tunes of Thelonious Monk and John Coltrane; or a book to hear excerpts of Ginsberg's "Howl," William Burroughs' *Naked Lunch*, and Kerouac's *On the Road*. Dig it.

If what you want to focus on is poetry from around that same era and later, you're better off heading straight for a different Voyager title — **Poetry in Motion II** (★★★;

\$29.95 list). This program shows that there's nothing like a poetry reading to make the written word jump off the page — and it's even better when the narrator is the poem's author. You'll hear Robert Creeley reading "Time," his poem about the birth of his son; Helen Adam's savagely wicked performance of "The Apartment"; and Diane di Prima's passionate recitation of "Revolutionary Letter #19." In addition, the CD-ROM has interviews that provide a candid and often funny look at these authors — who their idols are and what inspires them to create.



Virtual Museum

Even more compatible with an electronic environment are the visual arts, and there's plenty to be had on CD-ROM. Although I found more than one program that should be left in its shrink-wrap, others are extraordinary.

Starting with the shelf fillers, Voyager's **Painters Painting** (★★★; \$39.95 list) goes to show that even established companies don't get it right all the time. The poor-quality video and disorganized presentation are part of what make this disc one to skip. It also fails to shed sufficient light on the subject matter it tackles

— Abstract Expressionism, the postwar art movement that gave rise to the likes of Andy Warhol, Robert Rauschenberg, Jackson Pollack, and Jasper Johns. The CD-ROM is based on the film by the same name, which shows these artists speaking openly (albeit often unintelligibly) about their art and influences. The paintings

are vivid and the insider accounts interesting, but the approach is likely to leave those not acquainted with this artistic period more frustrated than enlightened.

But is it art? It is when it comes to an entirely different art title, **Paul Cézanne: Portrait of My World** (★★★★; \$45 estimated street), from Corbis (800-246-2065 or 206-641-4505). This visually stunning powerhouse of a CD-ROM features up-close looks and explanations of 140 Cézanne works of art. It also includes a biography as well as interactive tours of his painting shack in the South of France and the bistro he frequented. The interface caters to all types. It's easy to wander aimlessly — studying the intricate brush strokes of *The Sea at L'Estaque* one moment, skipping easily to an encyclopedic entry about the influence of the press in 19th-century France, and then listening to one of the many narrated vignettes by "Cézanne" himself. This CD-ROM also features an interesting navigational tool — the QuickMove — for those who prefer a more organized approach to viewing. It lets you see where you've been on the CD-ROM as well as all the areas you might want to view. This disc gracefully walks the line between education and entertainment and will please the art neophyte as well as the sophisticated.



Don't have the cash on hand to fly to France to see some of the world's greatest art? You can still get the art education you seek, from **Le Louvre: The palace and its paintings** (★★★★; \$49.95 list), from BMG Interactive Entertainment (800-221-8180 or 212-930-6768). This CD-ROM manages to impart an impressive amount of subject matter, although it does so dryly. You can enter the palace section, where you hear lectures or read texts on how 800 years of history has affected the growth and modifications of this world-famous museum. Unfortunately, the CD-ROM shows only a few photos to illustrate a complex history.

Most users will want to get right to the good stuff — the Louvre's unmatched art collections. You can hear and read about a particular work and its creator, zoom in for a close look, and even see where the work hangs in the museum. This portion of the CD-ROM is almost as good as being there, and you're spared the fare of the transatlantic flight.

Postimpressionist Vincent van Gogh is famous for two things: his vividly colorful works of art and his reputation as a mad genius. However, in **Van Gogh: Starry Night** (★★★★; \$39.95 list), from Voyager, UCLA art historian Albert Boime hopes to debunk the latter part of the legend. This is a limited subject for a CD-ROM, to be sure, although Boime's painstaking lecture, an excellent interface, and a 2.5-MB scrollable version of the painting *Starry Night* make this disc worthwhile.

Get Your Art Online

Not surprisingly, the Web is well populated with art-related info. Among my favorite sites are those of the **Los Angeles County Museum of Art** (<http://www.lacma.org/>), which offers generous samplings and descriptions of art; the **American Ballet Theater** (<http://www.abt.org/>), complete with synopses of ballets; and the **Boston Symphony Orchestra** (<http://www.bso.org/>), which has everything from a schedule of concerts to a map of the instruments onstage.

Literature fans and prospective authors should cruise by **The Etext Archives** (<http://www.etext.org/>). There you'll find a surprising range of literature, from Virgil's *Aeneid*, written in Latin, to fine e-zines such as SciFaiku (science-fiction haiku) and Kudzu (poetry, short fiction, and essays).

At the End of the Tour

If all this keeping up on the world of art is starting to feel a little too highbrow, visit **Boston's Museum of Bad Art** (<http://glyphs.com/moba/>). This site promotes paintings of dubious quality rescued from Boston dumpsters. ☹

Kristin Mellone Balleisen, a former MacUser assistant editor and MacWEEK reporter, is currently the Web Goddess (OK, not her real title) at The John F. Kennedy Center for the Performing Arts (<http://kennedy-center.org/>), in Washington, D.C.

The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

RIK: It's hard raising kids in California.

JIM: You've gotta be kidding. The mere fact that I don't have to bundle Bailey into a snowsuit every winter makes it heaven on earth.

RIK: But Bailey's not yet two. Wait till she's old enough to be seduced by this state's pernicious Prime Directive: Thou shalt have fun.

JIM: Fun's bad? For kids?

RIK: No, fun's fine — but not everything *is* fun. And kids get so hypnotized by the Prime Directive that they soon believe that if something isn't fun, it isn't worth doing.

JIM: I see a discussion of one of Rik's favorite educational obsessions approaching. What's it this time? The demise of the subjunctive mood?

RIK: I wish it were. No, I'm concerned with something far more fundamental: that much of today's so-called educational software seems designed more to indulge Johnny and Janey than to teach them.

JIM: You're a big Edmark fan — how about its new **Mighty Math Number Heroes** ▶, right?

RIK: Yeah, but the Edmarks of the world are few and far between. For every Millie's Math House (newly updated, by the way) there are a dozen tedious titles such as ◀ **Professor Finkle's Times**



Table Factory.

JIM: That's pretty rough. At least the maker of Finkle is trying to make multiplication fun.

RIK: Maybe it isn't.

JIM: How about encapsulating math instruction, then, in an arcade-game format, as **Major League Math** does?

RIK: My little-leaguer, Carey, goes for it, but not ballerina Roxanne.

JIM: Surely you can't fault a beginning-math program such as **Nick Jr.: Play Math!**, which teaches basic concepts of shapes, sorting, and counting.

RIK: OK, I'll yield — but let's not lull kids into thinking that all learning is effortless fun and that if something's difficult, it's to be avoided.

Major League Math ★★★★★

Ages: 9 – 13.

Price: \$29.99 list (CD-ROM).

If your kids are baseball fans, they'll enjoy answering a broad range of math and baseball-trivia questions to help their favorite Major League team beat a dreaded rival. Great 3-D animations. Company: Sanctuary Woods, San Mateo, CA; 800-943-3664 or 415-286-6000; <http://www.sanctuary.com/>.

Reader Service: Circle #421.

Mighty Math Number Heroes ★★★★★

Ages: 8 – 11.

Price: \$39.99 list (CD-ROM).

An assortment of amusing superheroes hosts a series of activities that teach statistics, fractions, geometry, and basic arithmetic — with varying degrees of success.

Company: Edmark, Redmond, WA; 800-691-2985 or 206-556-8484; <http://www.edmark.com/>.

Reader Service: Circle #422.

Nick Jr.: Play Math! ★★★★★

Ages: 3 – 6.

Price: \$19.99 list (CD-ROM).

Simple counting, pattern-recognition, and sorting activities are enlivened by an amusing cast of characters. Excellent progress-report features. Company: Viacom New Media, Buffalo Grove, IL; 800-469-2539 or 970-339-7103; <http://www.viacomnewmedia.com/>.

Reader Service: Circle #423.

Professor Finkle's Times Table Factory ★★

Ages: 6 – 11.

Price: \$39.95 list (CD-ROM).

If your kids can endure the smarmy characters in the hokey instructional videos, they might learn basic multiplication skills and shortcuts. Company: Sing 'n' Learn Software, Kaysville, UT; 800-723-5642 or 801-451-9162; <http://www.xmission.com/~snls/sng&lrn.html>.

Reader Service: Circle #424.



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The Game Room

BY ROMAN LOYOLA

THE NAME OF THE GAME is complication, or so it seems with many games nowadays. It's not uncommon for a game to come on multiple discs, include manuals of over a hundred pages each, and take weeks or even months to complete. For this month's Game Room, I'm taking a break from those convoluted games and looking at a few that let you install, read the instructions, and get the hang of the controls in under 15 minutes.

Indiana Jones and his Desktop Adventures

If you're looking for some quick, no-frills satisfaction from an adventure game, take a look at Indiana Jones and his Desktop Adventures. It's the latest in the Indiana Jones series, from LucasArts, which has been known for nice-looking graphics and complex game play. Desktop Adventures is a departure from that pattern. You won't find yourself gasping in awe over this game's cartoonlike graphics. But the lack of

GAME POINT

Indiana Jones and his Desktop Adventures is great if you're looking for a no-frills adventure game. It looks and feels like shareware, and it's priced like it too. I also recommend GearHeads, which has a simple premise but involves some keen strategic thinking and is peppered with humor. The other game I reviewed this month, AstroRock, is unoriginal and boring. Rather than waste money on it, fork out the shareware fee for the similar game Maelstrom or the more strategic game Escape Velocity.

Indiana Jones and his Desktop Adventures

Price: \$20 (estimated street).
Company: LucasArts Entertainment,
San Rafael, CA; 800-985-8227 or
415-472-3400.
Reader Service: Circle #425.

GearHeads

Price: \$40 (estimated street).
Company: Phillips Media, Los Angeles,
CA; 800-883-3767 or 310-444-6500.
Reader Service: Circle #426.

AstroRock

Price: \$30 (estimated street).
Company: Atlantean Interactive Games,
Van Nuys, CA; 800-822-8339 or
818-908-9663.
Reader Service: Circle #427.



jaw-dropping graphics makes the game playable even on a 68030-based Mac.

The game play is also simple; it's designed to let you progress quickly. The playing field — a Central American jungle in the 1930s — is small. The portion of the playing field you can see at one time takes up only a small portion of your screen (about a quarter of a 16-inch monitor set at a resolution of 640 x 480 pixels). Although you end up traveling over a large area — by scrolling left and right, up and down — to see the rest of the playing field, you never have to travel far to progress. If, for instance, you need an amulet during a mission, you don't have to go far to find it.

Simplicity alone doesn't make a game fun to play. This game also has enough complexity to keep your interest. Your mission starts out simple — for instance, you may need to rescue a local resident who's been kidnapped or find an ancient pendant before it falls into the wrong hands. But the mission quickly becomes more complicated as you travel through the jungle. There are plenty of puzzles to solve, and you have to go through complex negotiations with the locals to get the tips you need. For instance, one character may want a jade treasure

in exchange for a tip, but to get the treasure, you may need to trade a guitar or a whip with another character. Nearly all the characters want something from you. Despite the multiple twists, each mission takes only about half an hour to an hour to finish. This game is all about quick satisfaction.

GearHeads

The premise of GearHeads is simple — send 21 windup toys to your opponent's side of the playing field before your opponent does the same

to you. But just when you think you've mastered the game, new toys appear that require new thinking.

You start the game with an unlimited number of windup toys in a toy chest. There are 12 types of toys, each type with its own special characteristics — one can blow things up, another type (shown in background) can push back your opponent's toys, others can move at angles and teleport to different places on the playing field.

The winning strategy isn't simply a matter of letting your toys make a mad dash for the other side. You have to try to get around an opponent who's blocking your moves (the computer makes a particularly challenging opponent), and you have to learn how to work your toys. For instance, before you release a toy, you have to wind it up (by holding it down). If you don't wind it up enough, it may run out of energy in the middle of the playing field. You must also keep an eye on the toys coming at you from your opponent and pick the right toys from your toy chest to block them. If a toy bug comes your way, you should send a toy bulldozer to push it back. Keeping track of so much makes for frenzied action, during which you must have the patience to keep up your defense.

This game would be better if you had the ability to add even more variety to it. If you could make your own playing fields and toys, by using map and toy editors, this game would be a must-have.

AstroRock

AstroRock attempts to make the familiar Asteroids game theme — fly-around-and-shoot-anything-that-moves — new again. Unlike Asteroids, this game has full-color graphics, a rock-and-roll soundtrack, and a boatload of weapons and enemies. Although these new twists help and the sound in particular is impressive, they aren't enough to make the game worthwhile — in fact, the game is so simplistic it's boring.

The new elements make the game look more complex. You have plenty of enemies to destroy while you're flying through space — asteroids, gloops (blob-shaped aliens), spikeballs, and renegade rockers are just a few of the enemies that can blow you to bits. To help you in your mission, you can acquire power-ups, such as rapid-fire capability, by picking them up as they float through space. In addition to your standard gun, you can get rapid-fire, spread-fire, or Astro-Smasher power-ups.

Even though the combination of enemies and arsenal makes for some hectic action, no real strategy is needed — survival is merely a matter of blowing up anything that gets too close to you.

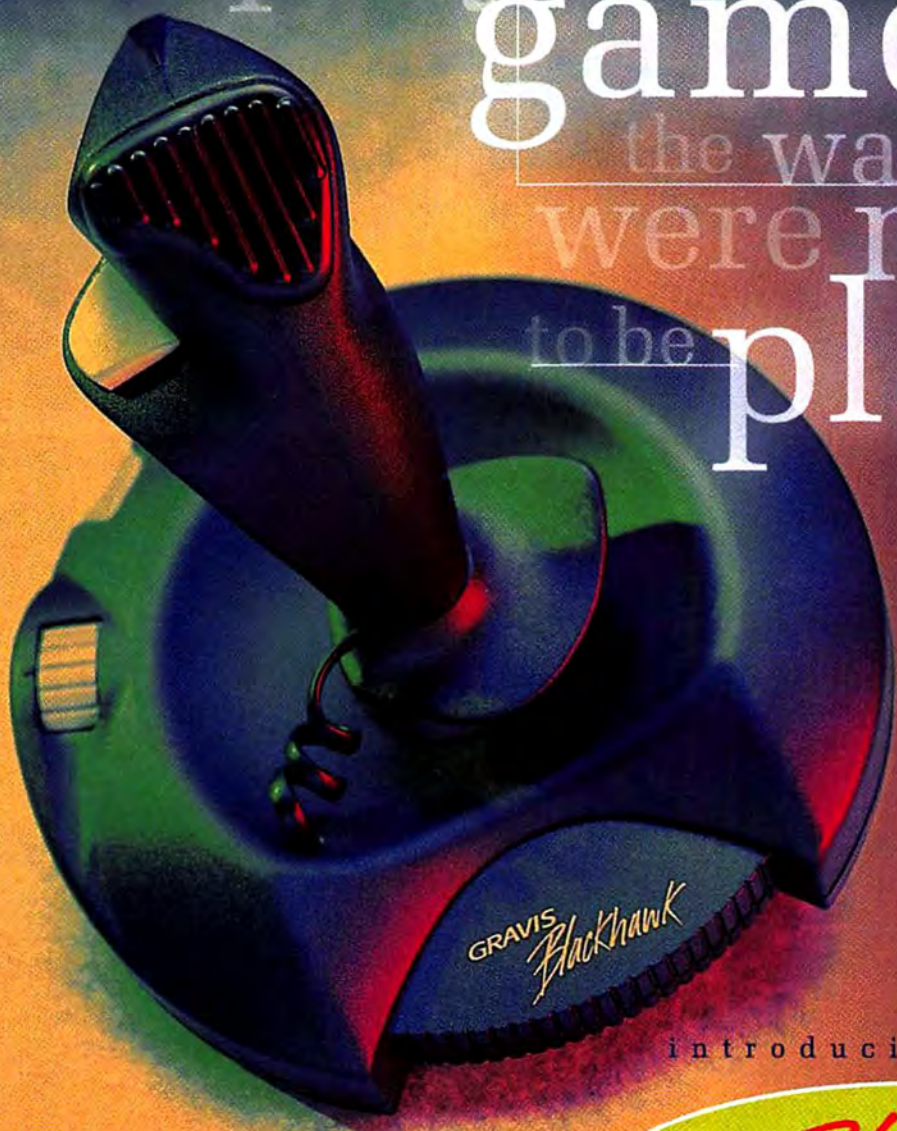
Instead of shelling out the cash for AstroRock, you can get a similar, shareware game — Maelstrom, from Ambrosia Software — and pay only half the price. If you want strategy to go along with the action, try Escape Velocity, also from Ambrosia. You can get the satisfaction of blowing up spaceships in this game, but you have the option of choosing cerebral missions too. For instance, you can challenge yourself to make your fortune establishing outer-space trade routes and blow up other spaceships.

About the only advantage of getting AstroRock rather than one of these shareware games is that AstroRock supports up to eight players on a network.

Roman Loyola is a MacUser associate editor who writes The Game Room to take a break from editing stories about hard drives, digital cameras, and Fast Ethernet.

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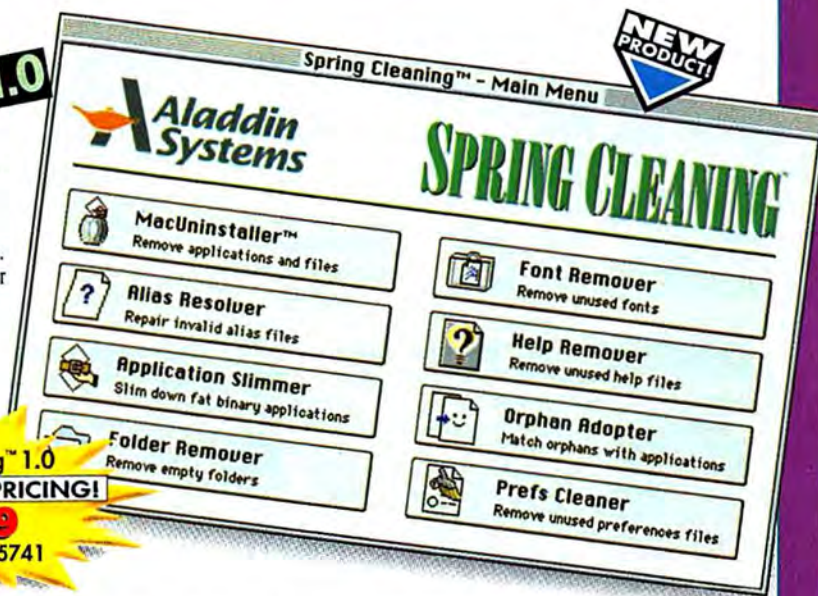
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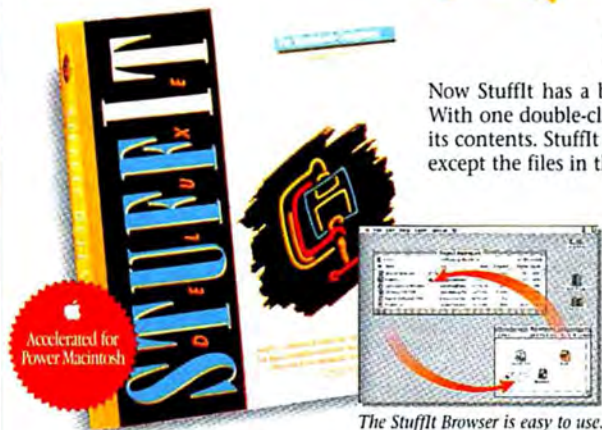
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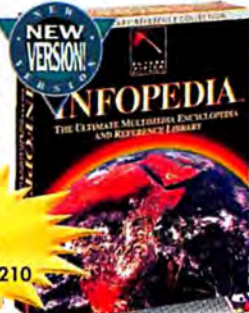
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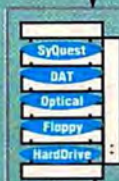


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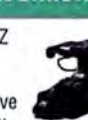
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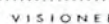
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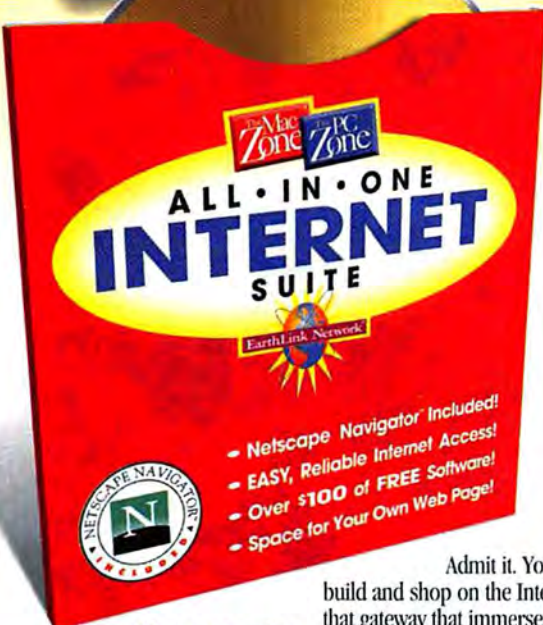
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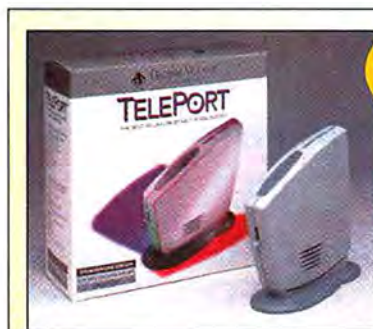
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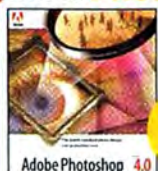
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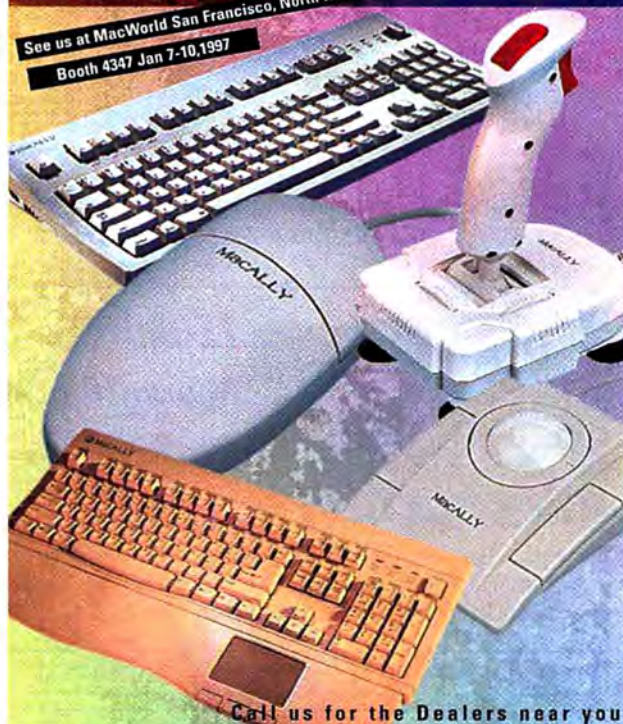
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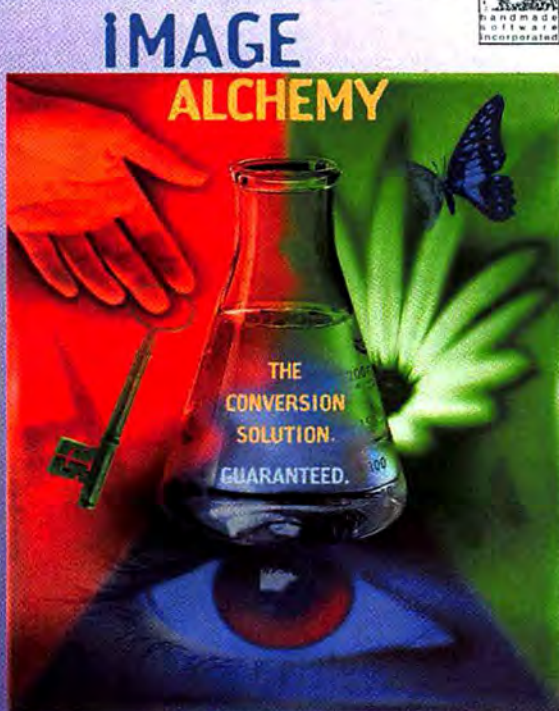
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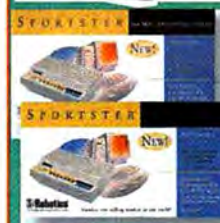
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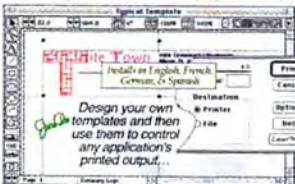
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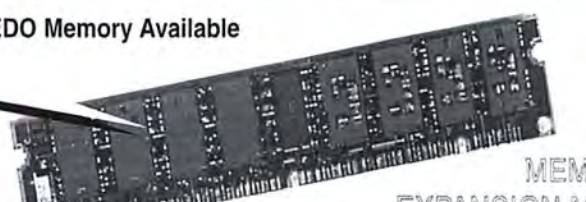
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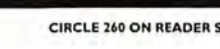
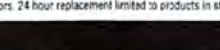
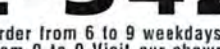
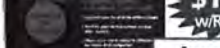
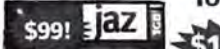
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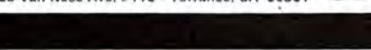
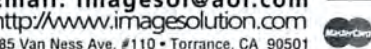
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BUSINESSCARD

MacUser
MARKETPLACE

MacUser's BusinessCard section is a forum for innovative, hard-to-find and low-cost MAC products and services. Ads are listed by product category and include Reader Service numbers to allow fast, easy response.

RATES:

1 issue-\$535, 6 issues-\$505, 12 issues-\$485.

Multiple-ad per issue rates also available.

Prepayment must accompany each insertion.

AMEX/VISA/MC welcomed.

AD FORMAT:

MacUser will typeset each BusinessCard ad.

Advertisers should furnish typewritten copy. Ads include: 1) Headline (1 line, initial caps=30 characters max, all caps=25 characters max), 2) Descriptive copy (5 lines, 225 characters max), 3) Company name (same specifications as headline), and 4) Address and telephone number

(2 lines, 40 characters per line). No logos, artwork or camera-ready ads. Publisher reserves the right to edit supplied copy to meet section specifications.

DEADLINES:

MacUser is published 12 times a year.

The BusinessCard closing is approximately two months prior to issue date.

Please send copy and payment to:

MacUser BusinessCard, One Park Avenue, 3rd Floor, New York, NY 10016.

ATTN: Bill Herbst

For more information, call Bill Herbst at

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ANDY IHNATKO

Junk-Mail Jihad

IF RALPH KRAMDEN AND ED NORTON had been born 40 years later and we were watching their antics today instead of in the '50s, there'd be two big differences:

The first thing is that they'd wind up in the Internet Marketing business. Remember that these are the guys who invested their lives' savings in enterprises such as The Handy Housewife Helper and a miracle hair restorer and glow-in-the-dark shoe polish. One finds it easy to imagine Ralph bumping into a salesman at the pool hall and then streaking home with a \$100 database of e-mail addresses under his arm, ears still ringing with the words "It's not a pyramid scam . . . it's a *multilevel marketing plan*."

The second surefire thing is that the episode in question wouldn't end with the familiar shot of Ralph admitting he's a major doofus and kissing Alice. No, it'd end with a throng of Internet purists clubbing him unconscious behind the bus depot.

Yes, I've finally had it with all the junk e-mails I've been getting.

Of course, the first question that comes to mind on the subject of junk e-mailers is, Is it legal? Well, who cares, really? Junk mail used to arrive in my electronic mailbox maybe once a month, but now it seems like I wade through at least a dozen messages every day. Indeed, after receiving three consecutive offers to purchase access to the Latex Nurse Uniform Fetishist Web site, my fantasies turn instead to doing things to junk e-mailers that make Ralph's bludgeoning look like a merciful act.

Many people whose in boxes aren't deluged with even a fraction of the friendly e-mails and press releases I receive find themselves spending a dollar a day to receive nothing *but* junk, and trying to stop that incoming flood is about as time-consuming as waging a land war in Asia and destined to meet with about the same success. Junkers get their address

lists from hands-free software that trawls through postings on Usenet and commercial services as well as membership directories. The only guaranteed way to block them is to unplug our modems. Since that's not an op-



tion (for me, anyway), we're left to figure out how to deal with the problem after the fact.

You can try to ignore it and just delete the junk without reading it. The attraction of this approach is that it wastes the least amount of your time and money, but it's counterproductive. The immoral weasel-scum losers in the junk-mail business claim that every piece of junk mail that goes unanswered is tacit support for their activities.

Many junkers promise to remove you from their mailing lists if you simply reply to their message with *REMOVE* in the subject header, but isn't it a moral defeat to be forced to waste your time and money asking someone nicely not to waste your time and money?

Feel Lucky, Junk?

A true guerrilla defense against junkers requires techniques that are satisfying to the soul but that meet with varying success. From reporting all junkers to each of the dozens of sysops who handle their message traffic, to setting up complex filters to defend your

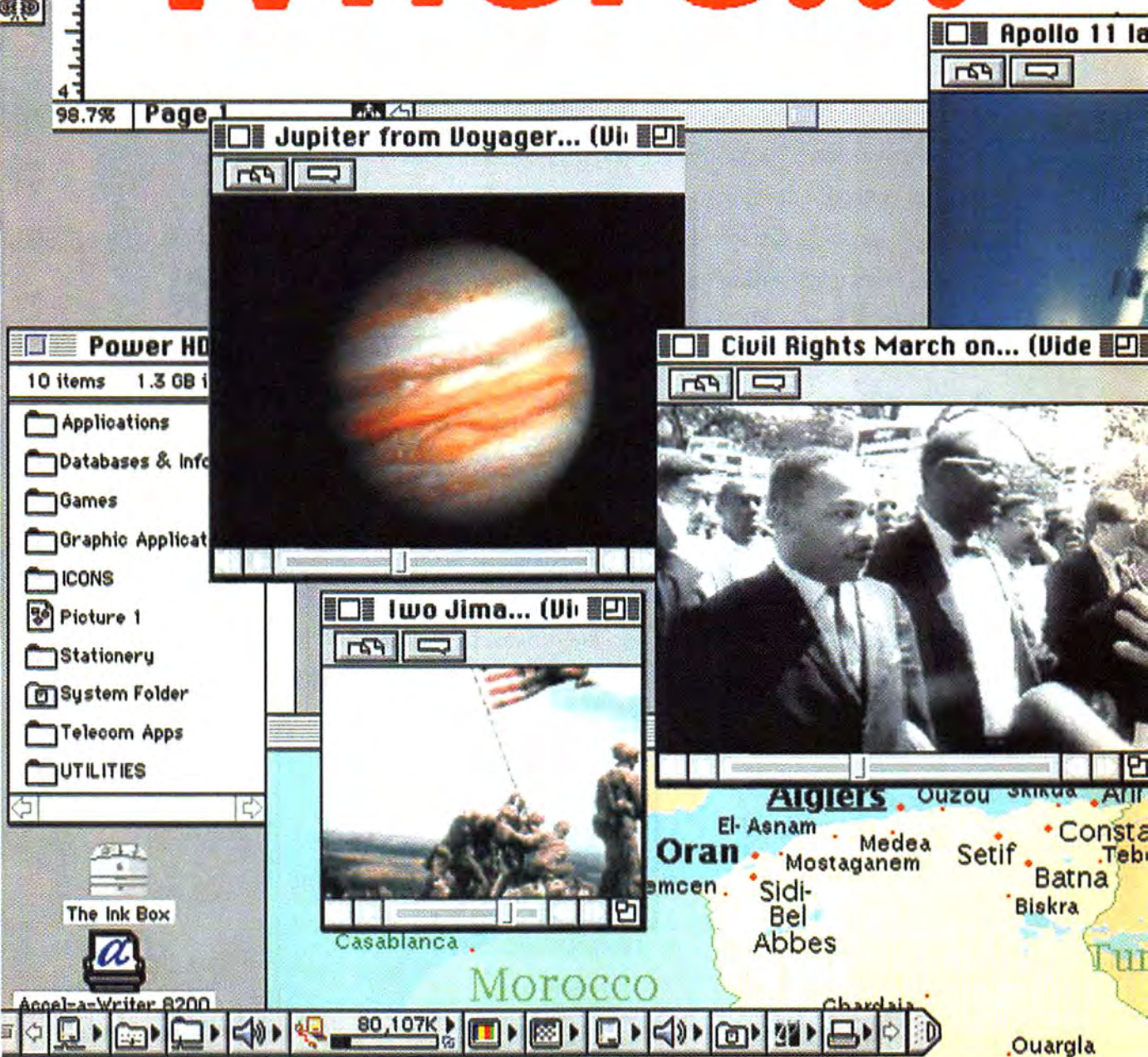
mailbox from incoming garbage, to actually trying to bring the junkers' hardware down, everyday life in the Junker Jihad is active warfare. For specific techniques, go to <http://www.ptbo.igs.Net/~shawn/junkmail.html> and frequent the news.admin.net-abuse.misc newsgroup. But don't attack the junkers' hardware. That Would Be Wrong.

The sad fact is that no effective defense exists against pinheaded gravy suckers who think they have a constitutional right to waste your time and money. Even when America Online head honcho Steve Case directed all his resources against the most flagrant Internet abuser of his customers' accounts, he met with only limited success.

No, the only real solution is legislative. You may have heard of the so-called Junk Fax Law (USC 47.5.II section 227), which bans the practice of sending junk mail by fax; many in the Jihad have claimed that as worded, it applies to junk e-mail as well and therefore dictates that each e-mail the junkers transmit entitles each recipient to a \$500 judgment. This opinion is, unfortunately, highly speculative, I'm told. No, as much as I hate to suggest that you start communicating with unsavory types, I'm begging everyone to write to their Congresspeople to ask for legislation specifically banning the use of electronic mail to transmit unsolicited advertisements for goods and services and specifying fines for *each transmitted message* to be paid by the advertiser.

The same reasoning that went into the Junk Fax Law applies to e-mail: The recipients bear the cost of the ad, and when mailboxes fill with junk, the recipients are then effectively cut off from anyone who might want to send them *real* e-mail. OK, I know that I called all those Congresspeople complete selfish codswaloping losers back when I wrote about the Communications Decency Act, but let's not remind them about that. Let's instead entreat them to do what's right. And that includes the Congresspeople who've slept with Cher. ☞

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