



EXCLUSIVE

The First Test: Macworld
Lab and the Dual-1.25GHz
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The Mac Product Experts

November 2002

Macworld

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Expert Advice from David Pogue
Christopher Breen's Hidden Gems
Great Productivity-Boosting Tips
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


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ANDY IHNATKO

Steve Jobs for mayor? Sure, if iSync and Rendezvous are big hits.

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86 Go Dynamic with GoLive

GLENN FLEISHMAN

Add dynamic content to your Web site—we'll show you how to connect Adobe GoLive 6 to a MySQL database server.

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Force-quit the Classic environment from the Dock, rename directories without confusing applications, command OS X's Terminal application, format with Unix File System, and decide whether you can live on OS X alone.



On the Cover
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November 2002

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Incorporating MacUser

COVER STORY

60 Tame Jaguar

DAVID POGUE

There are some things in life that are beyond your control, but your operating system shouldn't be one of them. From little-known shortcuts to hidden tools, we show you how to work the latest version of Mac OS X.

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70 Apple's New Dual-G4 Macs

JONATHAN SEFF

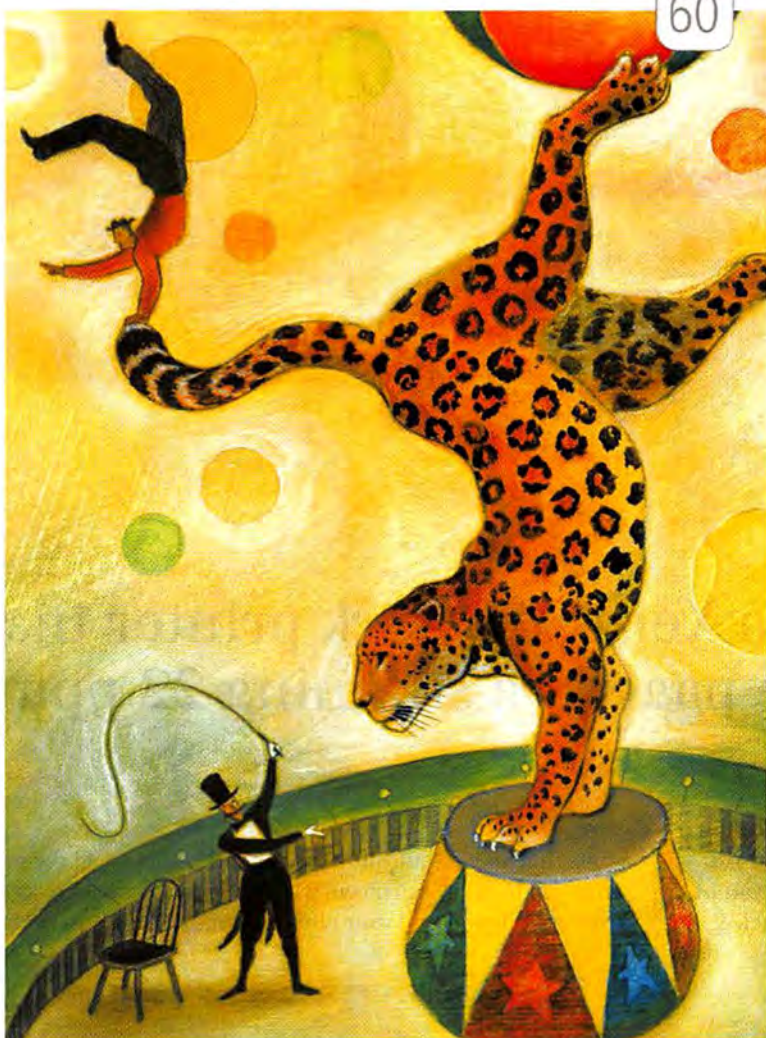
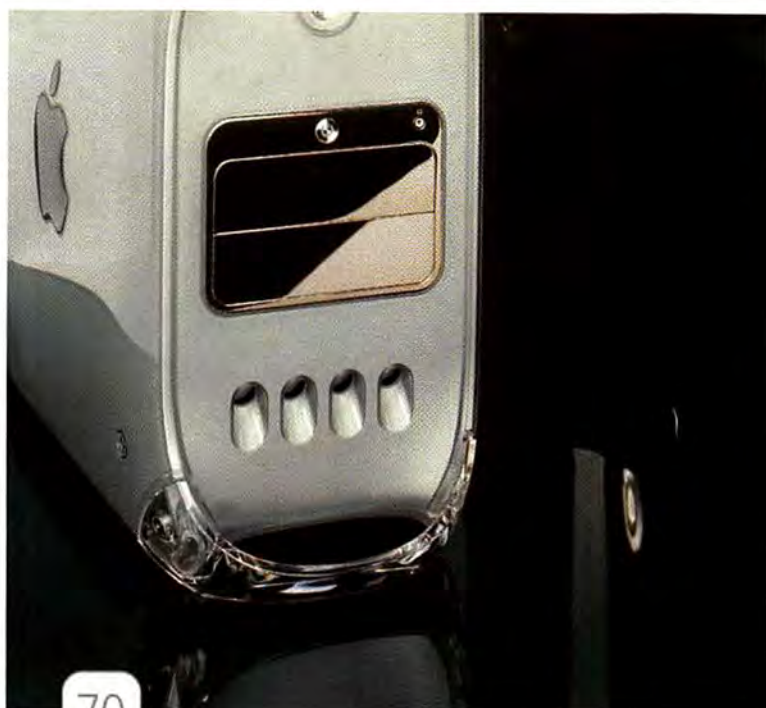
Apple's latest Power Macs sport two processors and new architecture. We dissect them and rate the two shipping models.

78 Serve It Up

SCOT HACKER

Mac users no longer have to take a backseat when it comes to designing and maintaining high-powered, database-backed Web sites. We'll step you through the process of installing an open-source server and database.





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Getting to the Bottom of Apple's New Power Macs

Testing Our Resolve



THERE WAS QUITE A BUZZ ON THE INTERNET AFTER APPLE announced its new Power Mac G4s in August. A few Web sites published test results, claiming that the midrange model, with two 1GHz processors,

wasn't any faster than the previous model (which also had twin 1GHz chips), despite the purported faster bus and subsystems, DDR RAM, and other enhancements to the new desktop computers' architecture. The conclusion many people came to was that Apple was lying about any real advances in the new machines—which is a pretty serious allegation. But in fact, this is just an instance of marketing hype running up against users' expectations; the reality, as always, lies somewhere in the middle.

As you'll see in this month's feature "Apple's New Dual-G4 Macs," our test results corroborate the Web-site reports: in many of our standard tests, the new dual-1GHz Power Mac wasn't any faster than the previous dual-1GHz model. Of course, the new one now makes up the middle of the Power Mac line; the old one was at the top of the line (with twice as much speedy Level 3 cache RAM) and, when it debuted earlier this year, cost \$500 more than the new system. The fact that the new model has two hard-drive buses and two optical-drive bays is also a plus, although this is offset somewhat by the higher cost of DDR RAM. But in the end, I see these new systems as an improvement.

The new high-end model, with two 1.25GHz PowerPC G4 processors, wasn't shipping when we wrote our review, but Apple did let us run our benchmark tests on a preproduction model so we could get a sense of the potential speed increases at the top of the Power Mac line. We were pretty impressed with what we saw, and we think that Mac users who are always chasing after the fastest Mac system available will be, too. But understand that we were able to review and rate only the two lower-end Power Mac models this time around. We'll review and rate the dual-1.25GHz machine after it ships, which *should* be by the time you read this.

Dealing with Changes

Apple claims that these new Power Mac systems' important architectural changes offer tangible benefits to end users—and in our look at the new systems, Jonathan Seff thoroughly explains where and why users will see improvements.

Testing hardware is a tough task, and there are plenty of problems you must confront if you want to

do it right. Architectural changes, and software and operating-system updates, make it nearly impossible to amass a database of tested systems that can be compared with one another over time.

What's even harder is determining which tests make sense, especially when systems change so dramatically. A test that was reasonable two years ago might now be superfluous, and a new test may be needed to demonstrate how system changes affect performance. We're constantly on the lookout for new tests (or modifications to old tests) that can add more pertinent information to a review.

In our review and analysis of these important new systems, we've attempted to cut through the hype and clearly lay out the benefits of Apple's changes. If you're looking to purchase a new desktop Mac, we hope that you'll walk away understanding Apple's motives for the upgrade—and that this information will help you decide whether now is the right time to buy.

Jaguar Unveiled

If you're a Mac user, and as long as you don't mind crowds, the place to be at midnight on August 23 was at an Apple Store (or one of the independent Mac retailers scattered about the country). At the Palo Alto Apple Store, the one nearest Apple's headquarters, there were reportedly 3,000 people queued up, ready to buy Mac OS X 10.2 (or Jaguar), along with new Macs, iPods, and assorted digital-hub goodies.

If you've got Jaguar up and running, you'll definitely want to check out this month's feature on mastering the new OS ("Tame Jaguar"). Longtime *Macworld* contributors David Pogue and Christopher Breen have each come up with a boatload of tips and tricks that will help you maximize your productivity in OS X 10.2. □

Testing hardware is a tough thing, and there are plenty of problems you have to confront if you want to do it right.

Let me know what you think about the new Power Macs, *Macworld* in general, or anything else Mac-related. Drop me an e-mail (rick_lepage@macworld.com) or join in the discussions in our forums (www.macworld.com). To sign up for our weekly e-mail newsletter, which includes exclusive commentary and tips on hot topics, as well as reports on key new products, click on the Newsletters tab on our home page.

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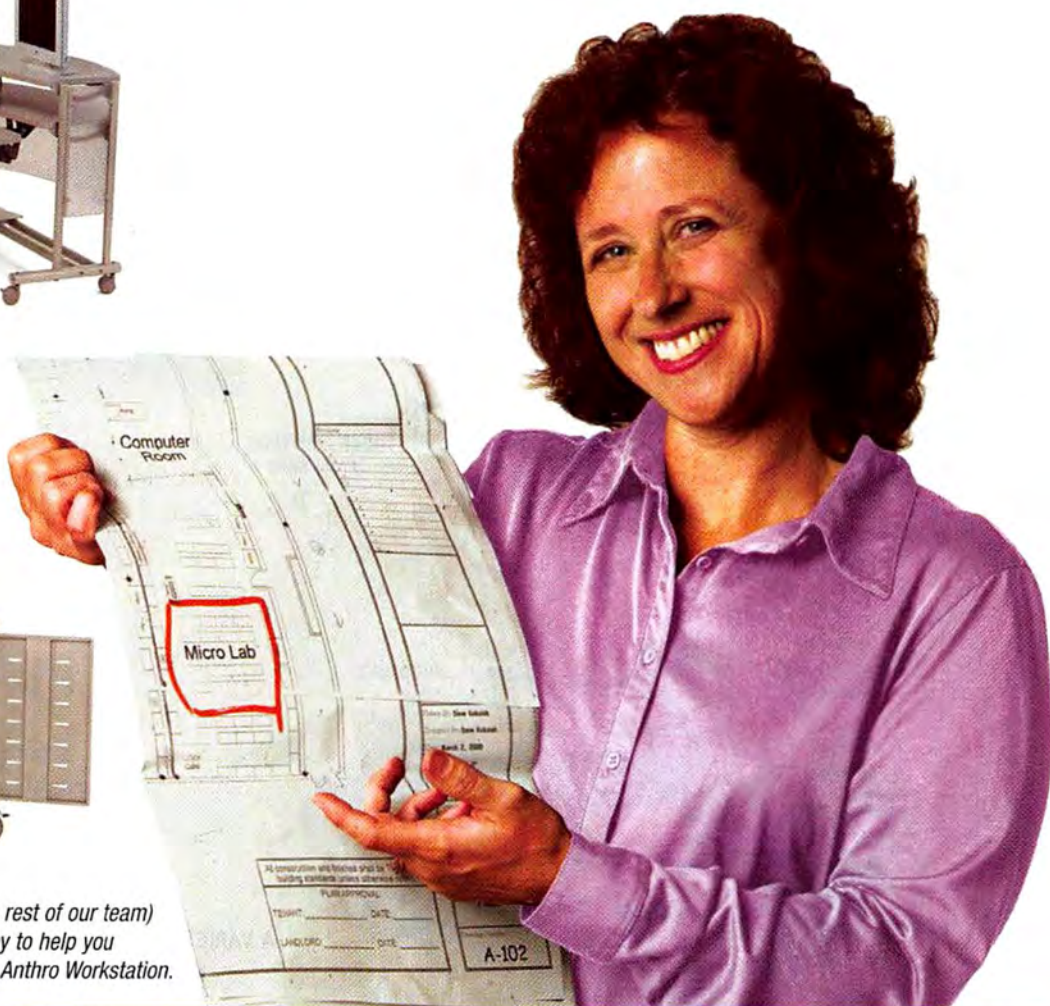
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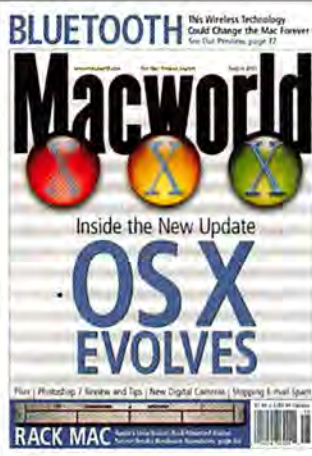
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FEEDBACK

Take Our Advice

The August 2002 issue brought out our readers' inner Dear Abby: Many had advice for Apple, on OS X's Jaguar update. Adam C. Engst's article on stopping spam filled our in-box with e-mail messages—most of it welcome advice, we're glad to say, not information about get-rich-quick schemes. But our readers saved their most strongly worded advice for other readers—August *Feedback* letters that praised QuarkXPress as better than Adobe InDesign had InDesign defenders suggesting which lake XPress partisans could go jump into. Don't believe us? Our advice is to keep reading. □

Spotting Jaguar

RICHARD PRIESING

"Mac OS X Evolves" (August 2002) was interesting, but it overlooked the inclusion of CUPS in OS X 10.2. CUPS is important because it will finally solve all the problems caused by the lack of native PostScript PPDs for OS X. I'm the head of the prepress department for a commercial printer, and CUPS should provide our workgroup with a solid PostScript print server to replace the aging PrintCentral that we currently use. I have a copy of the CUPS handbook and hope that Apple has given CUPS a user interface or back end so that we can get the most out of the system without having to resort to using the Terminal application to input our commands.

BRENT ANGLIN

As one of the attendees of the MacMania cruise to Alaska ("Uncharted Waters," *From the Editor's Desk*, August 2002), I have to tell you that it was the trip of a lifetime. This trip gave me the knowledge and confidence to convert to OS X permanently, and I'm eagerly anticipating the release of Jaguar. I'm convinced that OS X is the best thing that has ever happened to the Mac. It's not only the most elegant operating system I have ever seen but also the most powerful operating system I have ever used. Many features of OS X's Unix underpinnings even turn the heads of my Linux supergeek friends.

JOE GIUSTRA

Macworld reader Ross Bishop is too kind in characterizing OS X's privilege paranoia as "a monumental pain" ("OS X Insecurity," *Feedback*, August 2002). It's evident that the Mac has abandoned

being the computer for the rest of us and remains the computer of the corporate world. As a sole user, I am constantly stiff-armed by the privilege lockout of my files. Apple must give us the option of switching off the sufficient-privilege lock. Otherwise, it should present itself as a manufacturer of network servers, not of personal computers. There is nothing "personal" about a computer that seems to control the user and acts like a terminal computer.

DAVID SHORT

While Jason Snell cruises the Inside Passage ("Uncharted Waters"), many of us are feeling increasingly alienated by Apple. After 15 years as a Mac enthusiast (converting my office along the way), I now find myself betrayed by OS X. Any system as non-user-friendly as OS X deserves to lose customer loyalty. It's ridiculous that Mac users now have to learn lines of command code. It's not a step forward; it's a step backward, to the bad old days of FORTRAN and COBOL. Windows looks more and more attractive. Someone needs to apply this command to OS X: `sudo rm -rf ~/.Trash/`.

EDWARD JANNE

I am sick and tired of all these OS 9 throwbacks who have dug their hooves in against change. Way back when OS X apps were few and far between, I might have understood why people would have complained if Apple had put pressure on to switch to OS X. But now that most old-time favorite apps have stepped up to OS X, and many new and innovative apps have appeared, to complain that OS X's security features are cumbersome is to just nitpick. Unless you've used Windows, you don't know

what cumbersome is. Anyone who knows anything about computers at all knows that attaching a user interface to Unix is no easy task. That Apple has managed to do this and still retain such incredible ease of use is amazing. A sole user may not appreciate all the multiuser features under the pretty face, but I wouldn't trade memory protection and true preemptive multitasking for marginal convenience. I've been using OS X since version 10.0, and now I can't even look at an OS 9 desktop without feeling confined.

Putting Spam on Ice

WERNER J. SEVERIN

Perhaps "Stop Spam!" (*Secrets*, August 2002) should have noted that the Federal Trade Commission is interested in having unsolicited spam forwarded to uce@ftc.gov. Apparently, they go after the most-egregious violators.

LUKE PACHOLSKI

While filters may shield users a bit from spam, filters don't do anything to stop it. Spam will be reduced or stopped only if people fight back. That means reporting spam to the ISP it comes from, either manually or automatically via a service such as SpamCop.

AARON SHEPARD

Here's another spam-stopping tip to go along with those in your article: Stay off of EarthLink. I recently got an EarthLink account, and within two days I was receiving spam at that address—despite the fact that I had not yet used that address, given it to anyone, or even entered it in my browser or Internet preferences.

Retrospect Perspective

STEVE SULLIVAN

I have no doubt Retrospect Backup 5.0 is an excellent program (*Reviews*, July 2002), but I went to Dantz's Web site to confirm that my LaCie CD-RW drive was compatible with it, and I didn't find it listed. Since then, I've e-mailed Dantz, asking for confirmation that my drive will work with the program, but I haven't received a reply from any department I've tried to contact—from tech support to sales to customer service. I consider this to be extraordinarily poor customer service, which gives me misgivings about buying the product. It's just not acceptable to completely ignore a customer who wants to give you money.

Frustrating FileMaker

STEVE NOBLE

I can't tell you how disappointed I am in the new FileMaker Pro 6 ("New Tricks, Fewer Clicks," *Mac Beat*, August 2002). FileMaker is an excellent program, but it

lacks many features, such as multiple tables in a single file, event-triggered scripts, customizable menus, and more. Some of these items are available through plug-ins, but purchasing these means paying twice for the software. Every upgrade since version 3 has added important new features, but only a few at a time. FileMaker 5 had a new marketing look, but it was basically the same program. I know many of us out there feel this way. Our only hope is that if enough of us politely complain, FileMaker will finally listen.

You've Got Mail, Andy

ROGER BARTHELSON

I was a little surprised that Andy Ihnatko didn't mention Nisus Email in "E-mail Options Aplenty" (*Ihnatko*, August 2002). I don't use it as my main e-mail application, but I find it pretty useful if I want to send a clipping from another application. I find it invaluable if I need to send out several e-mail messages to a list of recipients and want to use a database to customize the messages (for example, when

I'm sending a general cover letter to a number of prospective employers but want to use the information in a simple AppleWorks database to customize each letter). I was disappointed to find that AppleWorks 6 left out the ability to e-mail directly from within the program—thereby preventing me from contacting a number of employers at once. Nisus Email allows me to do that fairly easily.

TIM LAPIN

While I share Andy's complaint that no single package seems to "have it all," I would like to add one more package to his list: PowerMail. I have been using version 3.X and eagerly await the 4.X upgrade. PowerMail is perhaps the only e-mail app for which I am willing to spend money. I don't know if I would go back to amber-on-black command-line sessions, but I should point out that I chose PowerMail because it was the closest program to Claris Emailer I could find at the time. Like many Mac users who also care about how their e-mail is handled, I was saddened by the loss of Emailer and simply



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refused to use any of the free clients, as they are all horrid in some way. I will probably spend more money on the latest PowerMail, although I am intrigued by the upcoming Jaguar release of Apple's Mail program. In either case, it sure beats spending \$400 or so for Entourage.

Macworld's Familiar Quotations

JIM WIGLER

David Blatner's "Save XPress Styles" (*Secrets*, July 2002) misquotes Dorothy Parker. In the screenshot showing formatted XPress files, we see "Life is a sonnet, life is a song / A garden of extemporanea / And love is a thing that never goes wrong." The real quote is "Oh, life is a glorious cycle of song, / A medley of extemporanea; / And love is a thing that can never go wrong; / And I am Marie of Roumania."

Play Myth III for Me

MICHAEL R. BAGNALL

Regarding Brian Holbert's letter about Myth III ("Myth III? Not for Me," *Feedback*, August 2002): I am the head of MythDevelopers, a group of volunteer programmers and artists who are fanatic about the Myth game series. Two of our programmers were recently given permission by the game's owners to make changes to the Myth III code and support it in terms of improving game play and providing a better multiplayer environment. These changes are in development. We currently support online game play for Myth II: Soulblighter and will support Myth I by the end of summer. We plan to have a Myth III service ready sometime this fall. More information is available at PlayMyth.net.

Fax Attacks

JOSEPH SLATER

After reading your editor's note stating that you knew of no OS X-native alternative to Smith Micro's Faxtfx fax software ("Just the Fax," *Feedback*, August 2002), I went to VersionTracker.com and found that, indeed, Cocoa eFax is listed. Why wasn't Cocoa eFax included?

When we wrote our note—and the May 2002 review of fax software—Cocoa eFax was a beta release. It's our policy to review software only after a shipping version has been released.—Ed.

Film versus Digital

HARRISON JUDD

I object to the use of the term "film-camera quality" in your review of the Canon EOS D60 (*Reviews*, August 2002). Compare a JPEG file from any digital camera with a 35mm scan from even a 2,700-dpi scanner, and the scanned image is preferable, for resolution alone. And film can capture subtle shadows and difficult highlights that no current digital camera can. Digital cameras continue to evolve, but they simply don't match the quality of standard 35mm film in resolution or dynamic range of color fidelity. Digital-camera shutters are also much slower to respond than traditional SLRs. Your reviews are generally accurate and informative, but digital cameras are a long way from being able to boast film-camera quality, even at the high end of the equipment spectrum.

In Praise of InDesign

ADAM ROGERS

Amazing—after boldly exposing the quirks in QuarkXPress and giving some ink to InDesign, the new kid on the block, you run three letters, out of a total of four on the subject, in favor of XPress ("Layout Shoot-Out," *Feedback*, August 2002). I thought I'd never leave XPress, but since giving the InDesign trial version a test-drive in designing a 200-page publication, I've never looked back. At first I felt funny, but after leaving XPress for InDesign, I'm happier, more creative, and less dependent on aspirin. Sure, most printshops have yet to support it, but with InDesign I can create bullet-proof PDFs that rip straight to press. This is much easier than sending a Quark file and praying that all my tables and fonts will come out as I intend them to.

BRAD CATHEY

As ten-year veterans of QuarkXPress, we switched wholesale to InDesign after version 1.5 came out. We've been running it on everything from beige G3s to multi-processor G4s, printing on a variety of printers and sending files to printshops around the country without incident. Granted, InDesign doesn't do everything, but it does a lot more than QuarkXPress, especially in the area of productivity. What used to take an hour now takes 60 seconds.

GARY STOLZ

To Mr. Hall: My vendors support InDesign because I told them I'd be using it, and they want to keep me as a customer. One vendor in particular worked closely with me when InDesign 2.0 came out. We've had no troubles, from one-color solid to four-color process printing. To Mr. Shub: Conversion from QuarkXPress isn't perfect, but trust me, you want InDesign to reflow your text with its own type engines. To Ms. Jackson: You have no business putting a JPEG file into a print piece. Convert the file to TIFF in Photoshop before you resize the photo and apply the unsharp mask. The only place InDesign doesn't compete with QuarkXPress is in customer service—Quark's is still the rudest in the solar system.

Keller on Batteries

MARK TANK

Jeff Keller says that it's a bad thing Fuji doesn't have a rechargeable battery ("Keller on Cameras," *Reviews*, August 2002). There is a debate among digital photographers about this. I believe that not having a specific rechargeable battery is a good thing. A camera that uses AA batteries lets the user choose from hundreds of good-quality rechargeable AAs. If you leave your charger at home, you can buy AAs to get you by.

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CORRECTIONS

The correct Web address for 21st Century Media, the makers of cast:stream ("Macworld Conference & Expo Best of Show," *Mac Beat*, September 2002), is www.21stcenturymedia.com.

The chart accompanying "Power Mac: Twice As Nice" (*Mac Beat*, October 2002) listed the incorrect graphics processor for the dual-1GHz and dual-1.25GHz Power Macs. The video card in these models is ATI's Radeon 9000.



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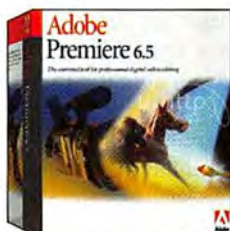
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PHOTOSHOP HAS BEEN OS X NATIVE SINCE SPRING—NOW PLUG-INS ARE FOLLOWING SUIT

The Plug-in Puzzle

>> For design professionals, switching to Mac OS X without a native version of Adobe Photoshop would be like buying a new car without an engine. The car's exterior may look nice, but it really won't take you where you want to go.

OS X-compatible Photoshop 7 has been available since April, but design pros haven't necessarily been driving happily into the sunset with Apple's new operating system. A native version of Photoshop fills a major gap for designers, but smaller, crucial pieces of the puzzle remain absent: OS X-savvy plug-ins.

Applications rely on plug-ins to add specific capabilities for niche users. Programs such as Photoshop, QuarkXPress, Adobe Illustrator, and FileMaker are already rich in features and hefty in file size; by

supplying features needed by a select segment of users, plug-ins keep those apps from bulking up further. You may not want to create 3-D broadcast-quality titles in Photoshop, but that may be just the functionality a digital-video pro needs to save hours of work.

OS X Unplugged

Photoshop has hundreds of plug-ins—probably thousands if you include freeware floating around the Internet—almost all of which were written before OS X. And if there's a particular Photoshop plug-in you're fond of using that isn't OS X compatible, you'll have to do your work in OS 9 or OS X's Classic mode.

If you're wondering about the demand for OS X-compatible plug-ins among Photoshop users, consider the case of Reindeer

Graphics. Shortly after Photoshop 7 was announced, the developer released three free plug-ins it had ported to OS X. Chris Russ, Reindeer Graphics' president, says that in the first week, the company saw 8,000 downloads per plug-in.

"This gave us an idea of the pent-up demand," says Russ, whose company has since released the OS X-native Optipix plug-in and is working on a native version of its Fovea Pro application that it hopes to release by year's end.

How successful have third-party developers been in porting existing plug-ins to OS X? Adobe doesn't have hard numbers, says Tom Ruark, who works in the company's Partner Technologies department and interacts with many plug-in creators. But Adobe believes that many developers are working on the conversion to OS X now.

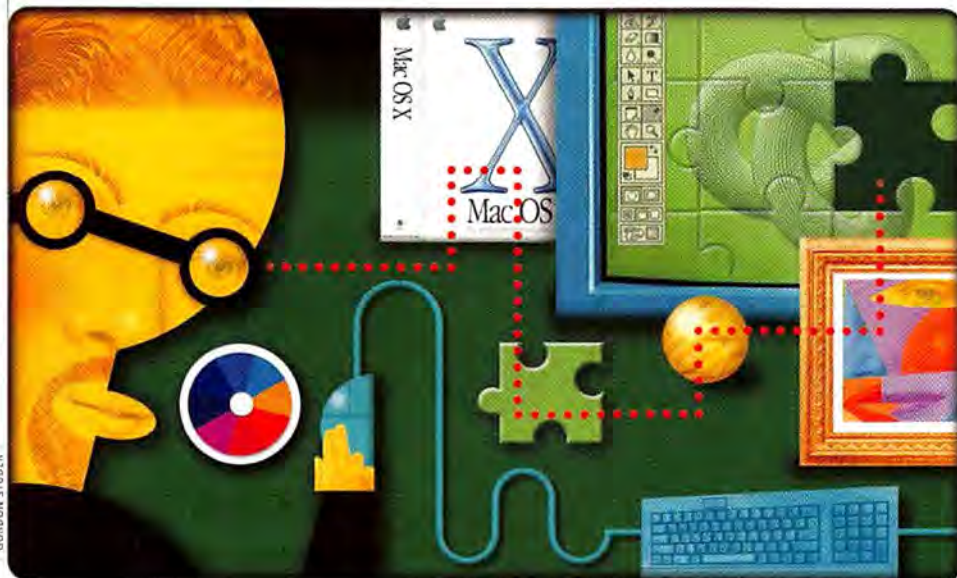
Head Start

Indeed, all the plug-in developers *Macworld* spoke to either have OS X-native versions available now or have them in the works. A handful of software makers were able to put out their products at the same time Adobe released Photoshop—or, in some cases, *before* Adobe released Photoshop.

The explanation for this space-time continuum sleight of hand? Many of the programs are Photoshop-compatible plug-ins that also happen to work with other applications. So developers were able to charge ahead with OS X

WHAT'S NEXT

Comdex isn't a big Mac event, but many of the cameras, printers, and storage devices the November 18 trade show will feature are aimed at Mac and Windows users alike.



versions even before Photoshop 7's release. "We were OS X native before Photoshop," says Mike Fotheringham, Auto FX's vice president of research and development. Mac users running OS X would launch Photoshop 6 in Classic, but if they activated an Auto FX plug-in such as DreamSuite, it launched as a separate application in OS X's Aqua interface.

Auto FX was ahead of the curve because the company was eager to take advantage of OS X's power. "We're processor and memory intensive, so we knew OS X would benefit us a lot," Fotheringham says.

Corel's Procreate division also released OS X plug-ins before Photoshop 7 arrived. Among those early releases were Photoshop-compatible plug-ins Knock-Out 2 and KPT Effects.

Greg Wood, Procreate's communications manager, says the company's schedule did pose a bit of a challenge, but "we worked with Adobe on prerelease versions of Photoshop." Procreate engineers were also able to learn from their first OS X release, the 3-D-landscaping and -animation tool Bryce. "We took what we'd learned from Bryce, and within a few days, we'd converted KPT Effects," Wood says.

Ready or Not?

While some native programs have been available for a while, others are still in development (see "Plug-in Away"). "For some plug-ins, it could be that customers aren't requesting OS X versions yet," Adobe's Ruark says. "It might also be companies' development cycles—they could be working on other projects and just haven't gotten to the conversions yet."

That's been the case at Andromeda Software, which has 14 Photoshop-compatible plug-ins. Engineers have converted two of them, ScatterLight Lenses and LensDoc Filters, to OS X.

The remaining products are on a waiting list. Product Manager Louann Barbeau says that competition for engineering time is the main cause. "We're trying to give the plug-ins the importance they deserve, yet still handle other demands on our engineering consultants," she says.

Overall, engineers haven't reported many problems during conversion,

Plug-in Away

Adobe Photoshop users can choose from among hundreds of plug-ins when they need to bolster the capabilities of the image-editing program. Here's a sampling of popular plug-ins that provide a wide array of capabilities—and the progress they're making toward Mac OS X compatibility.

COMPANY	PRODUCT	PRICE	CONTACT	WHAT IT DOES	MAC OS X COMPATIBILITY
Alien Skin Software	Eye Candy 4000	\$169	888/921-7546, www.alienskin.com	3-D bevels, drop shadows, and other effects	available now
	Image Doctor	\$129		image correction	available now
	Splat	\$99		frame, resurfacing, stamping	available now
	Xenofex 2	\$129		natural phenomena and distortion	end of 2002
Andromeda Software	Cutline Filter	\$74	805/547-0055, www.andromeda.com	hand-engraved special effects	no date announced
	ScatterLight Lenses	\$98		scattering highlights	available now
	Shadow Filter	\$109		3-D shadows	no date announced
	Three-D Filter	\$56		3-D visualization and scene creation	no date announced
Auto FX	VariFocus Filter	\$47		selective focus effects	no date announced
	AutoEye 2.0	\$129	205/980-0056, www.autofx.com	color and detail rebuilding	available now
	DreamSuite Series One	\$199		visual effects	available now
	DreamSuite Series Two	\$149		visual effects	available now
Extensis	Photo/Graphic Edges 5.0	\$199		edge effects	available now
	IntelliHance Pro	\$200	800/796-9798, www.extensis.com	image enhancement and color correction	early 2003
Human Software	Select Pro 4	\$249	408/399-0057, www.humansoftware.com	color correction	available now
	Textissimo 3	\$99		text effects	fall 2002
nik multi-media	Sharpen Pro	\$330	619/725-3150, www.nikmultimedia.com	image sharpening	available now
Procreate	KnockOut 2	\$329	800/772-6735, www.procreate.com	masking	available now
	KPT Effects	\$199		image transformation and other effects	available now
Reindeer Graphics	Fovea Pro	\$800	828/252-7515, www.reindeergraphics.com	image analysis	end of 2002
	Optipix 1.0	\$100		image enhancement	available now
XaosTools	Paint Alchemy	\$199	510/525-5465, www.xaostools.com	paint effects	no date announced
	TypeCaster	\$199		type conversion	no date announced

Ruark says. For his part, Auto FX's Fotheringham found the conversion process "amazingly smooth," with one notable advantage: "When I develop in OS X, I don't crash," he says.

Finley Lee, a software engineer at Alien Skin Software, also describes the process as "pretty simple and straightforward. The folks with problems have older code for their user interfaces."

Eye Candy 4000, Splat, and Image Doctor are among the Alien Skin plug-ins that already feature OS X compatibility. An OS X-native version of Xenofex will be available at year's end. "In some ways, doing an OS X version is like supporting a new platform," Lee says. "But

except for some little bugs, [the process has] been smooth. Apple did a fine job with Carbon. It's a pleasure to program for, compared to Classic."

The Last Word

Time will tell whether working in OS X will be as pleasurable for design pros as programming in it was for Lee. If you need specific Photoshop plug-ins to work efficiently, you'd be wise to check on the status of your favorites before switching to OS X. But for the lucky designers who rely on Photoshop *and* on core plug-ins that are already available in native versions, the OS X puzzle may finally be complete.—TERRI STONE

IMAGING
BEAT

Digital Cameras

Two cameras from Canon (800/652-2666, www.usa.canon.com): The **PowerShot S230 Digital Elph** (\$399) is a 3-megapixel camera with a 2× optical zoom lens—the first 3-megapixel Digital Elph camera. Designed for maximum portability, it replaces the PowerShot S200, now priced at \$299, at the top of the Digital Elph line. The **PowerShot G3** (\$799), which replaces the PowerShot G2, is a 4-megapixel camera with a fast f2.0–3.0, 4× optical zoom lens; new metering modes (including spot metering); and an improved connector for attaching add-on wide-angle and telephoto lenses. The G3 provides extensive flexibility for digital photographers, with 12 preset shooting modes and complete manual controls. Both the G3 and the S230 have improved movie modes, which are capable of recording as much as 3 minutes of video at 15 fps. They also sport a new imaging processor that Canon claims offers better image quality and faster overall processing. Each camera comes with a 16MB CompactFlash media card, a USB cable, and Canon's ImageBrowser app; they work with OS 9 and OS X.

Two **EasyShare** cameras, from Kodak (800/242-2424, www.kodak.com): The **DX4330** (\$350) is a 3-megapixel camera that features the debut of Kodak's 1.8-inch Indoor/Outdoor LCD display. It has a 10× zoom with a Kodak Retinar aspheric all-glass 3× optical zoom lens. The **CX4200** (\$180) is a 2-megapixel camera with a 2× digital zoom.

A digital-camera recall by Nikon (800/645-6687, www.nikonusa.com): A limited number of **Coolpix 2000** digital cameras have a battery-circuit problem that could cause excessive heat in the camera. As a result, Nikon has issued recall orders for all cameras with serial numbers between 3010001 and 3060980 and between 3510001 and 3561916. If you have an affected camera, call Nikon Customer Service at the provided number for detailed instructions on returning the camera.

Three cameras from Olympus (800/645-8160, www.olympusamerica.com): Similar in size to Canon's Digital Elph line, the **C-50 Zoom** (\$600) is a 5-megapixel camera with a 3× optical zoom. It uses the new xD-Picture card format jointly developed by Olympus and Fuji, and it comes with a 32MB xD card. The **C-5050 Zoom** (\$900) is a 5-megapixel camera with an f1.8, 3× zoom lens; magnesium body; hot-shoe for external flash; and support for xD, SmartMedia, and CompactFlash cards. It includes a 32MB xD card. The **C-730 Ultra Zoom** (\$700) is a 3.2-megapixel camera for people who want a telephoto lens. Its 10× optical zoom lens has the equivalent of a 38mm–380mm lens on a 35mm film camera.

Projectors

A projector from Sharp Electronics (888/467-4277, www.sharpelectronics.com): The **Notevision C50** projector (\$6,195) features 3,000 ANSI lumens of brightness and native XGA resolution. It operates at a sound level of 36 dB, and it offers S-Video and composite inputs and two separate RGB inputs. —COMPILED BY RICK LEPAGE AND PHILIP MICHAELS

APPLE'S .MAC STRATEGY COULD BE A SIGN OF THINGS TO COME ON THE WEB

Pay to Play—Here to Stay?

Some of us may disagree with Apple's decision to turn its iTools suite of free Web-based applications into the fee-based .Mac, but there's no denying an increasingly common trend on the Web these days: formerly free services appearing with a price tag attached.

Several factors are behind the Web's shift from free to fee; among them is the money needed to offset a Web site's operating expenses. "Right now, when you run a service on a Web server, you

One key difference between Apple and many other fee-based sites is the company's main business: personal computing. As other rivals look to fully integrate their software with the Internet, Apple has to keep up. "Apple probably needs to extend its reach to servers and the Internet if they want to compete against Microsoft as a platform vendor," Travers said. "More and more people see the network as an extension of their computer, so it would probably be very risky for

Apple not to do something like this."

Consider the Costs

But will that risk pay off? Right after Apple announced .Mac in July, disgruntled iTools users flocked to message boards, circulated petitions, and sought out free alternatives for e-mail and online storage. Using no-cost Web services is certainly easier on the budget and lets users create multiple accounts for handling



Farewell to Free Some Mac users may balk at paying for .Mac, but free online services are rapidly disappearing.

bear all the costs in hardware, software, and bandwidth," says Oliver Travers, a marketing consultant and editor at The End of the Free (www.theendoffree.com), a Web site that tracks the emergence of fee-based services on the Web. "The more your free service grows, the more you lose money."

Changing Times, Shifting Strategies

Although swallowing all the administrative costs may have been the thing to do a few years ago, leaner economic times have forced many Web sites to review their free offerings and look for ways to offset expenses. While some sites known for free Web tools—notably, Yahoo and MSN Hotmail—have gone with a mix of free and premium services, others—such as mail-forwarding service Mail.com and search engine Northern Light—have done what Apple did with .Mac and begun charging consumers for access to their services.

both personal and professional business online. But there can be drawbacks to relying on such services.

Complaints about free e-mail services deleting old mail or being difficult to access aren't new, but with more companies pushing users toward premium fee-based services, restrictions on what a free e-mail account can and can't do are likely to grow tighter. Then there's the lack of accountability if a business offering free services goes belly-up. This summer, TalkCity, a free Web-site-hosting company, abruptly shut down its servers as its bankruptcy proceedings began—making it impossible for the people who had created the 2.5 million Web pages hosted there to retrieve their files. As of press time, TalkCity's company officers said there were no plans to revive the servers. The bottom line is that users currently have little legal recourse when they lose their files or e-mail. And that's a cost to consider, even when the services are advertised as free. —LISA SCHMEISER

Low-Budget Blockbuster

When it came out seven years ago, Sony's VX1000 MiniDV camera changed independent film production by offering high-quality digital video at an impossibly low price. Now, it's Panasonic's turn to revolutionize digital cinema, with its AG-DVX100 camcorder (800/528-8601, www.panasonic.com)—the first video camera to boast true cinema-style, 24-fps progressive video capture. This frame rate helps the AG-DVX100 produce video that's more film-like than the output of traditional camcorders that capture images at 30 fps. In addition, the AG-DVX100 can easily switch between 24-frame progressive, 30-frame progressive, and 60-field interlaced (normal video) capture modes. The 4.4-pound camera comes with several touches aimed to please video pros: a precision lens with manual zoom, focus, and iris controls, and two built-in XLR audio inputs. Those capabilities and features come in a camera priced at \$3,495—a fraction of what the AJ-PD900WA (\$40,000), the AG-DVX100's high-end older sibling, costs. Panasonic figures that the AG-DVX100 will appeal to Mac-using filmmakers, and not just because of the camera's FireWire interface—Apple has already publicly committed to native support of Panasonic's new 24-frame mode in future versions of Final Cut Pro.—ANTON LINECKER



MACS AT WORK

Small Megahertz, Big Output

Pick up any full-color glossy magazine from the newsstand, and chances are it was put together by an army of computers running off enough processing power to light up a city block—but not *Delaware Beach Life*. Four times a year, editor and publisher Terry Plowman assembles his 100-page magazine on an iMac whose G3 chip boasts a clock speed that hasn't been considered fast since the Clinton administration.

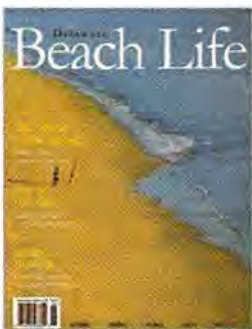
Nevertheless, Plowman has published four issues of *Delaware Beach Life* since the magazine's June 2002 debut, using nothing more than a 400MHz G3 iMac with 192MB of RAM and Mac OS 9. Not that Plowman is complaining: "When the iMac came out, it seemed like a perfect model for my home office," he says. "I like that it's self-contained, and it fit my budget of about \$1,500. I considered buying a more powerful Mac, but I was unsure about ad revenues with a start-up, so I decided to give this model a try."

The mighty but modest iMac tackles every task at the magazine, from page

layout to subscription management. And while the graphics programs can test its processing limits, the machine holds its own with demanding applications such as QuarkXPress and Adobe Acrobat and Photoshop.

The quality of the full-color glossy magazine is so convincing that even the printers don't know the difference. "They're none the wiser," Plowman says. "Every month, they receive perfectly crafted PDFs, which they use to print the magazine. They're delighted I'm on a Mac, since most publications they work with are done on the Mac platform."

Although Plowman will soon add an 800MHz G4 iMac with a 17-inch flat-panel display to meet the growing magazine's needs, his three-year-old iMac won't be forced into retirement. Plowman plans to use the original machine to handle subscriptions, accounting, and e-mail. One thing is for certain, however. "I'm too familiar with Macs to even consider a PC," he says. "[It] just strikes me as an inelegant version of a Mac."—LISA BAGGERMAN



PRODUCTIVITY BEAT

Software

Utilities

DragStrip 4.0, from Aladdin Systems (800/732-8881, www.aladdinsys.com): The launcher application, which lets users organize and access frequently used files and applications, adds OS X support. It also includes a new Strip assistant for customizing strips (\$20; upgrade, free).

Speech Recognition

iListen 1.5, from MacSpeech (603/626-5111, www.macspeech.com): The update to the speech-recognition program runs in both OS 9 and OS X. It features improved recognition performance, transcription support, and voice playback in correction mode. It also adds shared preferences between OS 9 and OS X, as well as an iListen Dock menu for OS X (\$99; upgrade, \$40, or free for people who purchased iListen after June 1, 2002).

Word Processing

Documents To Go 5.0, from DataViz (800/733-0030, www.dataviz.com): The productivity app that lets you read and edit Word and Excel files on your Palm OS-based PDA is now OS X native. The premium edition includes the ability to create and edit word-processing and spreadsheet files on the handheld (premium, \$70; standard, \$50; upgrade pricing varies).—COMPILED BY PHILIP MICHAELS



INPUT DEVICE BEAT

Keyboards

Two corded keyboards and four cordless keyboard-mouse combinations from Logitech (800/231-7717, www.logitech.com): The **Internet Navigator Keyboard** (\$30) and **Elite Keyboard** (\$50) feature an integrated navigation tool that allows users to scroll, zoom, access hard-drive files, and browse Web bookmarks. The **Cordless Access Duo** (\$60) features a mouse and an Access keyboard with a zero-degree-tilt design, while the **Cordless Navigator Duo** (\$80) includes a Cordless Navigator keyboard and Cordless Optical Mouse. The **Cordless Comfort Duo** (\$100) bundles a keyboard and a Cordless MouseMan Optical, while the **Cordless Elite Duo** (\$100) pairs Logitech's Elite Keyboard with the Cordless MouseMan Optical.

Mice

A wireless mouse for presentations, from Powr Marketing (866/800-7697, www.powrmarketing.com): The **Powr Pointer** (\$100) is a fully functional mouse with a laser pointer that uses a 900MHz RF signal to connect to a Mac as far as 30 feet away. It comes with a USB receiver that plugs into the computer.—COMPILED BY PHILIP MICHAELS

MICROSOFT TO MAC USERS: WHERE DO YOU WANT TO GO NEXT YEAR?

MSN Coming to Mac in 2003

Starting next year, Mac users looking for online services, such as e-mailing, calendaring, and instant messaging, will have another option to consider—and it will be from a source long off-limits to the Mac platform.

Microsoft (800/426-9400, www.microsoft.com) plans to release a Mac client of its MSN online services in early 2003. In keeping with Microsoft's pledge to focus all Mac development on Apple's new operating system, the Mac MSN client will be available only for Mac OS X. The move comes as other Internet service providers spruce up their Mac offerings—particularly America Online, with its release in August of an OS X-only client for its AOL service.

"We saw a need," says Tim McDonough, director of marketing for the Microsoft Mac Business Unit, which will work with MSN to develop the client software. To that end, the Mac Business Unit will draw on its experience in developing Internet Explorer and Entourage specifically for the Mac. Look for core technologies from those applications to be integrated into MSN's Mac client, which will be built from the ground up in OS X. Microsoft also plans to provide free Mac-specific customer support when the MSN for Mac client ships in early 2003.

Monthly subscription prices vary, depending on how you receive MSN services. Dial-up service costs \$22 a month, while broadband service is available for a \$40 a month.—PHILIP MICHAELS

SILICONE-CAST KEYBOARD FLEXES ITS MUSCLE

Bend, Don't Break

If superheroes ever find themselves in need of a keyboard, they'd do well to consider the CoolMac Keyboard from CoolMacStuff.com, the online store for the Mac specialist Crywolf Consulting (866/266-5622, www.crywolfstore.com/cool), in San Diego. Like the Man of Steel himself, the CoolMac Keyboard is nearly impervious to whatever hazards life can throw at it. Crumbs, stray ink marks, beverage spills—the kind of mishaps that can fella an ordinary keyboard—roll

off the CoolMac Keyboard's silicone-cast body without a fuss. Crywolf drew on a similar PC product for inspiration, but it added enough Mac-specific touches—such

as the ⌘ keys on either side of the spacebar—to make its \$59 keyboard appeal to Mac users. (Look for a keypad-equipped version and one for PDAs sometime this fall.) Flexible enough to roll up into a bundle, the CoolMac Keyboard is ideal for travelers who demand portability but don't want to sacrifice durability. Its flat design also eliminates negative-angle wrist stress. Like any superhero, the CoolMac Keyboard has one vulnerability—don't slice through the silicone with a knife or a pair of scissors and expect it to remain functional. There's no word yet on how well the keyboard withstands kryptonite.—PHILIP MICHAELS



PRO FILE | Q&A WITH DAVID STORY

MONEY TALKS

Intuit caused a stir among Mac users this summer when it announced plans to release a new version of QuickBooks, the long-dormant small-business finance program that hadn't been updated in four years. As Intuit prepares to ship the OS 9- and OS X-compatible update in early 2003, *Macworld* speaks with David Story, chief technology officer for Intuit's small-business and personal-finance division, about the decision to revive QuickBooks.—PHILIP MICHAELS



AT A GLANCE

DAVID STORY

CTO, Intuit's small-business and personal-finance division

MAC: PowerBook G4 **SOFTWARE:** Photoshop Elements, Microsoft Word

Why is Intuit putting out a new Mac version of QuickBooks?

In looking at QuickBooks and its history, the key thing about our decision to bring it back has just been listening to customers. A lot of people don't know that we survey thousands of customers every year. And recently, we've seen an uptick in interest in the re-release of a version. They really wanted us to do a version that worked with OS X, and they wanted to see an ongoing commitment to the platform. That's what we're talking about here—a long-term commitment, a multiple-year commitment to develop QuickBooks for the Macintosh.

Why did development of the Mac version stop?

The essential reason was that we knew we could continue to offer support for QuickBooks for the Mac. We'd been looking at other products and saying, "We can go to not-annual releases of these." And when we looked at customer demand, they were pretty satisfied with that product. That product has just outsold everything else. It's been a fantastic product for us. So what we decided to do was keep very active and keep track of what new things customers wanted. When that hit critical mass, we decided to reinstitute our Macintosh business and set up a separate Macintosh business specifically focused on that to make sure we were able to take advantage of OS X and meet a backlog of customer needs.

So you wouldn't say that the perception among some Mac users that QuickBooks abandoned the Mac is accurate?

If you look at it from Intuit's perspective as a whole company, we've continued to release TurboTax and Quicken and really be dedicated to the Mac platform. It was simply on the QuickBooks side [that] customer demand was appropriate to keep the current version running. So that's why we focused on maintenance releases and patches and updates for QuickBooks, and now it's time to come back and really focus in on [a new version].

More Info:

www.macworld.com/2002/11/macbeat/quickbooks.html

Intuit explains how QuickBooks fits into its Right for My Business strategy in *Macworld's* online interview.



Is your digital camera giving you the most realistic images?

With up to 10x optical zoom, the Olympus C-720 and C-730 Ultra Zoom cameras create picture quality so real, your images come to life. Faraway subjects are brought in close for detailed pictures, even in 8 x 10 prints. Combine this with 3 megapixels and an advanced Color Management System for accurate colors, plus a lens designed specifically for digital photography, and the result is crisper, more realistic images.



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megapixels
and 10x
optical zoom.*

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The missing piece of the Mac OS X puzzle



Introducing Drive 10 version 1.1. Optimizes and defragments your Mac OS X drives and much more.

For Apple's next-generation operating system, you'll need a next-generation disk utility. That's why Micromat has introduced Drive 10, the first and final disk utility for Mac OS X. Problems with your drive? Drive 10 can repair almost any drive problem with one simple click of your mouse. All within Mac OS X's native environment.


And with the introduction of version 1.1, you can now optimize and defragment your Mac OS X drive from within Mac OS X. Plus, we've added a whole host of new repair routines that allows you to find and correct drives problems that other utilities would simply abandon.

Drive 10 is a world-class diagnostic and repair utility. Using time-tested routines developed exclusively for Mac OS X, Drive 10 offers many tools for checking and repairing any drive on your system. The included Drive 10 CD-ROM will boot your machine to repair hard drives that won't even appear on the desktop.

Don't entrust your Mac OS X drive to ancient and outdated utilities. Protect your data and drive safely with Drive 10.



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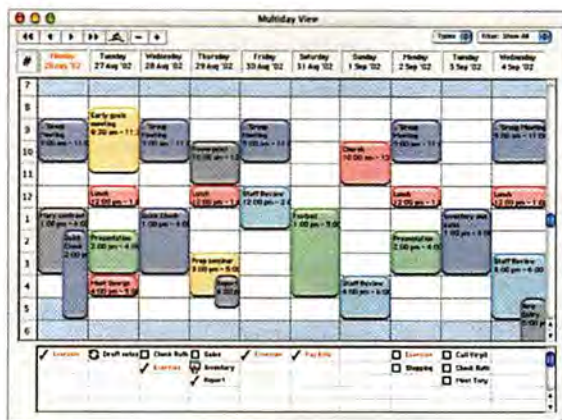
A New Day for Developers?

Apple's i-apps have gone a long way toward justifying the price Mac users pay for their machines. After all, free applications such as iMovie, iTunes, and iPhoto transform Macs from mere computer terminals into management centers for digital devices. The September releases of iCal and iSync figure to further extend those capabilities by providing users with a calendaring application and a way to coordinate information across all their digital devices.

such a good deal for Mac developers. Just as makers of MP3-playing, CD-burning, and DVD-authoring products had to contend with the release of iTunes and iDVD last year (see "Toasting the Competition," *Buzz*, June 2001), iCal could mean increased competition for established calendaring programs—such as Power On Software's Now Up-to-Date & Contact and Chronos's Personal Organizer and Group Organizer—not to mention a slew of shareware and free-ware options (see "Daily Reminders").

"This is not really a new situation in the personal-information-manager market," says Robert McCullough, Chronos's vice president of product development. "The Palm Desktop software is also free and has been for several years. The reason that Personal Organizer continues to sell well is that it offers many features that just aren't available in the Palm software—or in iCal."

Apple declined to comment on the effect that free



One Day at a Time iCal's release means more competition for established programs, such as Chronos's Organizer (pictured here).

"We wanted to centralize the movement and syncing of data," says Christian Thomas, product manager for iCal and iSync. "One application manages all of your PIM data." Indeed, by harnessing the Bluetooth wireless-connectivity standard, iCal will let you synchronize the calendar on your computer with a Palm handheld, a cell phone, and even an iPod, publishing the calendar, live, to the Web (provided that you subscribe to Apple's .Mac services).

But while the price of free i-apps may be right for Mac users, it's not always

programs such as iCal might have on its relationship with developers. As for the developers themselves, McCullough says that he supports Apple's drive to increase market share through the i-apps, but notes that the company is walking a fine line.

"We at Chronos have been developing Macintosh software since 1993," he says. "We stuck with the platform through the lean years because we like Macs and we like developing for them. However, it's not easy to compete with companies like Microsoft, Palm, and now Apple."—MATHEW HONAN

Daily Reminders

COMPANY	PRODUCT	PRICE	CONTACT
Apple	iCal	free	800/692-7753, www.apple.com
Chronos	Personal Organizer	\$60	435/615-7335, www.chronosnet.com
	Group Organizer	\$100	435/615-7335, www.chronosnet.com
Microsoft	Entourage	\$499*	800/426-9400, www.microsoft.com
Palm	Palm Desktop	free	800/881-7256, www.palm.com
Power On Software	Now Up-to-Date & Contact	\$119	800/344-9160, www.poweronsoftware.com

* Sold as part of Microsoft Office.



HARDWARE BEAT

Printers

Four printers from Epson (800/873-7766, www.epson.com): The **Stylus Photo 925** (\$299) and **Stylus Photo 825** (\$199) are six-color photo printers with built-in Flash media readers. The four-color **Stylus C82** (\$149) offers new Dura-Brite water- and fade-resistant inks and prints as many as 22 black-and-white and 11 color pages per minute. The **Stylus C62** (\$99) prints as many as 14 black-and-white and 10 color pages per minute. The Photo 925, Photo 825, and Stylus C62 all offer a maximum resolution of 5,760 by 720 dpi. The Stylus C82 offers a maximum resolution of 5,760 by 1,440 dpi.

Three four-color photo printers from Canon (800/385-2155, www.usa.canon.com): The **i320** (\$79) prints as many as 10 black-and-white and six color pages per minute with a maximum resolution of 2,400 by 1,200 dpi. The **i550** (\$149) prints as many as 18 black-and-white and 11 color pages per minute, while the **i850** (\$199) prints as many as 22 black-and-white and 14 color pages per minute. Those two printers have a maximum resolution of 4,800 by 1,200 dpi.

A monochrome laser printer from Xerox (800/835-6100, www.xerox.com): The **Phaser 4400** (\$999) offers a resolution of 1,200 by 1,200 dpi and prints as many as 26 pages per minute.—COMPILED BY KELLY LUNSFORD



NETWORKING BEAT

Software

LANSurveyor 7.0, from Neon Software (800/334-6366, www.neon.com): The network-management software now runs in OS X and the classic Mac OS. It features Backup Profiler, for determining data security on Mac and Windows machines, and new map topologies; it includes 20 Neon Responders for Mac OS and Windows (\$495; upgrade, \$129, or free if the program was bought after July 1, 2002).

Hardware

A wireless broadband router from D-Link (800/326-1688, www.dlink.com): The **D-Link AirPro DI-764 Dual Band Wireless Broadband Router** (\$499) features a built-in 4-port 10/100 Fast Ethernet switch and advanced firewall functionality. It simultaneously serves IEEE 802.11a wireless connectivity at 54 Mbps, IEEE 802.11b wireless connectivity at 11 Mbps, and enhanced IEEE 802.11b connectivity at 22 Mbps.

An electrical-wiring-Ethernet bridge from PhonexBroadband (800/437-0101, www.phonex.com): The HomePlug 1.0-compliant **NeverWire 14 QX-201** device (\$129 per node) takes unused bandwidth in standard electrical wiring to create a 14MB Ethernet network.—COMPILED BY JILL ROTER

WHAT'S
HOTA Quick Look at
the World of Macs

1. Apple's newest Power Mac G4s are now shipping. The revamped machines ship with dual optical-drive bays, allowing users to not steal music faster than ever before.
2. Mac users packed Apple Stores across the country on August 23, for midnight Jaguar release. Thankfully, trained handlers kept maulings to a minimum.
3. Intuit will update its Mac version of QuickBooks for the first time since 1998. Intuit executives say the move is the result of pent-up consumer demand and the sudden realization that the Mac platform wasn't a figment of someone's imagination.
4. Microsoft plans to release an OS X-compatible version of its MSN online service. System requirements for the MSN client include a small, low-cost PC that runs alongside your Mac.

Mac OS X Updates

powered by
versiontracker
.com

4D 6.8.2

Relational-database system

Address Office 3.0

Address book and PIM for small-office and home-office users

Apple iPod Updater 1.2

Restore and update features for OS X

Barcode Toolbox 2.0.2

Adobe Acrobat and Illustrator plug-in for bar codes

BIAS Peak 3.1

Adds QuickTime 6 support for audio-editing and -mastering application

ClearDock 1.1

Changes Dock background color in OS X 10.2

Cocoa Fortune 1.3

Port of Unix utility Fortune

Dantz Retrospect client 5.0.536

OS X 10.2 client for the backup software

Discus 2.65

CD/DVD-labeling software

Font Pilot 1.0

Font manager and previewer

Game Ranger 3.0

Online service for playing and discussing network games

Granite 1.0

Font-previewing utility

InstallAnywhere Standard Edition 5.0.4

Deployment solution and installer

Intego NetBarrier X 10.0.4

OS X 10.2 compatibility for software firewall

InterView X 2.2.2

USB video-in capture product

iTunes Publisher 2.0

Exports iTunes playlists to various formats

Lexmark Z22/Z32 Color Jetprinter 2.0.5

Printer driver

PageSentry 4.1.1

Net serving, monitoring, and failure recovery

PageSpinner 4.1

Web-authoring tool adds Quartz Text Smoothing, Jaguar support

Prosoft NetWare Client 1.0.2

OS X connectivity for Novell networks

Return to Castle Wolfenstein 1.3.3

First-person shooter game beta

SilverFast Ai 6.0.1

Scanner software for most scanners

Slick Transitions & Effects 4

iMovie 2 plug-ins

Spider-Man 1.0.2

Improved audio for action game

Tri-Backup 3.12

Automatic backup and synchronization utility

USB Overdrive X 10.0.0b5

Universal USB mouse or trackball driver for OS X 10.2

For these and other current updates, visit Macworld.com.www.macworld.com/subject/updates has the latest from VersionTracker.com.

HAIRSTYLE SIMULATOR LETS YOU TRY OUT A NEW 'DO

Hair-Raising Application

The realization that purple hair looked terrible with your complexion used to be immediately followed by the realization that your first realization had come too late. With Change My Image, a hairstyle-simulation program from Japan's Infinisys (www.infinisys.co.jp/), attacks of postmakeover remorse may be avoidable. The \$15 program (which runs on Mac OS 8.6 and later, including OS X) lets you virtually try on different styles—more than 100 of them—and colors. Just load a photograph into the program, choose a hairstyle, and line up both the photo and the hairstyle image. Then, using a color wheel with a brightness slider, you pick a color—everything from tangerine to aqua. But be warned: although Change My Image's color wheel contains all the hues of the rainbow, a lovely dishwater blond is difficult to approximate. The outlandish colors and a "cell-phone size" image-export option are clues as to this program's target audience: appearance-obsessed teenagers (and adults who think like them), rather than hair-care professionals. Even so, hair grows only about half an inch per month, and that \$15 might be money well spent if you're able to convince your teenager (or yourself) before it's too late that purple hair is hard to accessorize.—CHARLES PURDY



How Do I Look? Start with a picture (left); then preview a new you.

STORAGE
BEAT

Hardware

External Drives

An external Zip drive from Iomega (888/446-6342, www.iomega.com): The **Zip 750MB Drive** comes with a FireWire interface (\$200); a USB 2.0 version (\$179) is also available. The drive will read and write to the new 750MB Zip disks (available for \$15) and older 250MB Zip disks. The new drives can read 100MB Zip disks.

Media Readers

A flash media storage reader from Addonics Technologies (408/433-3899, www.addonics.com): The **Pocket Ultra DigiDrive** can read PC Card hard drives, ATA Flash cards, and CompactFlash I and II cards. An optional four-in-one Digi Adapter also supports Smart Media, Memory Stick, Secure Digital Card, MultiMedia Card, and MicroDrive. The DigiDrive comes with either a FireWire (\$119) or a USB 2.0 (\$89) interface. The version bundled with the DigiAdapter is also available for FireWire (\$179) and USB 2.0 (\$149).

Software

RAID Toolbox for Mac OS X, from CharisMac Engineering (530/885-4420, www.charismac.com): The RAID tool and single formatter has been rewritten from the ground up in OS X (\$100; upgrade, \$40).—COMPILED BY JAMES GALBRAITH

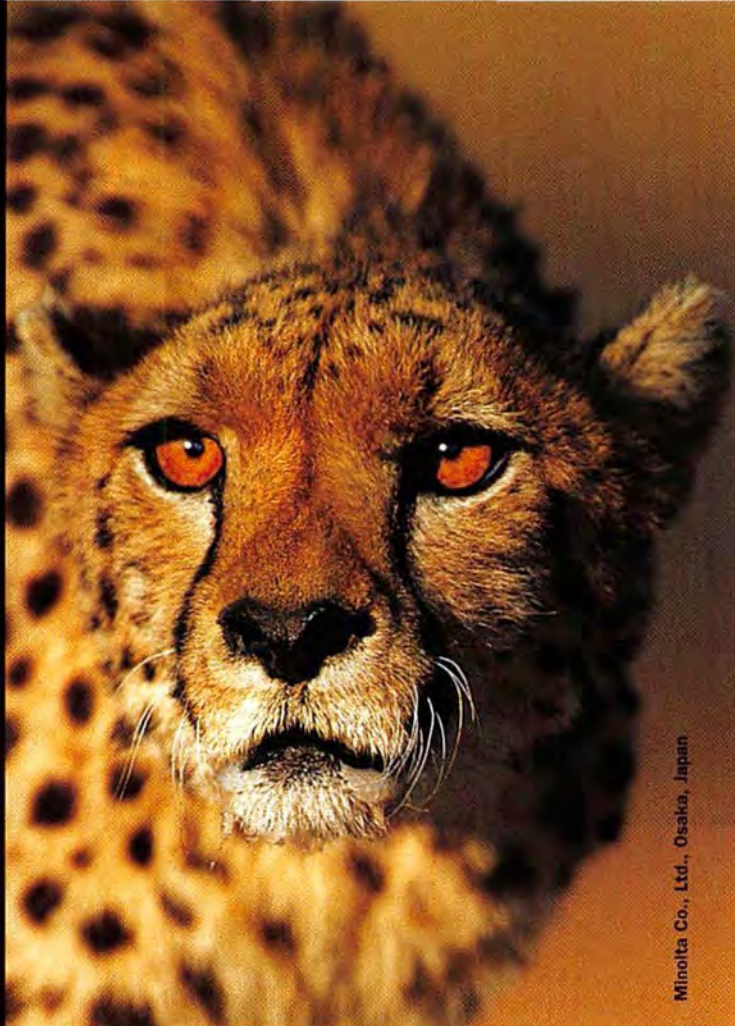
EDUCATION
BEAT

Science and Math Software

Matlab 6.5, from The Mathworks (508/647-7000, www.themathworks.com): The technical computing program adds OS X support and includes the new JIT-Accelerator technology for increased computational speed. Version 6.5 also includes new programming and development features, an enhanced interface, and improved Web integration (\$1,900). Also, **Simulink 5** (\$2,800), for modeling, simulation, and dynamic-systems analysis, is OS X compatible. New features include multidomain modeling for mechanical, electrical-power, and wireless systems; production code generation for microcontrollers; and major improvements in DSP code generation.

A New Kind of Science Explorer, from Wolfram Research (800/965-3726, www.wolfram.com): The companion software to *A New Kind of Science*, by Stephen Wolfram, lets you replicate the book's simple computer-program experiments, which explore areas including physics, mathematics, computer science, and biology. The more than 450 experiments offer an array of inputs and parameters, and they require no programming. The program runs in OS 8.6, OS 9, and OS X's Classic mode, and it should ship by the time you read this (\$65).—COMPILED BY JILL ROTER

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REVIEWS

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APPLE XSERVE

Server Provides Impressive Processing Power and Smooth Looks but Lacks Good RAID Implementation

BY SEAN GREATHOUSE

The Mac OS is now OS X; OS X is Unix; and Unix is the fastest, stablest server platform around. With Mac OS X Server, Apple has made the benefits of a Unix server OS available via point and click. The only thing missing from this picture has been true server hardware on which to properly run this operating system—until Xserve. We gave the \$3,999, dual-1GHz Xserve configuration a working-over and found that, while it lacks redundancy and has some design flaws, the advantages of so much G4 power in such a compact machine may make it worth your while.

Is the Xserve for You?

The Xserve is for anyone who wants to fit a lot of Mac in a little rack space—from small shops that want one powerful server tucked away in a phone closet, to video-effects houses that would benefit from putting 40 Xserves in a single cabinet. Depending on the configuration you choose, the Xserve packs as many as two 1GHz G4 processors, as much as 2GB of RAM, and as many as four 60GB or 120GB hard drives in an industry-standard 1U rack case (1.75 inches of vertical server-rack space—so you can fit more than 40 Xserves in a six-foot-tall rack).

The Xserve can also serve as a workstation in environments where equipment is often rack mounted, but keep in mind that the two 5,000-rpm blowers that cool the internal components make the Xserve much noisier than a G4 tower. Also note that it's intended only for rack mounting: at 19 inches wide and 28 inches deep, it uses too much real estate on a counter or desk, and it's not designed to support monitors or other components set on top of its case.

Out of the Box

Don't be fooled by Apple's photos of the slender Xserve, which are taken from the front of the unit. Viewed from above, it looks huge; its slight height is possible thanks to its generous 28-inch depth. The 26-pound Xserve's dimensions are standard for a 1U server but still surprising the first time you see the unit.

The Xserve's finish is similar to that of the Titanium PowerBook G4, with a solid look-and-feel. The case is rigid, so you can handle the server without twisting (and possibly unseating) cards and other internal components.

The back of the server features two FireWire, two USB, and two 10BaseT/100BaseT/1000BaseT (Gigabit) Ethernet

ports, as well as a single video port. The power connection has a clever retainer clip designed to spare you the shame of a sudden inadvertent shutdown. The final touch is standard fare for Unix servers but new to the Mac: a console-redirection port that gives you command-line access over a serial cable.

Beneath a slim CD-ROM drive, four removable drive bays dominate the front panel. Pressing on the front of a drive bay causes it to pop open, spinning down the drive and revealing a handle with which to pull the module out. Lights indicating Ethernet link, processor activity, and drive status provide both valuable information and tech-gizmo appeal. An additional front-panel FireWire port gives the digital-media crowd a place to plug in without hiking to the back of the rack.

The system-identifier button is a brilliant feature for anyone with multiple Xserves in a stack. Pressing this button turns on amber LEDs on the front and back of the case, allowing you to tag a server from the front and then easily find it again from the back.

A twist of a key activates the locking system that prevents the case from being opened, secures the drive modules, and disables the CD-ROM drive. If a FireWire hard drive was mounted before the system was locked, it remains mounted while newly attached devices are ignored. Likewise, USB connections to an uninterruptible power supply remain, but key-

board and mouse connections are blocked. Unfortunately, the key is only an Allen wrench with a fancy knurled handle—the standard locked-door approach to physical security is still your best bet.

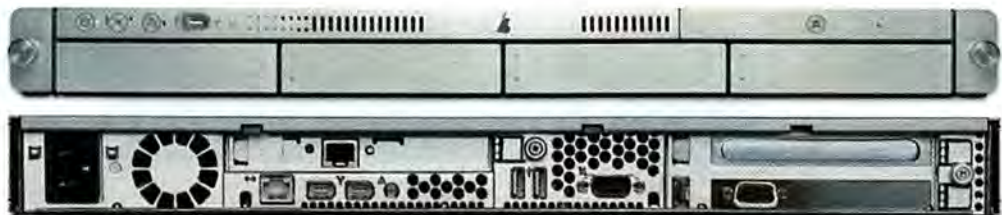
Into the Rack

The Xserve comes with hardware and instructions for mounting in four-post and two-post racks. In a two-post installation, it can't be mounted flush against the front of the rack, so it must extend both in front of and behind the rack posts. The top and sides of the case form a light shell that you can slide off the server and mount in the rack. You then slide the server into the secured shell and lock it in with two thumbscrews. Mounting the 26-pound Xserve is a two-person job, and its flexible shell doesn't properly prevent it from falling through the bottom until it is halfway in the shell. Furthermore, we recommend that you remove the Xserve completely from the rack to service internal components.

While mounting our test unit, we discovered a serious design flaw. When you're handling or working around the Xserve, it's very easy to bump the front of a drive bay, popping the handle out and disabling the hard drive. If you do this to the boot disk on a running Xserve, you get an instant system crash and possible data loss. The system lock doesn't currently prevent this, but Apple is working on solving the problem.

Uptime Is Everything

If your desktop is down for an hour, you lose an hour of work. But if a server is offline for an hour, your entire company loses an hour of work. To provide maximum uptime, servers use monitoring and redundancy—the Xserve excels at the former and all but omits the latter.



The Apple Xserve Shown here is the Xserve's front (top) and back (bottom). Its slight height belies its 28-inch depth.

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Slick Transitions and Effects Volume 4

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pop-pop, Medal of Honor: Allied Assault, Beach Head 2002, Clive Barker's Undying

OUTSTANDING: ★★★★★ VERY GOOD: ★★★★ GOOD: ★★★ FLAWED: ★★ UNACCEPTABLE: ★

By sensing and reporting hardware status, a server can warn a network administrator of potential problems, and the Xserve is full of sensors. It knows whether (and how fast) the fans are running. It knows how much power it's using and how hot it is. It takes advantage of diagnostic chips on the hard drives to predict drive failures, and it monitors its network-connection status.

All of this vital information is reported via the well-designed Server Monitor, a remote-management application that works only with the Xserve. Server Monitor can be set up to notify you of problems via e-mail, so warnings will also reach your e-mail-enabled cell phone or pager. Remote management is enabled via an extensive suite of graphical, command-line, and SNMP remote-management tools. In addition, if you can't respond to a temperature warning, the Xserve should shut itself off before overheating causes it to fail.

Unfortunately, the Xserve lacks redundant fans or power supplies, and it lets you create redundant hard drives only via the feature-poor and unreliable software-RAID implementation included in Apple's Disk Utility. When we tested our Xserve with two 60GB drives formatted as a mirrored array, Disk Utility didn't let us mirror a drive on which we already had data, forcing us to erase all drives in the RAID set and start over. (Our advice is to decide on your setup *before* you begin to configure your server.)

When we removed a drive canister to simulate a failure, the Xserve ran without interruption, although it failed to alert us that a drive had been removed or that the RAID set was broken. We also experienced serious difficulty in rebuilding the mirrored drive. As

with any system you rely on in a crisis, you should test failure and recovery behavior yourself, before the server is in production. For now, if you need the data-loss insurance provided by redundant hard drives, we recommend that you use an external hardware RAID.

If a component does fail, the Xserve can be quickly serviced with the optional spare-parts kit, but at \$1,549 to \$2,509, it's best suited for installations with multiple Xserves. Apple also offers AppleCare Premium Support for both the Xserve hardware and your OS X Server software, at \$950 for three years of around-the-clock phone and e-mail support with 4-hour or next-day on-site service.

Macworld's Buying Advice

The Xserve packs intense G4 processing power in a small form factor, so if your setup demands server-side processing, the Xserve is for you. As a storage server, the Xserve delivers mixed results. With as much as 480GB of drive space, there's plenty of capacity, but the current lack of reliable on-board RAID limits the Xserve's use to applications where uptime and data-loss protection aren't of primary importance, or environments that utilize external redundant storage. □

RATING: ★★★★★

PROS: Excellent status-reporting and remote-management tools; huge storage capacity; rack-dense design puts enormous power in a small space.

CONS: Lack of hardware RAID and decent software RAID limits use for some applications; insecure drive-bay latches can bring your server down.

PRICE: 1GHz and 256MB RAM, \$2,999; dual-1GHz and 512MB RAM, \$3,999

OS COMPATIBILITY: Mac OS X

COMPANY: Apple Computer, 800/538-9696, www.apple.com

FILEMAKER PRO 6

Database Software Enhances Ease of Use and Adds XML Support—without Rocking the Boat

BY SCOTT LOVE

If you're a Mac user, chances are you're well acquainted with FileMaker Pro. It has been part of the Mac's history since 1985, and version 6 retains the program's legendary ease of use. Users will appreciate what may likely prove to be this release's best feature: extending and constraining found sets. FileMaker Pro 6 also offers XML import and export capabilities; however, this version may leave you wanting more when it comes to security enhancements, multithreading, and innovation.

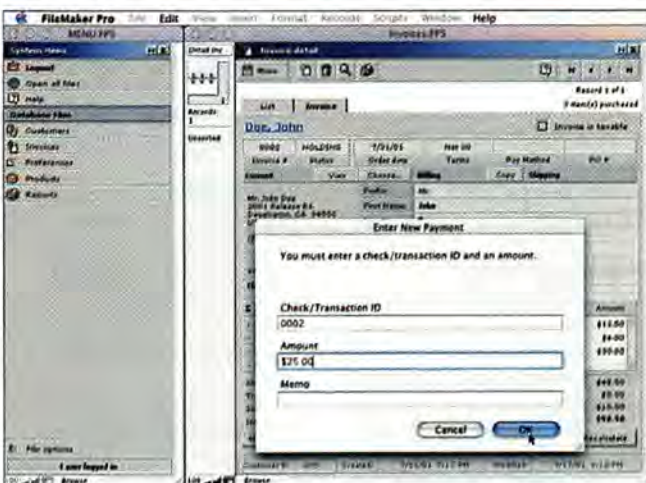
Day-to-Day Use

One of FileMaker's strengths is its ability to perform complex searches. In the past, though, it always replaced one found set with the results from the next. It's now possible in Find mode to refine a set of records further by performing subsequent requests with the Constrain Found Set

option, which lets you apply a second search to only those records within the current group. Likewise, Extend Found Set allows you to add records to the overall group. These functions are fully scriptable and should help you better manage data sets.

Another small but welcome change is that you no longer have to go through the Sort dialog box or create a script for basic sorting requests. Instead, you can pull up a contextual menu with a single click of the mouse and perform simple sorts on any field of a given layout.

When you need to make global changes, a new Find/Replace feature lets you search across fields and records and change data within them. You could, for example, universally change a misspelling of *San Francisco* wherever it occurred in your database. Developers will value this handy way to avoid writing



In the Driver's Seat FileMaker Pro 6's Custom Dialog boxes let developers create customized information requests and make sure that end users fulfill them.

some parsing functions, but be warned: the fields you wish to modify must be on the current layout for this function to be effective, and it applies only to a current found set.

Diving into Development

For developers, the big news is Custom Dialog boxes. While not as flexible as the popular Troi Dialog plug-in, they do let you use calculation fields to display specific dialog messages to specific users—for example, “Chris, ‘someday’ isn’t a valid deadline.”

Developers can also ensure that end users fulfill data requests by allowing them to modify as many as three fields from within these boxes. This lets developers do things such as highlight data problems in a dialog box, where a user won’t be able to miss them, or to have the user enter an internal password for special access to certain layouts or scripts.

These Custom Dialogs are great, but the lack of menus, check boxes, or other niceties limits the options you can exploit to get the information you need.

Getting FileMaker to Talk

FileMaker has rightly boasted of version 6’s XML integration as a key feature, and the world of serious data management dictates that all modern applications must work with XML. FileMaker Pro 6’s XML features finally offer developers an alternative to the trials of dealing with ODBC drivers, kludged systems built with merge files, exports, AppleScript, and so forth.

But XML isn’t for the faint of heart, and good luck finding any mention of it in FileMaker’s manual. To the company’s credit, it offers decent XML resources at www.filemaker.com/xml/.

Showing Potential

Overall, FileMaker Pro 6 has some welcome additions; where it falls down is in its omissions. Security is increasingly important to database developers these days, and it’s a shame that FileMaker’s obscure security dialog boxes haven’t changed much since version 3. It’s impossible to apply security settings globally across a

united group of files, you can’t easily maintain more than a handful of login and password combinations, and the group screen’s user interface is still incomprehensible and counterintuitive.

It would be nice if FileMaker had some common programming elements as well, mainly for power users. For example, many developers would love to be able to copy and paste a selection of script steps from place to place (rather than using only the limited import function), or better yet, to have the option of working in a text editor. FileMaker is still missing any sort of arrays—which would finally make it possible to control, say, repeating fields—and there’s no way to build functions within elaborate calculations or scripts.

Finally, the FileMaker client is still single-threaded, so it can perform only one task at a time—an issue for Web-hosted databases and other systems that use the Web Companion plug-in. Moreover, you can have only 50 files open at once, and FileMaker’s client-server model still depends on high traffic, making it difficult to deploy across the Internet or a WAN.

Macworld’s Buying Advice

All told, FileMaker Pro 6 is a strong upgrade—the addition of XML is a must if you need to have FileMaker interact with another system. While we may wonder whether version 6 can justifiably be called a major release, the new features it contains are quite helpful, and FileMaker remains the easiest database to use or develop for on any platform. □

RATING: ★★★★★

PROS: Handy Custom Dialogs; significantly enhanced XML import and export; flexible extending and constraining of found sets.

CONS: Security still largely dates back to version 3; single-threaded client.

PRICE: \$299; upgrade, \$149

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: FileMaker, 800/725-2747, www.filemaker.com

QUICKTIME 6 PRO

Apple’s Multimedia Technology Adds Welcome Compression Features and Instant-On Streaming

BY CHRISTOPHER BREEN

After months of delay due to MPEG-4 licensing issues, Apple has finally released QuickTime 6. Available in two versions—the free Standard version and the \$30 QuickTime Pro—the latest iteration of this venerable multimedia technology is worth the wait. Both versions allows you to play MPEG-4-encoded movies and more easily navigate streaming Web content. In addition, QuickTime 6 Pro (the version we review here) lets you create audio files smaller—and of higher quality—than those encoded in the ubiquitous MP3 format, and it offers MPEG-4 video encoding.

Big Sound, Small Files

QuickTime’s significant improvements lie beneath the surface. Likely to pique the interest of audio enthusiasts is the inclusion of Dolby Laboratories’ Advanced Audio Coding (AAC) codec—the audio arm of QuickTime’s MPEG-4 encoder. This codec can create audio files nearly indistinguishable from the uncompressed original, at around 7 percent of the original file’s size. We encoded a 4-minute, 40.4MB AIFF file with QuickTime 6’s AAC codec (at the default resolu-

tion of 96 Kbps) to produce a 2.8MB file. This file sounded distinctly clearer than a 4.4MB file produced with iTunes’ MP3 encoder (at the default resolution of 160 Kbps).

Regrettably, AAC encoding is absent in most QuickTime-related applications. Although iTunes can play MPEG-4 audio files, for example, it can’t encode files in this format. Likewise, you can’t export MPEG-4 audio from iMovie.

Screen Test

Although video compressed with the included MPEG-4 video codec lacks the clarity of video encoded with Sorenson Media’s Sorenson Video 3 Pro codec (\$299; 801/287-9400, www.sorenson.com), the Sorenson codec can’t match MPEG-4’s encoding speed. On a 933MHz Power Mac G4 running Mac OS X 10.1.5, we encoded a 78.1MB, 1-minute, 320-by-240-pixel QuickTime movie at best quality with the MPEG-4 video codec, the Sorenson Video 3 Pro codec, and the standard (free) version of the Sorenson Video 2 codec. Sorenson Video 3 took 2 minutes and 7 seconds to compress the file to 48.4MB, Sorenson 2 spent 4 minutes and 3 seconds encoding



A Word from Our Sponsors In QuickTime Player 6, Apple has abandoned more-helpful TV-channel links in favor of those with a more commercial nature.

the movie to 33.2MB, and QuickTime 6's MPEG-4 encoding took a speedy 40 seconds to compress the file to 45.2MB.

The file we encoded with the Sorenson Video 3 Pro codec most closely matched the original movie in detail and color accuracy. In comparison, the MPEG-4-encoded version looked slightly washed out, and its edges weren't as crisp. However, the MPEG-4 version was clearer than the file encoded with the free Sorenson 2 codec. In fact, the 33.2MB Sorenson 2-encoded file looked only as good as the MPEG-4 version of the movie encoded at medium quality—which was a very small file at 16MB.

Streamlined Streaming

QuickTime 6 introduces the Instant-On feature, which allows those with broadband Internet access (112 Kbps or faster) to view streaming content more quickly and move from one location in the stream to another with little pause in the action. This is a welcome feature when it works. In our tests, Instant-On was less than instant on a congested network—leading to stuttering playback and pauses when we scrubbed to a new location. Also, you must have access to Real Time Streaming Protocol (RTSP) ports 554 and 7070—ports commonly blocked by firewalls—to realize the full benefit of Instant-On. Although you may be able to unblock those ports on a personal firewall, your

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RATING: ★★★★★

PROS: AAC-encoded files are small and clear-sounding; MPEG-4 encoding is fast; Instant-On enhances the viewing of Web-based content on compatible systems.

CONS: Links in interface are less useful than channels in earlier versions; not all new capabilities are extended to other QuickTime-compatible applications.

PRICE: \$30

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Apple Computer, 800/692-7753, www.apple.com

SIX DEGREES

Innovative Software Watches Your Every Move and Helps You Retrace Your Steps

BY JENNIFER BERGER

If you sometimes spend far too much time looking for things you just *know* are on your Mac, Creo's inventive software for grouping and presenting information, Six Degrees, may be right up your alley. You could use a combination of Mac OS's built-in search utility, Microsoft Entourage's Find function, and your own intuition to locate your stuff, but Six Degrees saves you that trouble. The OS X-only application lets you pinpoint e-mail messages, contact information, and files anywhere on your computer—even if you don't remember where you put them, who sent them to you, or their file names.

In our tests, Six Degrees proved itself trustworthy and truly innovative, but it had the roughness you'd expect from a 1.0 release. It needs some performance improvements, and the number of programs with which it's compatible is quite limited. Nonetheless, Six Degrees has the potential to change the way we use our Macs.

The Big Picture

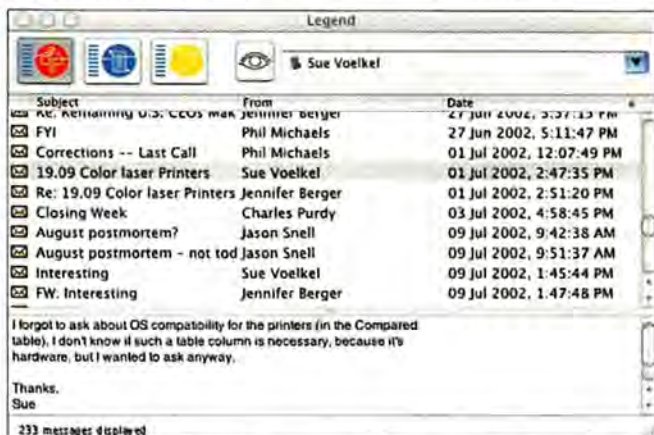
Six Degrees is a one-window utility that runs in the background while you work, "watching" every click you make and then finding the connections between what you've clicked on and what Six Degrees perceives to be related to that item. One instance where this comes in handy is when you want to find your way back through an e-mail thread and its attachments. (As of this version, Six Degrees' e-mail component works only with Entourage X, though Creo intends to expand e-mail-client support.)

As a real-world example of Six Degrees in action, let's say that you and your colleague Sharon are working together on a proposal. And during a harried day last week, you forgot to save the

most recent version in its usual place. Now you need to find it, and the only thing you recall is that the proposal was attached to an e-mail message Sharon sent you. To use Six Degrees to find the file, you'd simply click on Sharon's name in your Entourage Address Book, go into Six Degrees, sort the documents

menu, which stores your entries and allows you to revert to them at any point.

You then use the three buttons to the left of the Focus field to see and sort results by related e-mail messages (red button), files (blue button), or people's names (yellow button), in the results window. You can change the focus, and thus narrow the search, by dragging a result up to the Focus field or by clicking outside of Six Degrees on a file icon anywhere in the Finder, an e-mail message, or name in your Entourage Address Book. After



It's All about Connections Six Degrees finds all e-mail messages, documents, and people's names related to the item in its Focus field (top right); in this case, results are for messages involving a person named Sue Voelkel.

associated with Sharon by date, and boom—there's the proposal. It'll take about 20 to 30 seconds for the search to run its course; but locating a file this way is far more expeditious—and less frustrating—than racking your brain and making do with limited search utilities.

Working Its Magic

Six Degrees displays your results in its easily navigable interface, called the Legend, which offers a clean and intuitive design consisting of four buttons, the Focus field (which contains the subject of your search), a results window, and a blue progress bar. When you click on a file's icon or open a file anywhere on your Mac, Six Degrees displays that file's name in the Focus field and uses it as the starting point for your search. The program also adds the file name to the field's pull-down

a bit of practice, this becomes a very fluid process that lets you home in on exactly what you're looking for.

Enhancing the Basics

Six Degrees is not only powerful but also very complex, and it can become unwieldy and confusing if you're not sure how to use it. Six Degrees is always busy forming new connections in the back-

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RATING: ★★★

PROS: Innovative; very easy to use; well-designed interface; clear, concise printed user guide.

CONS: Can cause serious system slowdowns; finds results slowly; limited application compatibility.

PRICE: \$99

OS COMPATIBILITY: Mac OS X
COMPANY: Creo, 604/451-2700, www.creo.com

COMPACT DV CAMCORDERS

Diminutive but Feature-Packed Cameras Deliver

BY BEN LONG

You already know that having a digital-video (DV) camcorder lets you use your Mac to edit high-quality video. But there's more: DV camcorders not only provide excellent image quality and superfast FireWire capabilities, but also offer the advantage of being much smaller than most of their analog counterparts.

We put four of the latest compact, single-CCD DV camcorders through their paces and found that you don't necessarily have to sacrifice features or quality to get a camcorder that fits in a coat pocket or handbag. Although the Canon Optura 200MC, JVC GR-DVM96U, and Sony DCR-PC120BT and DCR-TRV50 are small, they sport lenses, feature sets, and ports similar to their larger siblings—and produce images of the same quality.

Each of these camcorders has an on-board flash, a removable memory card, and a long list of DV features, and each can take still shots. You do pay a premium for small size, though: the models in our roundup cost between \$1,200 and \$1,900, almost twice as much as larger-bodied models with comparable features. But if portability is your primary concern, these camcorders are the way to go.

Form and Function

As far as design and no-hassle shooting are concerned, any of

these models is a good choice. The Optura 200MC, GR-DVM96U, and DCR-PC120BT have an upright design; the lens is at the top, and a flip-out LCD screen opens from the left side. These camcorders are roughly the size of a portable cassette player but considerably thicker. The DCR-TRV50, with its more traditional, horizontal design, was the largest of the group, while the JVC GR-DVM96U was the smallest. Thanks to their low weight (between one and two pounds), small size, and intuitive control layout, each of these camcorders can be operated with one hand.

The three upright models share other design traits. In addition to their flip-out LCDs, they have traditional eyepiece viewfinders, which are a must for use in bright light or for times when the LCD would suck the remaining life out of low batteries.

Each model has a FireWire port for exporting video to your Mac for digital editing, as well as S-Video and composite connections for attaching the camcorder to monitors, TVs, or other analog-video devices such as cameras and console video decks. All but the GR-DVM96U also provide for analog input, which allows you to dub older analog formats to DV for editing on your computer.

All but the GR-DVM96U offer jacks for an external micro-

phone, and each model sports headphone jacks. The built-in microphones on these camcorders leave much to be desired, so if you intend to record concerts or other performances, you'll want to invest in an external microphone.

Shooting

As you'd imagine, these camcorders' compact designs make them very comfortable to use. Though they all have their idiosyncrasies—the DCR-TRV50, for example, has a very fast zoom control that makes subtle zooming difficult at first—none are so severe that you can't get past them with a little practice.

All provide separate modes for shooting and playback, so they're easy to learn if you've used other models. However, they also offer modes for recording to the memory card instead of to tape. For shooting still photos or video for the Web, this is a great timesaver, as it eliminates the trouble of using a video-editing program to capture the images from your tape. Instead, you can simply use a USB cable to transfer stills directly to your Mac.

With its larger, more standard design, the DCR-TRV50 is also the heaviest of this bunch—weighing in at 1.75 pounds; therefore, it's not quite as comfortable to hold. If you expect to use a tripod often, then this camera's larger 3.5-inch LCD screen

makes it a good choice. Though the other models have nearly identical designs, we like the Canon camcorder for its simple control layout. While both of the Sonys are well designed, their preponderance of features makes them more complicated to use. The JVC lacks some helpful features, such as a jack for an external microphone.

Lens quality is the factor that has the greatest impact on image quality. An inferior lens will affect the camcorder's ability to reproduce color, and it can cause images that aren't sharp; poor-quality lenses also distort images that are zoomed to an extreme. Fortunately, none of these camcorders exhibited serious lens problems. Their lenses fall somewhere in the area of a 40mm–400mm zoom lens—plenty of power for most situations. When compared with the other models, the Optura 200MC is particularly weak on the wide-angle end, but it makes up for that with a stronger telephoto capability.

All of these models offer digital-zoom features, which attempt to simulate the effect of a stronger telephoto lens by digitally enlarging and cropping an image. The results, though, are noisy low-resolution images, and you'll be better served by deactivating digital zoom.

The small, slim batteries included with all of these camcorders are short-life batteries that offer less than an hour of power. You may want to invest in extra batteries or higher-capacity batteries, which cost between \$80 and \$100. Note that longer-life batteries are physically larger



Close-Up We reviewed (from left to right) the Canon Optura 200MC, the JVC GR-DVM96U, the Sony DCR-PC120BT, and the Sony DCR-TRV50.

Compact DV Camcorders Compared

COMPANY	PRODUCT	MOUSE RATING	PRICE	CONTACT	OPTICAL ZOOM/DIGITAL ZOOM	STILL-IMAGE RESOLUTION*	DIMENSIONS**	WEIGHT***	PROS	CONS
Canon	Optura 200MC	★★★★	\$1,899	800/652-2666, www.canon.com	10×/200×	1.3	2.5 × 5.1 × 5.1	1.20	Very good color tone and quality; very good color accuracy; excellent image stabilization.	Oversharpening images.
JVC	GR-DVM96U	★★★	\$1,200	800/526-5308, www.jvc.com	10×/200×	1.0	3.8 × 2.1 × 4.5	1.10	Good image quality; very small.	No input for dubbing analog to DV; no jack for external microphone; resulting images are not very sharp.
Sony	DCR-PC120BT	★★★★	\$2,000	800/571-7669, www.sony.com	10×/120×	1.5	2.4 × 4.9 × 4.9	1.50	Good image quality.	Produces slightly oversaturated color; oversharpening images.
Sony	DCR-TRV50	★★★★	\$1,600	800/571-7669, www.sony.com	10×/120×	1.5	2.9 × 3.6 × 6.6	1.75	Very good image quality; large, 3.5-inch LCD screen.	Largest and heaviest of the four; oversharpening images.

* In megapixels. ** In inches (width × height × depth). *** In pounds.

and will add a bulky protrusion to a slim camera.

When it comes to LCD quality, these camcorders finish in a tie. Each provides an LCD screen that delivers fairly accurate color and good detail. While the Optura 200MC's LCD screen was the most color-accurate, none of these displays are a substitute for a good field monitor if you're serious about color and image quality.

Though a small, light camera is much easier to pack and carry than the big, shoulder-mounted VHS camcorders of old, less is not always more when it comes to shooting. Low weight can make a camcorder difficult to hold steady. To compensate, all of the models offer excellent optical image stabilization. This seemingly magic technology manages to smooth out the slight vibration that comes from holding a camcorder in your hand. Image stabilization is no substitute for a tripod, but it does remove enough jitter to turn otherwise annoyingly shaky handheld footage into stable, easy-on-the-eyes video. Image stabilization is particularly important at long focal lengths where even a little bit of motion is very noticeable. The Optura 200MC's video was just a little steadier than that of the Sony and JVC cameras.

All of these DV camcorders offer automatic-exposure features that yield appropriate exposures for most situations, but there will still be times when you need to take control

of the camera to compensate for challenging lighting—such as shooting into bright windows or sunlight—or other difficult shots. Each also offers special preprogrammed modes for backlit scenes, sports photography, sand or snow, and objects illuminated by a spotlight. When shooting in these modes, the camcorder simply prioritizes shutter and aperture settings that are appropriate for these situations.

Image Quality

Image quality should be your main criterion when you select a camcorder, and all of these cameras deliver images that are much better than what you can get from consumer analog formats such as Hi8 or VHS. The good news about DV is that you really can't go wrong when choosing a camcorder. However, the color and overall image quality of the Optura 200MC and DCR-TRV50 make them the standouts in this group. Though the lowest common denominator of image quality in the DV format is pretty high, some cameras do yield better images than others.

All the camcorders in this roundup deliver good color, contrast, and detail in a variety of lighting situations, but each has its own image peculiarities. The DCR-PC120BT, for example, provided slightly oversaturated color, with reds that tended more toward magenta. Surprisingly, the DCR-TRV50, which seems to have an identical lens and

almost identical feature set, produced slightly more-accurate and much less saturated images.

The Optura 200MC mirrored the DCR-TRV50 in terms of overall color tone and quality, while the GR-DVM96U displayed slightly more color saturation, though not as much as the DCR-PC120BT. To our eyes, the less saturated images looked better, leading us to favor the Optura 200MC and DCR-TRV50 for color reproduction.

Overall, the GR-DVM96U produced images that were consistently softer than those from the other camcorders. Image detail was not as good, and images were less pleasing overall.

Unfortunately, all of these camcorders suffer from a problem common to single-CCD video camcorders: oversharpening. Like digital still cameras, DV camcorders employ sharpening algorithms to improve their images, and these camcorders all go way too far; they produce images with ugly aliasing patterns that appear when an object, or the camcorder, moves about. We were very disappointed to see that not one of these models offers a choice of sharpening levels. These annoying artifacts noticeably separate this class of cameras from the higher-quality (but larger in size) 3-CCD cameras that fall into this price range. Again, the Optura 200MC wins out over the Sony models for its slightly less aggressive sharpening.

Still-Image Quality

All of these camcorders offer 1-megapixel image sensors for shooting still images. Though these sensors offer no improvement in video quality, they do yield a 1-megapixel still image. To accommodate still shooting, all of these camcorders include a media slot (MemoryStick on the Sony cameras, Multi-Media Card on the others), for storage of still images, and pop-up flash units for low-light still photography.

Though the idea of a single, small device that can shoot high-quality video and still photos is very enticing, it is, unfortunately, just an idea at this point. The still-image quality of these camcorders is far lower than what you could get from a \$200 1-megapixel digital still camera. All of these DV camcorders produced noisy stills that lacked detail and were plagued by artifacts; in a pinch, they might be acceptable for simple snapshots and a few other types of still photos.

Macworld's Buying Advice

Each of the four DV camcorders we tested performed some tasks better than others. But we highly recommend the Canon Optura 200MC as the best overall value. Though it suffers from some oversharpening, its overall image quality, satisfactory feature set, and extraordinary image stabilization make it an excellent buy if you need a small, capable DV camcorder. □

EYETV

Inventive Video-Recording Solution Heralds the Close of the Mac-TV Gap, Despite Some Quirks

BY JONATHAN SEFF

You've probably heard of services such as TiVo and ReplayTV—you may even use one of them. Now El Gato Software's EyeTV brings the concept of the personal digital video recorder (DVR) to the Mac, letting you record shows directly to your hard drive so you can watch them whenever you want. EyeTV isn't for everyone, and it has a few kinks that need to be worked out, but it's a very appealing first step toward integrating your Mac with the latest TV-watching technology.

The Basics

EyeTV's hardware is a white box about one-quarter the size of a set-top DVR, and it's powered by USB from your Mac. The box contains a 124-channel cable tuner and a hardware encoder that turns an incoming signal into MPEG-1 video in real time. On the outside of the box are a jack for a standard coaxial cable; composite RCA jacks that let you capture video from a VCR, camcorder, or other analog source; a USB port for connecting EyeTV to your Mac; and lights that indicate the recorder's status.

It's the software, however, that makes EyeTV not just a USB video-capture device but a full-fledged DVR. Once you use EyeTV 1.0.2's simple Setup Assistant, you're ready for prime time and can begin watching live TV on your Mac. A floating on-screen interface that looks like a remote control gives you access to functions such as play, pause, record, jump (for skipping 30 seconds at a time—ideal for avoiding commercials), and instant replay (for jumping back 7 seconds). Although EyeTV

doesn't come with a handheld remote, Keyspan's \$49 Digital Media Remote (510/222-0131, www.keyspan.com) is compatible with EyeTV.



Techie TV EyeTV plays live and recorded programs, and it lets you control both with an on-screen remote.

The Live Stuff

Like other DVRs, EyeTV has a recording buffer that captures whatever you're watching—it's this feature that allows for conveniences such as pausing live TV and using the instant-replay function. While TiVo's buffer is set at 30 minutes, you determine how much hard-drive space EyeTV puts aside for its buffer, which can accommodate much more than 30 minutes. But unlike TiVo, EyeTV doesn't let you record an entire program if you begin recording after it has started.

You can view live programs in windows of several sizes (even as large as the full screen) as you watch them. But viewing them at anything larger than the Normal Size setting, which is a very small 320 by 240 pixels, will result in a slightly pixelated and blurry picture.

One nagging problem is that EyeTV takes several seconds to actually change a channel after you click to change it, so EyeTV isn't a good option for channel surfers.

Scheduling Recordings

You can record a program simply by clicking on the record button on EyeTV's on-screen remote or by manually inputting start and stop times for a particular channel, as with a VCR—but the real power of a DVR lies in its ability to schedule programs with much less fuss.

EyeTV gives you access to upcoming program listings via a Web site, TitanTV.com. The listings are free, unlike those offered with set-top DVRs: on top of hardware costs, TiVo charges \$12.95 per month or \$249 for a lifetime membership; ReplayTV charges \$250 for a lifetime membership. (One caveat is that you must use Internet Explorer to access the TitanTV.com listings.)

When you find a program you want to record, click on the red record icon in the listing on the Web site. Click again, and your browser downloads a small file that tells EyeTV what to record and when. From within the EyeTV software, you can also schedule manual recordings, pad them on either end, and create recordings that repeat daily and weekly.

One important difference between EyeTV and set-top DVRs is that a set-top DVR is a computer that's always running, but using EyeTV requires that your Mac be on and awake whenever you want to record. EyeTV won't start up your computer, nor will it wake your Mac from sleep to start a recording.

Image Quality

The amount of hard-drive space EyeTV uses is hardly paltry, but it's reasonable given the picture quality you get. The size of recordings always appears on your monitor at 320 by 240 pixels, but the quality is not as good as that of MPEG-2-quality DVRs. You can pick one of two quality settings for recording your shows. The Normal Size option uses a data rate of 170 Kbps, which translates to about

615MB of hard-drive space per hour; the high-quality option is double the data size, and it looks better.

You can pick either option for all shows, but currently the software doesn't allow you to record individual programs at different quality settings. You can also opt to record to any hard drive you want, and the number of hours you can store depends solely on the size of your drive.

Once you've recorded something, you get to take advantage of the nonlinear, hard-drive-based benefits of EyeTV. Just as with a DVR, you can watch any program in any order and delete individual shows. You watch programs from within the EyeTV viewer, and can do so at any size, just as when you use EyeTV to watch live TV.

EyeTV also gives you the power to permanently archive your shows after you've watched them. You can save them as QuickTime MPEG-1 files, playable on any Mac (or PC) with QuickTime Player. Also, you can burn standard-quality videos to a VideoCD, which will play on computers and many newer set-top DVD players.

Macworld's Buying Advice

EyeTV is not a direct replacement for a set-top DVR, but it brings most of the benefits of DVRs to your Mac—and in some cases adds to them. At only \$199 and no monthly fees, the price isn't bad. And for anyone who travels often with a laptop—or who wants to use a Mac as a primary TV viewer or video archive—EyeTV is a very creative solution. □

RATING: ★★★

PROS: Easy to use; recording time limited only by your hard drive space; free program listings; can save to QuickTime and VCD formats.

CONS: Mac needs to be on and awake to record; slow response time with changing channels; programs can only be recorded at default quality.

PRICE: \$199

OS COMPATIBILITY: Mac OS X

COMPANY: El Gato Software, www.elgato.com

AVID XPRESS DV 3.5

Answer to Apple's Final Cut Pro Was Worth the Wait

BY ANTON LINECKER

When Avid announced that it was releasing an OS X-only version of its formerly Windows-only Xpress DV professional video-editing software, many video pros immediately took notice. With more than 100 real-time effects, real-time color correction, and strong media-management tools, Xpress DV's feature set easily rivals that of Apple's Final Cut Pro. Video editors who use Macs will now have to choose between the two programs.

That Avid Feeling

Avid Xpress DV 3.5 comes in two consumer flavors, both of which work only on G4 systems: Xpress DV and Xpress DV PowerPack. The latter includes Avid's FilmScribe, a matchback program for generating film cut lists, and full versions of Boris FX 6.1 and Graffiti 2.1. Xpress DV ships with both the OS X and the Windows XP software, although you can run only one version at a time because the program requires a USB dongle.

For seasoned Avid professionals, Xpress DV is like manna from heaven—it feels and works like any other Avid product, such as the high-end Symphony. You can even quickly personalize Xpress DV to resemble your favorite Avid system by importing your user profile from one to another.

But for loyal Final Cut Pro users, Xpress DV may be daunting at first. Its interface is radically different from Final Cut Pro's, as is its workflow (for example, you may wonder how to apply an effect). But once you get past this unfamiliarity, Xpress DV shows its true colors: it's a program for serious video editors.

Editing with Xpress DV

Editing with Xpress DV is less tactile than with Final Cut Pro (for example, although you can grab clips and slide them around, you won't tend to work that way), but it's still effective and efficient.

It also runs remarkably well in OS X, something that took Apple two updates to achieve with its OS X version of Final Cut Pro. (One editing feature the Avid faithful will surely miss is the JKL Trim mode, found in higher-end Avid systems, for changing edit points on-the-fly.)

In addition to standard capture methods, Xpress DV offers the Record tool, an option that lets you log your clips as you digitize them—a nifty little time-saver. Moreover, Xpress DV has a DV scene extractor that divides your media into subclips based on where your DV camera started and stopped recording.

When it comes to real-time (RT) effects, Xpress DV openly challenges Final Cut Pro. Xpress DV has more than 100 such effects, including a broad range of blend, wipe, key, matte, and motion effects. And Xpress takes a different approach to playback of RT effects. Where Final Cut Pro plays back only effects it knows it can play without dropping frames, Xpress DV plays back all RT effects to the best of its ability. In some cases, if you've stacked effects and titles, this results in some stutter, but the preview is still useful. Final Cut Pro, on the other hand, forces you to render effects first, defeating the purpose of a RT preview. (Xpress DV lets you toggle between a RT mode and a DV mode. In DV mode, you'll need to render all effects to play them.)

Like Final Cut Pro's, Xpress DV's RT effects previews don't travel over FireWire. But you can see the effects on a large monitor if you have an ATI Radeon video card in your desktop system or a PowerBook G4 with an S-Video-out port.

Xpress DV 3.5 has two settings for video playback: High Quality, which limits the number of RT effects, and High Performance, which lets you play many more RT effects—at the expense



Expand Your Color Palette Via a split screen, Avid's Color Correction mode lets you compare your adjusted color setting with your clip's original color. Snapshots of previous and upcoming scenes help you maintain color continuity.

of video quality. The substantial impact on video quality with the latter option makes lip-synching difficult to recognize. This setting is helpful when you're previewing very complex effects sequences, but it should not be used for normal editing.

Color Correction

Xpress DV offers a powerful color corrector, refining the process beyond even Final Cut Pro's 3-way Color Corrector. Xpress DV displays three video windows while in Color Correction mode. The middle window shows the current scene, and the windows on either side show the previous and next scene. This way, you can see how the scenes work with one another. You can also change these side windows to display the waveform and vectorscope values for the current frame (although, unfortunately, these values don't change dynamically as you play the video). And you can even split the window so you can compare your adjusted color with the clip's original color.

Expandability or Compatibility?

As the name suggests, Xpress DV edits the DV format. In fact, it edits *only* DV—don't expect a low-resolution option like Final Cut Pro's OfflineRT. You also can't expand Xpress DV's capabilities to work with uncompressed video: there's no com-

patible video capture card. While these limits somewhat restrict Xpress DV, they also reduce the possibility of conflicting project settings—the source of many problems for Final Cut Pro video editors.

But for Xpress DV, Avid lauds compatibility above expandability. All Xpress DV projects can be seamlessly imported into higher-end Avid systems for finishing—there are no messy edit decision lists to worry about. For example, you can use Xpress DV to edit a documentary at home and then finish your uncompressed video master at a facility with a Symphony system.

Macworld's Buying Advice

Avid Xpress DV 3.5 will meet the expectations of video editors seeking a reliable, feature-rich DV editing solution. But if you want expandability or low-resolution offline capabilities, consider Final Cut Pro or Avid's higher-end offerings. □

RATING: ★★★★★

PROS: Great color-correction interface; versatile RT effects; stable; upwardly compatible project files.

CONS: No offline RT format; not expandable; no support for G3 processors; no JKL Trim mode.

PRICE: \$1,699; Power Pack, \$2,499

OS COMPATIBILITY: Mac OS X

COMPANY: Avid, 800/949-2843, www.avid.com

REASON 2.0

OS X-Compatible Music-Sampling and -Synthesis Software Looks, Feels, and Sounds Right

BY DAVID LEISHMAN

Sure, first impressions are important. But second impressions matter, too; they tell you whether your initial excitement will lead to a productive relationship. And so it is with the release of Propellerhead Software's Reason 2.0 (distributed by M-Audio), which provides a good opportunity for musicians—from studio professionals to enthusiasts—to become better acquainted with a great music-sampling and -synthesis program. This update introduces new instruments and sounds, as well as OS X compatibility, and it may be just what you need if you're ready to finally retire your hardware-based system.

A Pretty Face

Version 1.0 (*Reviews*, May 2001), released in January 2001, has been the sweetheart of reviewers and audio professionals for both its interface and its sound quality, though the interface—which displays a simulated hardware rack for mounting devices that generate, sample, control, and modify sounds—is always mentioned first among its charms.

Reason presents virtual real-world tools in a way that's accessible to beginners and second nature to many experienced musicians. When you launch the application, it displays a rack full of equipment; you can remove any device simply by highlighting it and then deleting or cutting, and you can add devices via the Create menu.

Reason 2.0 offers sound-wave synthesizers, sampling and looping modules, time-based-effects devices, and drum machines; you can use any of these either individually within the application or, with music-sequencing applications such as Steinberg's Cubase

and MOTU's Digital Performer, as a group of sound modules.

The interface's main drawback—and we use this term very loosely—is that it offers more device choices than can be fully displayed at once. You can toggle between a full-size and a basic view of the devices. The latter view allows you to see the full controls for two or three modules, but you then have to scroll and toggle to use other devices.



Storm Control Reason 2.0's Malström Grainable Synthesizer is a powerful addition—with an accessible interface—that offers a number of versatile tools for manipulating its sounds.

There are a couple of possible workarounds, but neither one solves the problem completely, as both require the right hardware. You can use a mouse with a scroll wheel to move up and down the rack with lightning speed, or (new in version 2.0) you can detach the Sequencer window—for selecting and modifying tracks—and move it to a second monitor, in essence forming a second rack. Perhaps Propellerhead will let users add devices to the second—or even a third—rack in the next major release, as maximum visual working space is a must-have in digital-audio production.

Working Together

Reason 2.0's rich sonic tool chest includes devices found in version 1.0: a patchbay; a mixer; reverb and delay units; and sound units—the Subtractor analog synthesizer, ReDrum rhythm maker, and Dr. Rex loop player—that come with a full

complement of filters and modulators. Any device can have multiple instances and signal paths, and its functionality is limited only by your hardware and imagination. Changing signal paths is intuitive: just press the tab key to turn the rack around, and then select an output patch cord and drag its other end to an input channel on the desired device.

Version 2.0 adds two sound devices to the roster: the Malström Grainable Synthesizer and the NN-XT Advanced Sampler. Like the Subtractor, the Malström lets you generate and modify sound waveforms; however, it also gives you the ability

You could spend a *lot* more money to get richer samples, but these stand up admirably in a mix.

Compatibility

Reason 2.0 plays nicely with OS 9.0.4 and later, and OS X 10.1 and later. The OS 9 version requires OMS (Open Music System) 2.X but can't run with virtual memory turned on. We tested the program on a 450MHz Power Mac G4 running OS X 10.1.5, with the G4's built-in sound hardware. Everything functioned without a hitch, but Propellerhead notes that in OS X, you'll need a driver to use third-party audio hardware. (These products should have OS X 10.2 support by the time you read this; we conducted our tests just prior to Jaguar's release.)

The company adds that Reason 2.0 supports basic MIDI operations for all interfaces and devices that OS X supports; however, advanced features may require device drivers. Currently, Reason 2.0 can export AIFF and WAV files, and it works with ASIO- (Audio Stream Input/Output) and Sound Manager-compliant applications.

Macworld's Buying Advice

With its wealth of tools and sound samples, Reason 2.0 is a great application for its price. Reason's user-friendly interface lets beginners make music right away, and the program has plenty of capabilities to keep anyone's creative juices flowing. It just might become your best musical friend. □

RATING: ★★★★★

PROS: Familiar, fun interface; wide array of useful sound devices; support for 24-bit samples and SoundFonts; OS X support.

CONS: None significant.

PRICE: \$399; upgrade, \$99

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Propellerhead Software, 800/969-6434, www.m-audio.com

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NETMINDER ETHERNET 5.0

Network Analyzer Brings Clarity to Troubleshooting

BY JONATHAN A. OSKI

"The network is slow" is an end-user complaint that rings constantly in the ears of many network managers. But all too frequently, the user gives no specific description of *slow*—instead, the statement is simply a clue that something, somewhere, *might* be wrong.

When you face this kind of problem, a network-analyzer program, such as Neon Software's recently released NetMinder Ethernet 5.0, can quickly give you the insight you need. Now available as an OS X-native app, NetMinder Ethernet is an appealing and extremely useful tool that provides administrators with easily accessible and understandable information on the nuances of Ethernet packet transport.

Quickly Gain Intuition

Neon's focus on ease of use lets any network manager—not just wireheads—quickly monitor a network. When you launch NetMinder Ethernet, it opens four windows that allow you to control data collection and view Ethernet packets, analyze IP usage on an address and protocol basis, analyze bandwidth-usage trends, and discover problems with specific packets. Once you start collecting information, you can use the TCP/IP Analysis window to see which nodes and protocols are consuming the most bandwidth on your network.

A common question network managers get is "How much network bandwidth is consumed by Web browsing?" The TCP/IP Analysis window can quickly tell you what percentage of your network traffic is HTTP or HTTPS, the two primary IP protocols used in Web browsing. Likewise, you can use the Trend Analysis window to see how many packets are being transmitted and what percentage of the theoretical amount of bandwidth this represents. And NetMinder

Ethernet's Packet Inference window displays messages that can alert you to possible aberrant traffic on your network. The Packet Inference feature compares Ethernet traffic with a pre-defined set of rules and alerts you when noteworthy events occur, such as an attack by a network

If you're monitoring a very busy segment of your network, finding the packets you're looking for among the thousands that you'll collect in a few seconds could be very time-consuming. Using NetMinder Ethernet's filters, you can zero in on problematic traffic by specifying a source, destination, and protocol (including granular details specific to each protocol, such as flags or packet size). You can apply filters during the data-collection process or use them

work. For example, you may be trying to track down a rogue computer that's intermittently causing problems on your network. You tell the application to send you an alert—via pager, e-mail, or SNMP trap—when the event occurs. Just about any condition can trigger these alerts, which can incorporate filters and Packet Inference messages, giving you quite a bit of flexibility in your troubleshooting tactics.

Runs Almost Anywhere

NetMinder Ethernet requires either OS X 10.1 (or later) or OS 7.X (or later)—that is, it will run on just about any Mac that has an Ethernet interface. There are some limitations on pre-OpenTransport platforms, because packet collection will require dedicated use of the Ethernet interface.

Though not mentioned anywhere in the documentation, NetMinder Ethernet can also be used on 802.11 wireless networks. The application treats a wireless interface (for example, an AirPort card) as another Ethernet interface.

Macworld's Buying Advice

No network manager should be without a network analyzer. Other dedicated analyzers, such as Network Associates' Sniffer, don't run on a Mac and can cost \$10,000 or more, but thanks to lower-cost offerings such as NetMinder Ethernet 5.0, you don't need to spend a fortune to know more about your network. Whether you're troubleshooting a problem or performing a simple baseline study of your network traffic, NetMinder Ethernet's depth and ease of use make it ideal for any Mac network administrator. □

RATING: ★★★★★

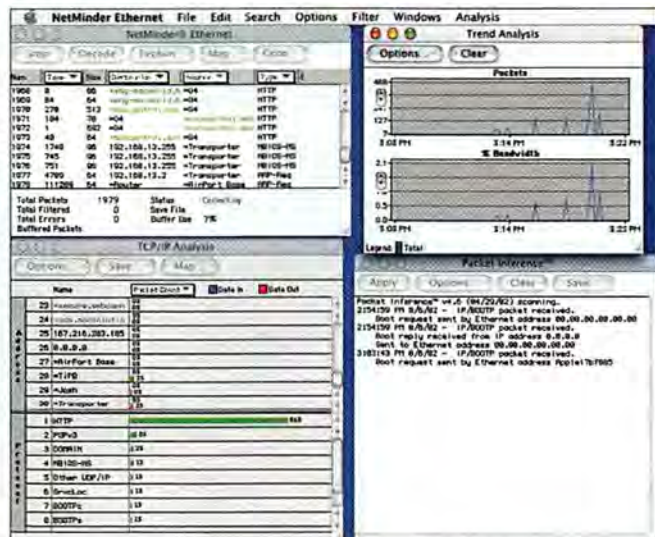
PROS: Easy to use; timesaving software; accurate.

CONS: Some IP protocols not recognized without customization.

PRICE: \$795

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Neon Software, 925/283-9771, www.neon.com



Knowledge Is Bliss The four windows that appear when you launch NetMinder Ethernet give you tremendous insight into the state of your network.

worm (Code Red, for example) or the appearance of a duplicate IP address on your network. These alerts can prompt you to disable switched ports or isolate susceptible servers until the attack or problem can be mitigated.

Digging Deeper

NetMinder Ethernet decodes a variety of packet types; double-clicking on any packet in the NetMinder Ethernet window displays the headers and data contained in the packet. (You can define additional Ethernet-based protocols for identification, but this manual process requires a detailed understanding of the packet header and other characteristics.) Reviewing network conversations on a packet level is often useful when you're trying to see whether a host or application is functioning properly.

on data you've already collected, to sift through raw data—including captures made with the command-line utility TCPdump.

Wake-up Call

Reports of problems on your network are often intermittent and anecdotal—and therefore difficult to fix. For example, a user may tell you that he always has trouble with an application late in the afternoon. Unless you're watching your network when the problem occurs, you'll have a hard time determining the possible causes. NetMinder Ethernet's ability to automatically begin data capture based on a time or a network event allows you to begin your triage without sitting in front of your workstation.

NetMinder Ethernet can also alert you when specified conditions or events occur on your net-

MATHEMATICA 4.2

Feature-Rich Math Program Integrates with the Web, Adds Full Java Support

BY CHARLES SEITER

Wolfram Research's Mathematica program really has no competitors at this point, even though MathWorks' MATLAB is returning to the Mac this year, and Waterloo Maple's Maple is still available.

With Mathematica 4.1 (see our review at www.macworld.com/2001/02/05/reviews/mathematica.html), Wolfram added OS X compatibility and some significant mathematical functionality, but recognition of the Web and preliminary integration with Java were the most innovative aspects of that version. Now, along with the wealth of math-feature additions you'd expect in a Mathematica update, version 4.2 offers full XML support and Java capabilities, with its own Java run-time engine.

Even More Math

New mathematical capabilities in version 4.2 include analysis of variance (ANOVA), making statistics in Mathematica nearly as feature-rich as a dedicated statistics software package such as SAS Institute's StatView. Combinatorica, a package bundled with Mathematica 4.2, provides the most complete library of symbolic elements and functions for finite mathematics that there is—and it has 230 functions more than the older, discrete Combinatorica package. These functions are indispensable for graph theory, commonly used to generate solutions to network structural problems.

The other important math-function improvements are upgrades for linear programming, and global optimization of multidimensional functions, making Mathematica 4.2 a more useful program for those engaged in business and the social sciences.

Nminimize, the new optimization command in version 4.2's Numerical Math package, for

example, provides you with four different methods for global optimization—genetic programming, nonlinear simplex algorithm, simulated annealing, and random search—so you can now compare your results to ensure exact minimization. As a testament to Mathematica 4.2's value, the same methods for global optimization are also available individually in other programs on the market, but they will cost you thousands of dollars each.

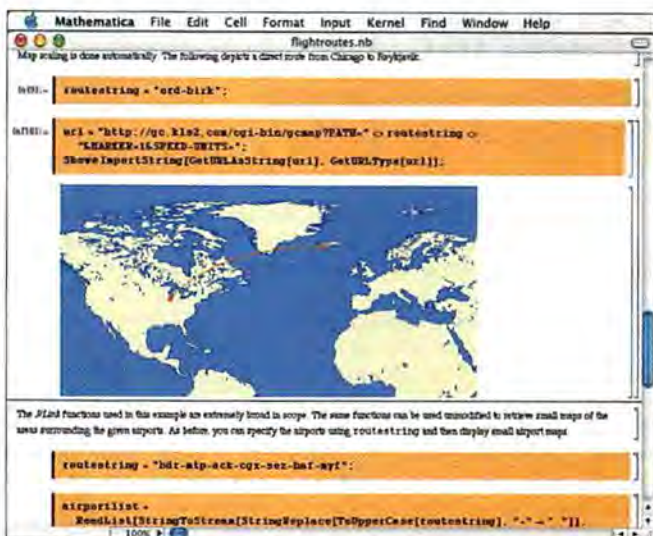
Stronger Ties to the Web

Wolfram incorporated its experiments with MathML—the math-representation standard based on XML—into version 4.1, and these experiments have evolved into complete integration of MathML with XML in version 4.2. You can convert individual Mathematica expressions to XML with the simple command `ExpressionML`. Similarly, the program allows you to convert whole Mathematica notebooks to XML documents by using the `NotebookML` action.

You're also able to change Mathematica XML expressions back and forth to Java DOMs (Document Object Model). Java DOMs let you use standard Java classes to modify your document, making it easy to automatically sort data, graph it, and use Java to generate reports.

Importing information from XML source files to Mathematica XML format is as simple as exporting information from Mathematica to the Web. This means that analysts will soon be processing the financial data piling up on the Web as *.xml* data files with Mathematica's computational packages for time-series processing and options trading. Wolfram Research's offerings are among the most popular with math-oriented traders.

But although the XML and Java language functions provide



Come Fly with Me Mathematica's own Java run-time engine interprets a Java program that draws flight paths on a map, and it displays the combination of routes inside a notebook.

more flexibility, they're not as efficient as MathML itself—if you're porting a Mathematica notebook with graphics to an XML document, for example, you'll have ample time to go get yourself a cup of coffee before the process is complete.

In version 4.1, Wolfram introduced J/Link, which allows you to evaluate Mathematica statements in another program (in this case, a Java program). Version 2.01 of the J/Link tool kit in Mathematica 4.2 also lets you call Java programs directly from within a Mathematica notebook (see “Come Fly with Me”).

In effect, you can use Mathematica as a scripting shell to build and test Java classes. Financial-service companies have already started using version 4.2 to build Web sites that use Mathematica for back-end computation and have a colorful Java-built graphic front end.

Print for Professionals

Despite its online integration, Wolfram has not neglected good old-fashioned print, which is still the format of record for most academic activities. Mathematica notebooks have long supported a fairly rich set of word-processing features. But a new package in 4.2 offers palettes for automatic indexing, producing a table of contents, controlling

pagination and print details (header and footer size and placement, among others), creating side-by-side text and graphics, and integrating material with the Mathematica Help browser. The authoring tools alone are worth the price of the upgrade for users intending to produce books, long articles, or course materials.

Macworld's Buying Advice

Compared with MATLAB and Maple, Mathematica 4.2 is in a league of its own. It has the largest scope of math functionality, the most complete set of features for print and Web publishing, and exemplary compatibility with OS X. If you're looking for the highest level of functionality, industrial and academic acceptance, and Mac support, Mathematica 4.2 is what you want. □

RATING:

PROS: New math functions for business and pure math; full XML support; full Java implementation.

CONS: New XML and Java functions are a bit slow.

PRICE: \$1,880; upgrade prices available for owners of previous versions

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Wolfram Research,
800/441-6284, www.wolfram.com

SPAMFIRE 1.2

Accurate E-mail-Filtering Program
Puts the Choices in Your Hands

BY GEOFF DUNCAN

No one disagrees that spam is the scourge of the Internet, but what can the innocent spam victim do? One option is to use your e-mail program's rules or filters to identify spam, but spending endless hours refining them is no fun. And if your ISP combs through your e-mail for you, it might block items you *want*. Matterform Media's Spamfire 1.2 puts both general spam-fighting filters and highly configurable individual settings into the hands of the person who best knows your e-mail—*you*. Spamfire works with any e-mail program, but to do its job, Spamfire must download the spam to examine it, and the program may not be flexible enough for some power users.

The \$29 Pro version of Spamfire supports multiple accounts and includes 12 months of filter updates via the Internet. The \$19 Lite version supports a single account and doesn't include online filter updates.

Spamfire works by checking your e-mail before your e-mail program does; it logs in to your POP mailbox and screens any waiting messages. (Spamfire 1.2 does not support IMAP accounts, AOL, Hotmail, or Web-based e-mail services, but support for IMAP should be available in the near future.) If a message looks like spam, Spamfire downloads it so you can review it later and then deletes it from your server. When Spamfire finishes, it activates your e-mail program and delivers your "good" messages to your in-box.

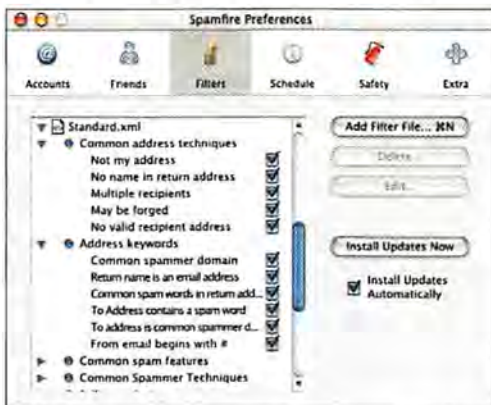
Spamfire applies its entire rule set to each message, and each match adds points to what Spamfire calls the message's "spam score." You set Spamfire's threshold between 0 and 100 points for each account: a low threshold means more mail is blocked; a high threshold means more mail gets through. You can enable or disable any of Spamfire's filters and create your own. Spamfire also has a Friends List that can be imported from your e-mail program's address book, and it always accepts messages from addresses on that list.

In our tests, Spamfire did a good job, typically identifying correctly more than 80 percent of the spam it encountered. Messages identified as spam are added to Spamfire's Spam List. If you see a message Spamfire shouldn't have blocked, you can rescue the message so that it's sent back to your e-mail program. Unfortunately, though, Spamfire

does not indicate which messages you've already rescued; this can be confusing.

Spamfire's effectiveness varies with the nature of the e-mail you receive, along with the number of accounts and addresses you manage. Spamfire will often block messages from mailing lists, but many lists can't be placed on the Friends List because messages come from hundreds of people. Instead, you must create filters that give *negative* spam scores to mailing lists, offsetting points added by the other filters.

Another problem is that after Spamfire's initial screening, new messages may appear in your e-mail program as already read. (To counter this, you may be able to tell your e-mail program to mark all incoming mail



Highly Personal You can select or deselect any of Spamfire's message filters in the Preferences window, and you can create filters of your own for mailing lists and other legitimate e-mail.

as unread.) Finally, Spamfire checks all accounts on one schedule, which may be a problem if you need to check some accounts more or less often.

Macworld's Buying Advice

Spamfire is an easy-to-use way to add sophisticated, configurable, rule-based filtering to your e-mail. It can't spare you the bandwidth of downloading spam in the first place, and users with several accounts on different schedules may chafe at some of its limitations, but if you have a handful of accounts, Spamfire is a very good program at a bargain price. □

RATING: ★★★★★

PROS: Straightforward; flexible and user-configurable; Pro version supports multiple accounts.

CONS: Doesn't handle IMAP, AOL, Hotmail, or Web-based e-mail services; scheduling limitations; does not indicate whether a filtered message has been rescued.

PRICE: Spamfire Pro, \$29; Spamfire Lite, \$19

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Matterform Media, 505/747-1220,

www.matterform.com

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CARRARA STUDIO 2

3-D-Animation Software Offers Realistic Rendering and Animation, without Breaking the Bank

BY BEN LONG

It's true that Eovia's Carrara Studio 2 lacks the advanced modeling tools and scriptable animation that high-end 3-D-animation systems such as Alias|Wavefront's Maya, NewTek's LightWave 3D, and Electric Image's Universe have. Nor does it provide a similar maniacal level of control over every detail. But the latest version of Carrara does offer beginning animators—and even professional designers—engaged in Web, print, and video graphics a reasonably rich feature set and ease of use, at a low price: \$399.

The Sum of Its Parts

Carrara's interface and features clearly show its MetaCreations Ray Dream Studio and Infini-D ancestry. Unlike a software tool that was built from the ground up, or that evolved naturally in response to user requests, Carrara is something of a Frankenstein monster: the parts work, but they don't go together as well as they could.

Carrara's interface monopolizes the Mac's screen, largely with empty space, and disables the Dock. Although this gives you an uncluttered screen to work on, we would much prefer access to our desktop, along with floating windows that put all of our tools in reach.

While Carrara is easy to use overall, its interface eschews some important usability conventions, such as transformation widgets that let you know which axis you're moving or scaling an object on, and snaps for precisely editing and aligning components. Each time you use a tool, you'll have to reset its options because Carrara reverts to default values after every operation. One new interface aspect we *do* like, however, is that control-clicking anywhere on the screen instantly brings up a palette of navigation tools.

Building Blocks

When it's time to actually build something, Carrara offers several types of modeling, each in a distinct module. The Spline Modeler is the default environment for creating 3-D objects. This tool lets you make a variety of swept or extruded shapes, using Bézier splines as both cross sections and extrusion paths. Although its interface is fairly easy to grasp with some practice, the modeler's powers are limited to creating simple, single-surface extrusions and tubes.

Eovia bills Carrara's Vertex Modeler as the "advanced" modeler, but in our experience it's really the easiest to use for most types of 3-D work. This module lets you work with individual vertices, edges, and faces on any surface. And it lets you sculpt any shape—if you have enough patience. Hidden inside the Properties window of the Vertex Modeler is our favorite new feature in Carrara: the Smooth tool, a simple but effective subdivision surfacer. It lets you create detailed organic surfaces—such as faces, hands, and animals—by smoothing relatively simple polygon cages.

Other types of modeling include Text, for creating 3-D type; Terrain, for creating landscapes and backdrops; and Meta-balls, blob-like shapes that blend like mercurial clay, useful for quickly creating lumpy objects such as wax drips on the edges of a candle.

Photon Torpedo

Carrara's surfacing (or texture-mapping) features pack lots of power but take considerable time to learn. You can create any kind of realistic or fictional surface by combining and layering complex combinations of color and material properties. This ability is complemented by Carrara's very good rendering quality. Another new feature in Carrara is Photon



Name That Toon Subdivision surfaces let you easily create realistic—or not-so-realistic—organic shapes, such as this three-fingered rodent glove.

Mapping, which is a type of radiosity rendering. The results of this rendering algorithm are both wonderfully rich and agonizingly slow to render. The program also now includes an option for rendering *caustics*—the patterns created by light refracting through transparent surfaces.

Designers will also welcome Carrara's lighting options, which include standard lights—such as point, spot, and directional—and unusual options such as Moon, which creates moonlight effects in conjunction with the atmosphere, and Anything Glows lights, which turn object geometry into light sources.

3-D with Character

Carrara's animation is impressive for an application in its price range. You can animate objects and hierarchies with a good level of control, and you can access motion curves that let you fine-tune the timing of movements.

The program even offers an excellent introduction to character animation. Carrara Studio 2 introduces inverse kinematics and bones, which let you animate lifelike characters by attaching them to an underlying skeleton with realistic joints. On the performance front, the software is reasonably responsive, if not snappy, on a dual-450MHz Power Mac G4.

Carrara renders high-quality still images and image sequences in most of the standard file for-

mats, and the program can render QuickTime movies at any resolution. We really like the batch renderer that lets us queue up a bunch of renderings and then go to lunch. Eovia has announced a plug-in, VectorStyle, that will render Flash files; while it was released too late for evaluation in this review, it should be available by the time you read this.

Macworld's Buying Advice

While the program is a sometimes inelegant amalgam of Ray Dream Studio and Infini-D, Carrara Studio 2 is a good, low-cost, easy-to-use 3-D solution for creating a wide variety of graphics and fairly modest animations. Although its interface needs improvement, newcomers to the 3-D arena will find it a capable tool for creating all kinds of realistic 3-D artwork, and it offers enough special effects and animation capabilities to keep the creative juices flowing. □

RATING: ★★★

PROS: Cool 3-D features; easy to learn and use; very good rendering quality.

CONS: Tedious interface; limited control for modeling and fine-tuning effects.

PRICE: \$399

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Eovia, 858/457-5359, www.eovia.com

SLICK TRANSITIONS AND EFFECTS VOLUMES 3 AND 4

Two New Plug-in Collections for Apple's iMovie 2 Offer Pro Effects at a Consumer Price

BY JEFF CARLSON

As the pioneer in the small but lively realm of iMovie 2 plug-ins, GeeThree offered transitions and effects that were equal parts useful and whimsical. To further differentiate its lineup from products by competitors Vixen and eZedia (*Reviews*, October 2002), GeeThree has focused on delivering more-practical tools in its latest pair of plug-in sets, Slick Transitions and Effects Volumes 3 and 4. Now you can create shots with split-screen or blue-screen effects, for example, without jumping into the much higher price brackets of pro video programs such as Apple's Final Cut Pro and Adobe Premiere.

Slick Volume 3

Thirty new title effects are the banner news in Volume 3. Some

effects make up for deficiencies in iMovie's built-in set; for example, the Headline title effect can produce larger type than Apple's similar Center effect. Even the more fanciful effects—such as Vellum, which curls like a transparent sheet of plastic across the screen, and Riptide, which makes words seem to rise from a pool of water—are subtle, not garish.

This trend also applies to Volume 3's transitions: Flap and Flop, for example, improve upon clichéd "page-curl" transitions by adding a slight flutter to some of the variations, and Ripple creates a realistic water effect. But don't think that GeeThree stuck to the high road—there's also an enjoyable and trippy transition called Psychadelia-Tie Dye.

Standouts in Volume 3's effects are color modifiers Color Tint and RGB Adjust, as well as Rotate/Scale, which can help realign horizons slanted by slightly crooked camera work. (One downside: rotating exposes the frame's black borders. They typically don't appear during TV playback, but it would be nice to have the option of zooming in enough to hide them.)

SLICK TRANSITIONS AND EFFECTS VOLUME 3

RATING: ★★★★★

PROS: New titles; high-quality rendering; useful transitions and effects.

CONS: Rotate/Scale effect exposes frame's black borders.

PRICE: \$50 each; both volumes, \$90 OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: GeeThree, 650/328-2359, www.geethree.com

Slick Volume 4

GeeThree calls Volume 4 the Hollywood Edition because it offers features typically found in professional-level applications. The Split Screen tool allows you to place two DV-formatted video clips side by side in a frame, and the Picture-In-Picture effect lets you create your own newscastlike scene—you can place a box con-

> continues on page 50

SLICK TRANSITIONS AND EFFECTS VOLUME 4

RATING: ★★★★★

PROS: Offers professional-level effects not otherwise available in iMovie.

CONS: VidMix effect doesn't cleanly knock out some colors.

DiskWarrior® has than



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NORTON ANTIVIRUS 8.0

Stalwart Virus-Protection Suite Comes to Mac OS X

BY STEPHAN SOMOGYI

Computer viruses are, unfortunately, a fact of life these days. And although we Mac users don't experience the onslaught of malware that folks in the Windows camp have to fight off, we're not invulnerable, and we mustn't become complacent. An antivirus program is a must.

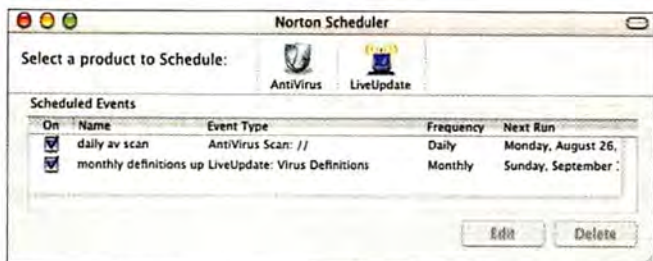
Symantec's Norton AntiVirus for Macintosh 8.0.2 is the first OS X-native release of this well-regarded protection tool, and in addition to OS X 10.1 support, this version offers improved scanning capabilities.

Norton AntiVirus provides multiple ways to track down viruses. It includes a scanner application and an invisible background process called AutoProtect, which looks out for viruses, alerts you when it finds

them, and stops them before they can propagate further.

AutoProtect is the first line of defense, but because it operates in the background and relies on a kernel extension (which is akin to a system extension in OS 9 and earlier systems), some users may prefer not to use it. If you fall into this group, you can also root out viruses with either the scanner application or the included `navx` command-line tool—useful for building Unix shell scripts, for example.

Version 8.0's most useful scanning feature is QuickScan, which remembers previously scanned files and will rescan them only if you've made changes to the file or if you've updated the virus definitions. Rescanning an already-scanned disk now takes only a fraction



Regularly Scheduled Checkups Norton AntiVirus 8.0.2's Scheduler allows you to plan updates and scans on a recurring basis.

of the time a first scan does. And unlike its predecessors, Norton AntiVirus 8.0's QuickScan also remembers already-scanned archives.

After installing AntiVirus 8.0, you should first ensure that the program's virus definitions are up-to-date. To this end, the program includes an OS X version of LiveUpdate, an application that queries Symantec and downloads new virus definitions—and software updates—as needed.

AntiVirus 8.0 also includes Scheduler, which lets you schedule regular antivirus scans to make sure no viruses have somehow sneaked onto your system. The software can alert

you when your virus definitions are more than a month old and then download updated ones for you.

One area where AntiVirus falls short is in the comprehensiveness of its virus definitions:

> continues on page 51

RATING: ★★★★★

PROS: QuickScan remembers already-scanned archives; command-line scanner included for automated scripting.

CONS: Scans only for Mac-affecting viruses, not for PC viruses; online help on OS X refers to OS 9 features.

PRICE: \$70; upgrade, \$40

OS COMPATIBILITY: Mac OS X

COMPANY: Symantec, 408/517-8000, www.symantec.com

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iPOD 20GB

Huge-Capacity Music Player Adds Cool Extras, Design Improvements

BY SIMON JARY

The pocket-size iPod is at the top of the digital-music-player market, and with Apple's addition of a 20GB model, its lead is widening.

Apple claims, fairly, that the 20GB iPod can hold approximately 4,000 songs compressed at 160 Kbps. And aside from music, you can use your iPod as a portable external hard drive, to view your contacts list, and to download your calendar for iPod viewing.

Both the updated 10GB iPod and the new 20GB iPod have a new touch-sensitive, static scroll wheel that's less vulnerable to dust, dirt, and breakage, because it has no moving parts. The 10GB and 20GB models' FireWire ports are also protected by a new built-in cover, which feels a little flimsy but does its job.

The 20GB iPod is about three-quarters of an inch thick and weighs 7.2 ounces, about one ounce heavier than its 5GB and 10GB siblings. To help you tote them around, the 10GB and 20GB models come with a carrying case and belt clip. Also included is a tiny wired controller you can clip onto your clothing; it lets you play, pause, fast-forward, or rewind a track, as well as adjust volume, without having to reach for the iPod itself.

All the new iPods come with improved headphones—even at medium MP3 compression, it's difficult to tell the difference between the iPod's audio and that of a standard portable CD player.

The iPod 1.2 software included with these models did occasionally get confused about the level of charge in the battery. Apple says that it is investigating the problem.

Macworld's Buying Advice

The 20GB model costs only \$100 more than the 5GB iPod did when it was first announced, so it's a bargain by comparison, especially given the cool extras that come with it. □

RATING: ★★★★★

PROS: Smart, compact design; fast sync speed; smooth solid-state scroll wheel; convenient wired remote control; tons of storage.

CONS: Slightly thicker than the 10GB model.

PRICE: \$499

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Apple Computer, 800/692-7753, www.apple.com



WORKSTRIP X

Dock-Replacement Utility Tries to Help You Get Organized

BY JEFFERY BATTERSBY

Designed to replace the Dock in Mac OS X, Softchaos's WorkStrip X attempts to bring order to the desktops of harried Mac users. Like the Dock, WorkStrip lets you launch applications with one click on an icon. And it lets you organize your files into Workspaces, which are great if you need to keep track of many projects. The program also remembers recently visited Web sites and recently created or edited documents.

Control-clicking on any program icon in WorkStrip opens a contextual menu that gives you access to files generated with that app. For example, the contextual menu for Microsoft Word lets you instantly preview your Word files.

You add items, such as folders, to WorkStrip either by choosing Keep In Strip from the pop-up menu of an active application or by dragging any item from the Finder to WorkStrip. Once you drop a folder on WorkStrip, you can easily navigate through its subfolders and select documents. Control-clicking on the folder displays a hierarchical menu that groups contents alphabetically by type and creator. (Oddly, you also remove items by selecting Keep In Strip, and you can't drag them off of the strip as you can with the Dock.) Clearly, WorkStrip provides you with numerous ways to systematize your work. But we would prefer a more streamlined, practical approach with more focused features. You *must* read the manual to use WorkStrip effectively, and even then, how to best use the program is not always apparent.

Macworld's Buying Advice

WorkStrip X promises simplicity and efficiency—but before it can deliver, you'll need to spend a significant amount of time setting it up and experimenting with its features. □

RATING: ★★★

PROS: One-click access to programs, files, and URLs; speedy, versatile preview feature.

CONS: Getting started is time-consuming; overwhelming feature set.

PRICE: \$39

OS COMPATIBILITY: Mac OS X

COMPANY: Softchaos, [44] (0)20 7434 0775, www.softchaos.com

> Slick Transitions and Effects

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taining other footage anywhere on the screen. With the Matte-tastic effect, you can anchor your logo (or any other image) to video, but because this effect lacks controls for placing your image, you must create a Photoshop-format file to fit the dimensions of the screen and position your image against a transparent background.

More ambitious is VidMix, GeeThree's method of achieving blue-screen effects. Using VidMix requires a peek at the PDF-based documentation so you can understand how each component works, but it's otherwise easy to learn. Like eZedia's similar eZeScreen plug-in, VidMix delivers mixed results, depending on your blue-screen source material (we used a sheet of colored poster board). Footage rendered in a 3-D or vector-imaging program tended to work better, due to those programs' solid-color backgrounds; real-life footage, although shot against a solid background, had shadows and variations that we were unable to remove completely.

Much better implemented is SlickMotion, a separate application for panning and zooming still images. As a stand-alone program, it offers an easily navigable interface for controlling the degree of zoom and the camera's position—as opposed to Virtix's plug-ins, which restrict you to operating from within iMovie's tiny preview pane. SlickMotion alone is almost worth the price of the entire Volume 4 package.

Macworld's Buying Advice

With the exception of the so-close-but-not-quite-there VidMix, Slick Transitions and Effects Volumes 3 and 4 offer iMovie 2 users at all levels a great combination of professional-looking effects that won't bust a production budget. Moreover, cost-conscious filmmakers will appreciate that Volume 4 alone includes most of the capabilities found in eZedia's and Virtix's offerings. □



Double Duty Slick Volume 3 offers new title effects for iMovie 2; Volume 4's picture-in-picture features are comparable to those in professional-level apps.

> Six Degrees

continued from page 37

ground while you work, and the entry in the Focus field reflects your every click. So if you return to the Legend after a time, you're likely to find new information there. This makes it hard to keep track of previous Six Degrees results. (Moreover, if you want to revert to a previous set of search results, expect to wait while Six Degrees runs the search again.)

However, there are two ways Six Degrees lets you solve this problem: First, you can click on the eyeball button in the interface to stop Six Degrees from building relationships—this closes the eye, indicating that the program is no longer keeping track of your movements. Second, you can create a Six Degrees “project,” a special Six Degrees-formatted file that saves your results so you can come back to them later.

Now, the Catch(es)

We'll just come right out and say it: Six Degrees is *slow*, which is problematic for a utility that purports to save you time. The program took too long to find results and slowed down our test machine, a 450MHz Power Mac G4 with 512MB RAM. (Don't even think of using it on a G3.) We spent a lot of time staring at the blue progress bar at the bottom of the results window, unable to quickly switch back into Entourage, Word, or any other program while Six Degrees worked. Even after we'd quit Six Degrees, or when it wasn't tracking our movements, Entourage was incredibly unresponsive. (Creo says that it's working to improve Six Degrees' performance and planning to release updates that should fix many of these problems in the near future.)

We had no trouble using Six Degrees with Office X documents, whose names readily appeared in the Focus field when we opened them. And the well-organized user guide states that Six Degrees works with Classic apps such as QuarkXPress 4.11 or 5.0 and Adobe Photoshop, but when we opened files of those application types, their file names often didn't appear in the Focus field. When we clicked on the files in the Finder, however, Six Degrees recognized them—an inconvenience Creo acknowledges in the included user guide.

Macworld's Buying Advice

Unless you're perfectly organized all the time (and who is?), you can probably make good use of Six Degrees. It makes connections more as a human being does and less as a machine does. Six Degrees is worth its \$99 price if your programs are compatible and if you're willing to sacrifice speed for its otherwise powerful file-finding and organizing capabilities. □

> QuickTime 6 Pro

continued from page 37

company's IT staff is unlikely to agree to uncork them at work.

A Change of Face

Apple has dispensed with QuickTime TV channels within QuickTime Player (the QTV menu is missing from QuickTime Player 6) and moved channels such as CNN, HBO, Disney, and the Weather Channel to Apple's Web site. In place of channels, you'll find buttons that link to additional Web content in the right side of the QuickTime Player window (see “A Word from Our Sponsors”). Besides being less useful than the channel links of old, the new links bear the distinctive scent of advertising.

Macworld's Buying Advice

Although QuickTime Player's interface is somewhat commercial in nature, the benefits of the AAC codec, MPEG-4 video, and Instant-On streaming (for those able to take advantage of it) make this one of the most compelling QuickTime upgrades in years for those with more than a passing interest in multimedia—and one well worth the paltry price of admission. □

> Norton AntiVirus 8.0

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it detects only viruses that can infect Macs, including macro viruses that affect Microsoft Office apps. Even though Macs are immune to PC viruses, they *are* sometimes unwitting carriers. Since Macs and PCs often coexist closely, it would be useful if the package detected PC viruses, especially those that are transmitted via e-mail. Likewise, this lack of detection is especially problematic for Mac-based users of Connectix's Virtual PC, who, for performance reasons, might not want to run a PC-based antivirus app.

In addition, version 8.0 has disappointingly OS 9-centric documentation. While the installation CD includes Norton AntiVirus 7.0 for OS 8 and 9, we found OS X content treated as the exception rather than the rule. This was particularly apparent in the online help.

Macworld's Buying Advice

With the exception of PC virus detection, Norton AntiVirus for Macintosh 8.0.2 provides the tools necessary to keep your Mac free of viruses. The responsibility for updating your virus definitions, however, remains with you. □

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WEATHERPOP ADVANCE 1.5

Glucose Development, www.glu.com; \$8

Some people ignore the weather, and others invest in remote-sensor thermometers, humidity and pressure sensors, and similar tools. WeatherPop, a tiny program that puts weather information in your Mac OS X menu bar, is definitely for the latter group.

A suitable companion to OS X's menu-bar clock, WeatherPop connects to the Internet to retrieve the latest weather data. Then it displays the current weather conditions at all times. When you click on WeatherPop, you can see an extended forecast for your city and other information. However, the data sources can be unreliable; WeatherPop recently stopped working for a week until its developers could release a new version. (Glucose says that it's updating WeatherPop to be more resilient to changes in how the software collects weather data.) Still, for anyone in a climate-controlled office who wants to see how things are shaping up outside, WeatherPop is simply addictive.—JASON SNELL

KENSINGTON STUDIOMOUSE

Kensington, 650/572-2700,
www.kensington.com; \$60

With its silver, white, and clear Lucite design, the Kensington StudioMouse looks right at home next to a new Power Mac G4 tower. The mouse's graceful but solid feel and well-designed MouseWorks software accommodate the fine control graphics pros crave.

The StudioMouse has three customizable buttons and, its new main attraction, a solid-state scroll sensor. Though the scroll sensor works smoothly (and it's recessed so you don't activate it inadvertently), it requires a bit more pressure than we'd expect. Pressing and holding the top or bottom of the scroll sensor lets you scroll continuously.

The StudioMouse's low profile does wonders to keep your palm and wrist in better alignment than mice with tall or bulbous palmrests can. But its white sides and scroll sensor show the accumulated gunk of everyday use a little too well for our taste.

The StudioMouse's simple, three-buttons-and-a-scroll-sensor configuration is suitable for anyone who wants to make a few productivity or ergonomic improvements to their routine but doesn't want a finicky, everything-but-the-kitchen-sink input device.

(Beware, OS X users: You should read the StudioMouse's compatibility caveats before you commit to it. The OS X-compatible MouseWorks 2.0 software is still in its early

adolescence, and many features available in version 5.7 for OS 8 and OS 9 are missing.)—JENNIFER BERGER

BRAVO EFFECTS AND ECHO TRANSITIONS

Virtix, 603/893-1682, www.virtix.com;
\$25 each or both for \$40



Virtix's Bravo Effects and Echo Transitions can add some sparkle (and smoke and lightning) to your iMovies. Of the two collections, Bravo's 20 effects are potentially the more useful. The One Color effect, for example, can replicate hand-tinted black-and-white photography by letting you control the amounts of red, green, and blue in an image. Bravo is also ideal for hallucinogenic dream sequences, with effects such as Sparkle, Spins, and Tunnel providing appropriate reality-bending imagery. The two most hyped effects, Laser and Lightning, create beams of light on a flat plane that extend outside the frame; however, we would have liked to see options for controlling the duration of the beams and some way to fire the laser between two points within the same frame.

Echo's 18 transitions range from a simple left-to-right Wipe to the subtle Fog and the *Scooby Doo*-inspired Dream. We're itching to find a good use for the Burn Through transition and the Stained Glass effect.

In terms of quality, all the effects end up rendering well, even in cases where the iMovie previews look cheesy, such as with the Rain effect.—JEFF CARLSON

WHO'S THERE FIREWALL ADVISOR 1.2

Open Door Networks, 541/488-4127,
www.opendoor.com; \$49; upgrade, free



When we reviewed Who's There Firewall Advisor for OS X (Reviews, February 2002), we noted that the firewall-log analysis tool supported only Symantec's Norton Personal Firewall. Version 1.2 offers the welcome addition of support for Mac OS X's built-in ipfw Unix firewall. Once an ipfw log is present and enabled, Who's There automatically reads and analyzes it. If a log isn't available, the program prompts you to activate one. This feature makes the process of getting Who's There up and running completely painless. And although it was initially impossible to use the software with popular firewall-configuration tools such as Brian Hill's BrickHouse (Reviews, March 2002), Who's There now provides an excellent complement to BrickHouse, as well as to an OS X server firewall.—SHELLY BRISBIN

PANTONE COLOR CUE

Pantone, 866/726-8663, www.pantone.com; \$349



Pantone's Color Cue, a cordless spectrophotometer the size of a flashlight, is designed to determine the closest Pantone equivalent to the color of a physical sample. Its built-in LCD tells you the closest Pantone match and provides a host of other color information.

When we used the Color Cue to take color measurements from a brand-new *Pantone Coated/Uncoated Formula Guide* swatch book (where the swatches are larger than 14mm in diameter), the device was accurate only 9 times out of 10, which isn't a convincing ratio.

The Color Cue lets you search for a specific Pantone color, using its three-button menu system, and retrieve the color equivalents in many other formats, but this feature was irritating to use—the menu system is about as friendly as, and somewhat less logical than, the voice-mail options presented by major government agencies.

The measurement aperture is also on the large side—14mm in diameter—making it nearly impossible to get an accurate reading for small samples, which must also be perfectly flat.—BRUCE FRASER

MACJOURNAL 2.1

Dan Schimpf Software,
<http://homepage.mac.com/dschimpf>; free



Dan Schimpf Software's MacJournal 2.1, a program that lets you create and modify virtual journals, is a model of utility and excellent application design. You can have an unlimited number of journals, and journal entries are organized by date and time. You can format entries to suit your needs, with options for text size, color, and font, as well as embedded graphic images. There's also a word-count tool, a spelling checker, and an incredibly useless but wickedly funny Taco feature that displays random quotes from *The Simpsons*. And though you can password-protect journals, you can't add them to your Keychain.

MacJournal lets you print any journal you create. And you can export a journal as text, RTF, or HTML—a great feature for the Weblog crowd—or e-mail it from within the program. The printed or exported journals won't include any added graphics—a minor, but irritating limitation. And the e-mailed entries don't fare well at all; all attempts to send a paragraph-long entry yielded an error message stating that the entry was most likely too big. (The company is aware of this problem, but it hasn't yet determined a viable solution.)—JEFFERY BATTERSBY

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Kinetic Arcade Fun, World War II Action, and Horror-Movie Chills

A Bountiful Harvest

AS THE WEATHER COOLS AND AUTUMN ARRIVES, IT'S TIME to spend more time indoors—and reap the benefits of a busy growing season in the Mac game world. From funky arcade games with cartoon colors and

a techno beat, to gritty World War II action-adventure scenarios, to a creepfest from a master of horror, there's more than enough in the silo to keep all of us well fed until next spring.

Pop Rocks

Whenever Ambrosia Software comes out with a new game, there's cause for both joy and alarm. Sure, Ambrosia's games are inexpensive and finely crafted, but they're also as addictive as a bowl of potato chips.

The company's latest offering, pop-pop, is no exception. It's the sophomore effort of developer Andrew Campbell, whose first Mac game was a delectable morsel of goodness called Battle-Girl. If you're familiar with Battle-Girl, some areas of pop-pop's design will seem familiar: a butt-shaking electronic soundtrack, psychedelic background sequences, and game play that's an homage to old-school arcade classics.

The game's brick-bashing mode will be familiar territory to all but the newest game players: You use a paddle positioned at the bottom of the screen to deflect a ball that pings wildly around your territory. Every time the ball strikes a brick, it smashes the brick to bits (except for some bricks that require more than one hit, and some that won't break at all). If you can clear your area of bricks, you win.

But pop-pop isn't derivative of old classics such as Breakout and Arkanoid, thanks to a huge twist that makes this game quite original: a Street



Pop Music Techno music, cartoon art, and addictive game play add up to Ambrosia's pop-pop, a winner of a game.

Fighter-style combat mode, in which you can challenge the computer or other players on the Internet (via Game-Ranger). You choose from several characters, each of whom has a special power that hinders an opponent's ability to effectively clear bricks. Mini T, for example, has Blow power, which pushes an opponent's paddle around with a great gust of wind. Zap creates sparks that repel an opponent's ball like a

fierce burst of static electricity. My personal favorite is Ducky, who has the power to fill an opponent's play area with rubber duckies.

That's not all. The bricks you bash are sent to your opponent's area to be cleared. If your opponent knocks those bricks down, they come back to you—twice as strong. Time and mistakes cause the bricks to descend closer to your paddle. If you can't clear them in enough time, you lose the round.

You've got more than just your special power to defend yourself with. Power-ups can give your paddle extra juice, allowing you to bash more than one brick at a time or send your field of bricks up a row. But, alas, there are also power-downs that can make your bricks descend a row, minimize the size of your paddle, or hold the paddle in place horizontally.

This frenetically paced game features animated characters cute and cuddly enough to merit their own line of T-shirts and plushy toys, and a thumping electronic soundtrack that makes you want to crank your speakers up a notch. What's more, the background of the playing field shimmers with a watery effect that's downright trippy. (You can turn it off if you find it too distracting.)

The Bottom Line At first glance, Street Fighter and Breakout may make very strange bedfellows, but >>

pop-pop's got a butt-shaking soundtrack and psychedelic arcade game play.

POP-POP

RATING: ★★★★★

PROS: Thumping music; trippy graphics; unique interface.

CONS: Special effects are distracting; complex game play.

PRICE: \$25

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Ambrosia Software, 716/325-1910,

www.ambrosiasw.com

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Violence



THE GAME ROOM

somehow, Ambrosia and Andrew Campbell have managed to fuse the two into an ingenious (and occasionally hallucinogenic) action game that's worth your attention.

Heavy Medal

The Nazi menace has been constant fodder for gaming over the years, and now and then there are interesting twists on the theme—for example, *Return to Castle Wolfenstein* (*The Game Room*, August 2002) threw zombies and weird otherworldly monsters into the mix. But Aspyr's new *Medal of Honor: Allied Assault* is a more traditional (and historically accurate) example of the Nazi-hunting genre.

Medal of Honor: Allied Assault is a first-person shooter, but it's significantly more complicated than simply barreling in with both guns ablaze—that will often lead you to instant defeat. Each mission has a goal, whether it's stealing documents, planting bombs, or otherwise thwarting the efforts of your Nazi nemeses. You're given an arsenal of varied weapons to use to accomplish each mission, as well as limited amounts of ammunition and other resources that you must carefully manage.

You're outfitted with true-to-life rifles, sidearms, grenades, and other gear that will help you. Obviously, some aspects of reality have to be modified a bit to keep the game play interesting—such as instant recovery, thanks to health packs and canisters you'll find along the way—but an extraordinarily detailed graphics engine and realistic sound effects help immerse you in this reality.

Once you've completed *Medal of Honor: Allied Assault*'s single-player mode, you'll find a wealth of opportunity to play



My Own Private Ryan Join forces with your buddies and go on important missions in *Medal of Honor: Allied Assault*.

online. Powered by the Gamespy game-finding service, *Medal of Honor* servers abound on the Internet. Some of these servers sport free-for-all deathmatches; others feature team-based game play that requires you to play a specific role on a team in order to reach an objective.

Single-player and multiplayer modes alike often depend on your listening for cues that tell you where your enemies are. The sound effects in *Medal of Honor* are terrific—but they don't distinguish left from right as clearly as some other Mac games do.

The Bottom Line Great graphics, detailed and challenging missions, and varied multiplayer modes keep *Medal of Honor: Allied Assault* interesting for hours. The lack of 3-D audio is a drawback, though, especially in multiplayer games.

A Day at the Beach

Long before video games were all the rage, shooting galleries were an arcade staple. Taking up a toy rifle and aiming at targets was a simple pleasure. When I play MacSoft's *Beach Head 2002*, that's what I think of: simple, repetitive fun.

And apparently, I'm not alone. The game's predecessor, *Beach Head 2000*, was one of MacSoft's more popular games targeted at casual gamers—despite some absolutely scathing reviews when it appeared on the scene. There's just something mindlessly addictive about solely occupying a bunker on a nondescript beach someplace as hordes of invaders charge your position, begging to be mowed down by your array of powerful weaponry.

Beach Head 2002 hasn't strayed too far from the original: it's more of the same old fun. Soldiers charge your bunker position

MEDAL OF HONOR: ALLIED ASSAULT

RATING: ★★★★★

PROS: Detailed graphics; real-life World War II missions and weapons.

CONS: Lack of 3-D audio causes misleading audio cues.

PRICE: \$50

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Aspyr Media, 888/212-7797,

www.aspyr.com

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THE GAME ROOM



Shooting Gallery See the targets, shoot the targets—that's pretty much what you get with MacSoft's *Beach Head 2002*.

on foot—under the protection of armored personnel carriers—or parachute from transport planes overhead; it's up to you to nail them before they make it to you. Meanwhile, you'll have to contend with tanks, jets, helicopters, and other nasties as they take aim at you. To dispel each wave of attackers, you use various weapons ranging from guided missiles to your trusty sidearm—all of which are equipped with limited amounts of ammunition that you must use sparingly.

Unfortunately, the game's response to mouse commands is slow and sloppy.

And I often had to completely disregard the game's crosshairs in order to line up my shots, as I would fire under or over the target, even though it looked as though I had lined up the shot perfectly.

Firing at everything that moves is about as complicated as *Beach Head 2002* gets. This is no *Medal of Honor: Allied Assault*, but for \$20, my expectations were a bit more modest.

The Bottom Line Sometimes you want a game that challenges you, and sometimes you want a game that's just mindless fun. For those mindless moments, *Beach Head 2002* can certainly fill the void.

BEACH HEAD 2002

RATING: ☹☹☹

PROS: Mindless arcade-style fun.

CONS: Gets old fast; sluggish input-device response.

PRICE: \$20

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: MacSoft, 800/229-2714, www.wizworks.com/macsoft

Mac Speakers Make Some Noise

No decent Mac gaming system is complete without top-notch speakers. Even more than game controllers or other gadgets, speakers bring games to life. Without dropping a huge amount of cash, you can turn your Mac into a great stereo system. Here's a look at some 2.1 audio configurations—in other words, two satellite speakers combined with a subwoofer.

Arguably the most attractive sound system for the Mac is the venerable Soundsticks system from Harman Multimedia (www.harmanmultimedia.com). These things really were made for the Mac. They plug into your Mac's USB port and pump out audio through a trick subwoofer, paired with two minitowers that are each equipped with four one-inch speakers made out of clear plastic material. Of all the systems I've seen, these look the best with my Macs—but they're weak at reproducing midrange sound, and at \$200, they're pricey.

Another Harman offering is the JBL Creature. At \$130, they're less expensive than the Soundsticks, but sonically they're quite similar. The difference is that the Creature's satellite units have only one speaker instead of four, though they sound very rich. Unlike the Soundsticks, the Creature uses your Mac's headphone jack instead of USB—admittedly, a more primitive way of connecting, but it's a way less prone to USB-related problems and more compatible with other non-Mac devices. The Creature is molded in gray, white, or blue, so you can match your speaker set to your Mac's decor, too. It even casts an eerie glow on your desktop—a nice sci-fi touch for your Mac gaming setup.

Level 9 Sound Designs (www.monsoonspeakers.com) brings up the rear with two sets of low-priced but well-configured 2.1 systems—the \$100 PlanarMedia 9 and the \$80 PlanarMedia 7. Their boxy look is more utilitarian than that of the Harman Multimedia speakers, but what PlanarMedia's speakers lack in cosmetic appeal they more than make up for in sound quality. Both systems feature beefier subwoofers than the Harman systems do—just the thing to get your booty shaking during a late-night pop-pop session.

The JBL Creature



Bump in the Night

Technical snafus set last year's release of Clive Barker's Undying, from Aspyr Media, way back. But this game is worth the wait.

This period action game is set in the 1920s, when Great War veteran and expert of the supernatural Patrick Galloway is summoned to the ancestral Irish estate of his war buddy Jeremiah Covenant.

With his siblings dead, Jeremiah is the last living remnant of the Covenant clan. But the mansion and its grounds are far from quiet—alas, Jeremiah's brothers and sisters have returned from beyond the grave in an attempt to free the Undying King. To this end, they haunt the ancestral grounds with fearsome and horrific creatures from the netherworld. As if that weren't enough, Galloway must also square off against Otto Keisinger, a fierce rival on his own quest for ultimate supernatural power.

Horror author Clive Barker was instrumental in the creation of Undying; he even contributed his vocal talents to the game. Barker's rich and descriptive prose has been fertile ground for visual entertainment over the years—horror-movie franchises *Hellraiser* and *Candyman* are based on his works. It's natural, then, that Barker would extend his reach into computer games. If you're fond of Barker's macabre visions, you'll love Undying. It's the ideal game to play late at night with the volume up and the lights down—you'll jump out of your seat.

The game is a first-person shooter. As Galloway, you must unravel the curse and the undead Covenant siblings' sinister plans before they do in your friend Jeremiah and unleash horrors upon an unsuspecting world. To that end, you're armed with devices both mystical and mundane—your trusty military-issue revolver, for example, is just the thing to use against an errant Howler before it slashes you apart and feasts on your viscera. The Gel'Ziabar Stone, which glows bright green whenever mystical energies are nearby, lets you more fully understand what's happening around you.



Creepshow Easily spooked? Play Clive Barker's Undying, and it won't be long before you're jumping out of your seat.

Undying's visual quality is modestly diminished by the age of its underlying Unreal Tournament engine, and frequent level loading forces you to pause abruptly in the middle of your explorations. But technology limitations aside, the game's designers have done a phenomenal job of creating a genuinely frightening atmosphere. Dynamic music and sound effects complete the immersion into this otherworldly game.

I experienced a few random lockups and crashes while playing the game in OS X; I learned quickly to save my game frequently, and I'd recommend that other Undying players do the same.

The Bottom Line Ever yelled out, "Don't go in to that darkened room!" to the protagonist in a horror movie? You'll find yourself doing the same thing here—but this time, you're that hero, unable to resist the compulsion to visit those darkened recesses, even though it's your own neck that's at risk. □

CLIVE BARKER'S UNDYING

RATING: ★★★½

PROS: Frightening environments and critters; engrossing story.

CONS: Old graphics engine; occasional crashes; frequent level-load breaks.

PRICE: \$30

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Aspyr Media, 888/212-7797,

www.aspyr.com

Blasting demons, repelling invading armies, and infiltrating Nazi strongholds is all in a day's work for MacCentral.com Senior Editor PETER COHEN, who likes to relax in the tub with his rubber ducky, Fred.

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TAME JAGUAR



BY DAVID POGUE

Overwhelmed by the
Latest Mac OS Update?
Get More Productive
with These OS X 10.2 Tips.

A JAGUAR IS A BIG CAT—fast, powerful, and beautiful to watch. But if you're not careful, it'll have you off balance in the blink of an eye. The same goes for Apple's Jaguar, Mac OS X 10.2.

The latest Mac OS is reportedly loaded with more than 150 new features. At least a few of them are visual touch-ups: the spinning "wait" cursor is fancier, there's a new screen-saver module, and you can now make your desktop picture change automatically at regular intervals. But you didn't shell out \$129 (not to mention the money you paid for your Mac) to stare at your desktop all day.

Fortunately, the new features also include some hum-dinger productivity boosters. Here's a guide to making this wild animal work for you, not against you. (For troubleshooting tips, see "Troubleshooting Jaguar.")

Find It Faster

How much time do you waste rooting around in your folders, trying to find certain files? One of Jaguar's biggest productivity boosts comes from Apple's radical redesign of the way we search. In fact, you now have two different tools for this purpose—and *neither one* is Sherlock. (Sherlock now does nothing but search the Web.)

The Search Bar The Search bar is especially convenient because it's at the top of every Finder window and always ready for action. After 18 years, the Finder has finally earned its name! If you don't see this little round-ended box, make sure your Finder toolbar is visible (press ⌘ -B) and wide enough to expose it. Also, make sure your toolbar isn't in Text Only mode—look under View: Customize Toolbar and double-check the Show pop-up menu.

ILLUSTRATIONS BY WWW.JSDYKES.COM

TROUBLESHOOTING JAGUAR

It's awfully hard to be productive when your computer doesn't work. Here's how to deal with problems you may encounter after upgrading—there are new features that can help.

Soothe Ownership Pains Changes in the Finder's Info window (⌘-I) make it easier to solve one of OS X's most common and frustrating problems: error messages that say, "You do not have sufficient access privileges" (typically, to open, move, or delete a file).

To remove most of these roadblocks, you need to make yourself the file's owner and then enable Read & Write access. (Just remember that some files—such as ones in the System directory—are usually best left alone.) It sounds simple. But how do you make this change?

The Privileges pane in OS X 10.1's Info window listed a file's owner and group assignments, but it provided no way to modify the settings. To do so, you needed to use Terminal or a third-party utility such as XRay (\$10; www.brockhoff.net/xray/). In Jaguar, you can open an item's Get Info window and change its owner there. Click on the Ownership & Permissions triangle and, when the options appear, click on the padlock to unlock access to the needed settings. Finally, from the Owner pop-up menu, change the owner to yourself. You can now also change the owner's access settings here.

Patch Up Permission Problems Being able to change ownership and access settings from the Get Info window is great—as long as you know which file needs fixing and what the changes should be. This isn't always easy to figure out. For example, if a Type -192 error occurs while you're trying to mount a disk image, you may not immediately think, "Aha! A permissions error." But that's most likely what it is.

Jaguar helps out here, too. Launch Disk Utility (Applications: Utilities) and select the First Aid tab. Then select the current start-up volume. You'll see two new options: Verify Disk Permissions and Repair Disk

Permissions. If you click on the Verify button, First Aid generates a list of permissions errors and what the correct settings should be. Click on the Repair button to fix the errors. You can accomplish a similar feat in OS X 10.1.5 via Apple's Repair Privileges utility (available for download from <http://docs.info.apple.com/article.html?artnum=106900>). This utility restores the default privileges settings of all Apple-installed software. Unlike First Aid, it has no option for viewing changes before they're made. In any case, the current 1.1 version of Repair Privileges doesn't work in Jaguar, so First Aid is the only choice for Jaguar users.

Install without Fear The updated version of the Installer utility in Jaguar resolves an especially irksome issue. Suppose your OS X 10.1.5 start-up volume became so messed up that you wanted to completely reinstall your operating system.



You get out your OS X Install CD, which most likely contains an older version of OS X. This means that reinstalling will temporarily downgrade you. Even if the Installer permits this "downgrade upgrade" (which it often will not), Apple strongly advises against it, stating that if you need to reinstall an earlier version of OS X, you should choose the erase option in the OS X Installer.

Jaguar's Installer includes a new archive option that will save you from having to erase your drive in such situations. Similar to a "clean reinstall" in OS 9, archiving moves the currently installed software to a folder called Previous Systems. (Once the system is there, you can't boot from it.) Then a completely fresh copy of Jaguar is

installed. To do this, select the desired volume in the Installer's Select A Destination screen, click on the Options button, and select Archive And Install rather than Upgrade Mac OS X.

Watch Out for Software Conflicts Jaguar has a lot to offer, but be prepared for numerous software conflicts after you upgrade. Symptoms may include crashes of login items at start-up, application-launch failures, and application features that no longer work as expected. In most cases, you can resolve problems by updating the offending third-party software (usually available from the company's Web site).

Certain items that load at start-up (as listed in the Login Items System Preference pane) are particularly prone to break in Jaguar. For example, Palm's Transport Manager crashed often in my tests. Removing these items from the Login Items list is your best bet until updates are released.

Also, third-party software that adds an item to the right side of the menu bar will no longer work—Apple added a restriction in Jaguar that prevents these from appearing. If you want to override this, install Menu Extra Enabler (free; www.unsanity.com/download.php?product=mee). Using this tool, I was able, for example, to resurrect Aladdin's Magic Menu.

Speed Up Help Other problems may be caused by files that carried over from OS X 10.1 and now reside in your Home directory (~). For example, if Help Viewer crashes on launch or is unusually slow, try deleting aliases to third-party Help files, as found in ~: Library: Documentation: Help and ~: Library: Preferences: Apple Help Prefs. Also delete the com.apple.help.plist file in ~: Library: Preferences if you have such a file.

Look for Updates Jaguar may cause problems with some external hardware (such as a CD-RW drive that fails to show up in iTunes or Toast). Problems with SCSI cards and devices are likely. Fixing these conflicts will typically require a driver and/or firmware update from the company. But in some cases, you may need to wait for Apple's next Jaguar update.—TED LANDAU

To use the Search tool, open the window where you want to search—the tool will look in this window *and* in all the folders it contains. Click in the Search bar, type a few letters of the name of the file or folder you want to find, and then press return or enter.

You can manipulate the list of search results much as you would a list of files in a standard Finder list-view window. For example, you can highlight multiple items simultaneously: highlight all of them by choosing Edit: Select All (⌘-A), highlight individual items by ⌘-clicking on them, drag diagonally to enclose a cluster of found items, and so on. You can even rename something right in this list—click on its name, wait for the renaming box, and type. You can jump to the actual item, wherever it happens to be sitting on your hard drive, by highlighting it in the list and pressing ⌘-R.

You can also manipulate these results as you could in the Sherlock of old: open something by double-clicking, move it by dragging out of the window, copy it by option-dragging out of the window, make an alias of it by ⌘-option-dragging, and so on. If you'd like to repeat the search using a different search phrase, click on the Back button in the toolbar, or press ⌘-[(left bracket), to return to the window where you began.

The Find Command The Search tool is simple, fast, and convenient. But it's not the most powerful search program on earth. It looks only for files' names, not their sizes, dates, and so on. And it can't look for words *inside* your files.

For these purposes, you need OS X's new file-finding tool, Find. To get started, choose File: Find (or press ⌘-F). Specify where you want to search—for instance, Everywhere (on your Mac, network, or connected Internet disks) or Specific Places (drag disk or folder icons into the list or click on Add). Then indicate what you want to find.

The first boxes you'll see—File Name and Content (that is, words inside the files)—are only starting points. In all, Find lets you define a search with as many as eight criteria: name, contents, date modified, date created, visibility, kind, file size, and extension (such as .jpg). To narrow your search, choose from the Add Criteria pop-up menu at the bottom of the Find window. To delete a row from the Find window, click on the - (minus sign) button at the right side of the window.

But that's just the beginning. To the delight of propeller heads around the world, OS X 10.2 introduces AND searches. That is, you can add certain criterion rows (file name, date created, and date modified) to your Find setup *more than once*, for even more-specific searches.

To find files you created between two specific dates, for example, you could set up two "date created" rows, one that specifies the starting date and one for the ending date. Just add one criterion row of the appropriate type, and then click on the + (plus sign) button at its right end. You get a duplicate row. For

Speedy Keyboard Shortcuts

Learning keyboard shortcuts is the best way to steal back minutes of your day and protect your arms from repetitive strain injuries. After all, the time you spend reaching for the mouse and clicking through menus adds up. If you do only one thing to make yourself more efficient, pick a few of these shortcuts and commit them to memory.

KEY COMBINATION	RESULT
Start-up Keystrokes	
C	Starts up from a CD.
D	Starts up from the hard disk's first partition.
N	Starts up from the network server.
T	Puts the Mac into FireWire Target Disk mode.
X	Starts up in OS X (if OS 9 is on the same disk).
shift	Prevents start-up items from opening.
option	Shows icons of all start-up disks or partitions, so you can choose one for start-up (older machines: restarts in OS 9).
⌘-option-shift-delete	Starts up from an external drive (or CD).
⌘-V	Shows Unix console messages during start-up.
hold mouse button down	Ejects a stuck CD or DVD.
Finder Keystrokes	
⌘-option-W	Closes all Finder windows.
⌘-up arrow	Opens the parent folder.
⌘-option-shift-up arrow	Selects the desktop.
tab	Selects next item alphabetically.
shift-tab	Selects previous item alphabetically.
⌘-shift-H	Opens your Home folder.
⌘-shift-A	Opens your Applications folder.
option-click on the Minimize button	Minimizes all Finder windows.
General Keystrokes	
⌘-tab	Switches to the next open program—press once and release the ⌘ key to switch to the program you used most recently.
⌘-shift-tab	Switches to the previous open program.
⌘-~ (tilde)	Switches to the next open window in this program.
option-Empty Trash	Empties the Trash without asking, "Are you sure?" (Also nukes locked files.)
⌘-option-D	Hides/shows the Dock.
⌘-click on a Dock icon	Reveals the original item in the Finder.
⌘-option-click on a Dock icon	Switches to this program and hides all others.
⌘-option-H	Hides all windows except the one you're in.
On Keyboards without a Power Key	
control-eject	Brings up the dialog box for shutdown, sleep, or restart.
⌘-control-eject	Forces a restart.
⌘-option-eject	Puts the Mac to sleep.
⌘-control-option-eject	Shuts down.

instance, if you wanted to find notes about your first impressions of Jaguar, you could make one row that looked for files created after August 24 and another that looked for files created before September 1.

Get Informed

Who can fathom the mysteries of Apple's brain? Lo and behold, the Show Info command of OS X 10.1 has morphed back into the Get



Take keyboard shortcuts one step further with CE Software's \$80 QuicKeys X 1.5.3 (800/523-7638, www.cesoft.com). See "Streamline Your Routines," *Secrets*, June 2001, for ideas.

Info command of OS 9—but with some welcome changes that can improve your efficiency.

A Distinguished Panel If you click on an icon and then choose File: Get Info (or control-click on an icon and choose Get Info from the contextual menu), you open a collapsible, multi-panel screen that provides a wealth of information. For example:

- For a disk, you get statistics about its capacity and how much of it is full—a handy gauge that helps you decide whether it might be time for a house-cleaning binge.
- For a document, you get to see when it was created and modified and which programs it “belongs” to—useful when you’re trying to figure out why a JPEG file is opening in OS X’s Preview instead of in Adobe Photoshop, for example.

- If you open the Get Info window when *nothing* is selected, you get information about the desktop itself, including the amount of disk space consumed by everything sitting on it. As a result, you can use the desktop itself as a loading dock for, say, a CD you’re about to burn, using Get Info to make sure you haven’t exceeded its maximum capacity of 650MB.

- If you choose a gaggle of items all at once, the Get Info window shows you precisely how many you highlighted, breaks them down by type (“23 documents, 3 folders”), and totals their file sizes for you. This is a great opportunity to change certain file characteristics on a lot of files at once, such as locking or unlocking them, hiding or showing their file-name extensions, changing their ownership or permissions, and so on.

Uniwindow versus Multiwindow In OS X versions 10.0 and 10.1, a single Info window remained on the screen as you clicked on one icon after another. That reduced clutter but didn’t let you compare the folders’ statistics side by side. OS X 10.2 returns to

the old way: a new dialog box appears each time you press \mathbb{H} -I. But the uniwindow approach is still available. Highlight the icon and press \mathbb{H} -option-I (or hold down option and choose Show Inspector from the File menu).

Control Classic

However much Steve Jobs would like us to believe that OS 9 is dead, most of us still spend at least some of our lives working in it, either by restarting a Mac in OS 9 or by using an application in OS X’s Classic mode. Fortunately, all of this is much easier in OS X 10.2.

Choose a Specific System Folder

Folder In the dusty days of OS X 10.1 and earlier, everyone who used a particular Mac had to use the same copy of OS 9 as the basis of the Classic experience. It was just too bad if each user wanted to use different fonts or to set up preferences in a particular way—they’d have to reset these each time.

In OS X 10.2, you can open the Classic panel of System Preferences and choose any OS 9 System Folder you like. It doesn’t have to be the same one your boss, parent, sibling, or kid uses.

One-Key Switching between 9 and X The prescribed way to switch between systems is only slightly less tiresome than filling out the 1040 tax form: open System Preferences, click on Startup Disk, click on the OS 9 System Folder you want to restart from, click on Restart, and then click on OK. Going back to OS X in the opposite direction is just as tedious.

Fortunately, there’s a brilliant, timesaving shortcut. When you’re in OS 9 and want to restart the machine in OS X, just restart as usual—and hold down the X key. After a couple of screen blinks, you’ll find that the Mac starts up in OS X as usual. (Be forewarned that this trick works only if OS 9 and OS X are on the same hard drive.)

The only downside to the X-key trick is that it’s one-way. You can’t, for example, hold down the 9 key to restart in OS 9—at least not if OS 9 and OS X are on the same drive. If you’ve installed OS 9 and OS X on two different drives or partitions, though, there is a trick that can help.

Make sure OS 9 is on the *first* partition, and leave OS X as the start-up disk. When you want to duck back into OS 9, hold down the D key just after the start-up chime, and your Mac will start up in it. As it



As in older versions of Mac OS, you can press \mathbb{H} -tab to move through open programs. But in OS X 10.2, a single press of \mathbb{H} -tab instead takes you to the program you used *most recently*. This saves you from \mathbb{H} -tabbing your way through all open programs in the Dock just to “get back” to the one you really want.

turns out, the D key tells the Mac to start up from the first internal disk or partition that contains a working System Folder of any type. If it's an OS 9 partition, then that's what you get. To return to OS X, just restart the machine without holding down any keys at all.

There's one more trick that saves time when you're going between OS 9 and OS X if you've installed each operating system on a different disk or partition (it may not work on the oldest OS X-compatible machines, however). Press the option key as the Mac starts up. You'll see the icon of each disk or partition. Click on the one you want (OS 9 or OS X), and then click on the continue arrow.

Look at Things a Different Way

You might not think that some of the cosmetic touch-ups in OS X 10.2 could help you work more efficiently, but think again.

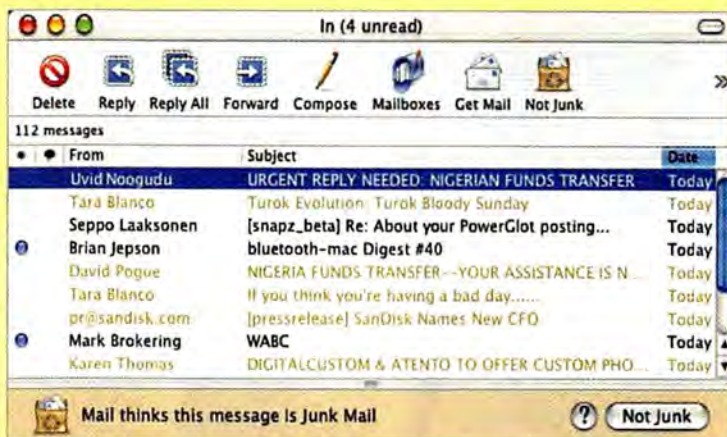
Just Your Type As Apple's screen resolutions go higher and higher, on-screen type gets smaller and smaller. If squinting slows you down, you'll appreciate a feature never before available in Mac OS or Windows: you can now adjust the type size for item names on a window-by-window basis.

Open the window where you want to enlarge (or shrink) the font. Then choose View: Show View Options (or press ⌘-J). At the top of the window, click on either This Window Only or All Windows, and then use the Text Size pop-up menu. Why would you want to adjust the font size in different windows? In crowded list views, you might want smaller type so you can fit more into a single view and thereby avoid scrolling. In windows that are less densely populated, you can afford to make the type easier on the eyes.

Icons of Your Own OS X 10.2 offers a couple more ways to streamline your desktop. File names can appear *beside* full-size icons rather than beneath them. In effect, you get a multicolumn list view with all the benefits of the icon view, saving you a lot of scrolling and hunting.

Furthermore, folders can now tell you how many files they contain. Also, most graphics files tell you their size, in pixels, and audio and video files can tell you how long they are, in minutes and seconds. Often, that's just enough extra information to help you pick out the right file or folder—and save you a bunch of extra clicks (see “Side by Side”).

To use these options, open an icon-view window. Choose View: Show View Options. Under the Label Position heading, select Right to put the name of each item beside its icon. Then turn on Show Item Info. Next to each icon, a new line of information appears in blue type. It will tell you how many files are inside a folder or give the specs of most graphics, audio, or video files. This trick doesn't work for every file format—for instance, JPEG graphics or Real Audio files. But it does work across a network, even when you're looking at files on a Windows machine.



The Spaminator Train Mail's new antispam feature by flagging messages as Junk or Not Junk during the first weeks of use. When it seems accurate, switch to Automatic mode. That way, these brown-labeled messages won't appear in your in-box at all.



Side by Side Use the new View Options features (left) to summon a line of blue text that identifies the length of an audio or video file, the number of items in a folder, or the dimensions of graphics files in any format except, for some reason, JPEG. (Apple says it's a bug.)

Maximize Apple Mail

Most of us spend much of the day sending and receiving e-mail messages, so any improvements to our e-mail client can add up to a lot of time saved.

Many of the improvements in OS X's built-in Mail program are tiny tweaks: for example, you can control-click on almost anything for a pop-up menu of useful commands, a little orange symbol next to a name lets you know when one of your iChat buddies is online, and Mail remembers the positions of your open windows.



You don't have to leave iChat open to get instant messages or know if buddies are online. Open the iChat preferences and deselect When I Quit iChat, Set My Status To Offline. Now your iChat menu bar will remain active, and you'll stay online even when you quit the program itself.



There's more to OS X 10.2 than meets the eye. Some small tricks don't fit neatly in any category but are useful nonetheless. Here are ten quick Jaguar tips that will make your Mac more productive (or at least more fun to use).

10 QUICK TIPS

1. In OS X 10.2, you can lock your Mac from the menu bar. Just launch Keychain Access (found in the Utilities folder) and select Show Status In Menu Bar from the View menu. To lock your Mac, choose Lock Screen from the Lock menu that appears in the menu bar. Your Mac will instantly display the currently chosen screen saver, which can't be revoked until you enter your login password.
2. To cycle through views in many OS X 10.2 application toolbars (Mail and Preview, for example), command-click on the Toolbar button (the transparent button in the upper right corner of a document window). Once you do, you can cycle through the following toolbar views: Large Icon And Text, Small Icon And Text, Large Icon Only, Small Icon Only, Large Text Only, and Small Text Only.
3. Need to see an Address Book contact's phone number from across the room? Open OS X 10.2's Address Book, select a contact, click and hold on the Phone heading next to the phone number, and select

Large Type—the number appears in gigantic type across your screen. To see such large numbers in Calculator, control-click on the total and select Large Type.

4. Don't miss the Calculator utility's impressive productivity boosters. It not only sports a "paper tape," so you can view past calculations, but also performs conversions (via the Convert menu)—including speed, volume, and temperature. It can even convert currency and download the latest currency rates from the Internet—select Convert: Update Currency Exchange Rates. (What happens if you don't have a constant connection to the Internet? Your Mac will dial your ISP if it's configured to do so when an Internet connection is requested.)

5. Do you want to use your scroll-wheel-equipped mouse to move through windows horizontally instead of just vertically? Can do—in Finder windows and Microsoft Excel X. Hold down the shift key and move the wheel down to scroll to the right and up to scroll to the left. In Microsoft Word, hold down the control key and scroll to zoom in and out of the document.

6. Place helpful commands at your fingertips by double-clicking on the Script Menu.menu item inside the Application folder's AppleScript folder. Doing so adds an AppleScript menu with more than 70 scripts to OS X 10.2's menu bar. For instance, from here you can attach a script to a drop-box folder that causes an alert to appear each time a coworker adds a new item to that folder.

7. Speaking of AppleScript, you can download even more scripts to add to OS X's Toolbars from www.apple.com/applescript/ toolbar. A particular favorite is the Snapshot script that can memorize and restore a particular Finder window configuration.

8. When is a user not a user? When it's a project. You can easily archive projects in OS X 10.2 by creating a new user, assuming that user identity to create a project—a newsletter or Web site, for example—and then deleting that user. When you do, all the files within that user's folder are placed in a single disk image (.dmg) file inside the Deleted Users folder in OS X's Users folder (Computer: Users: Deleted

Users). Should you need these files at a later date, simply double-click on the .dmg file to mount its image and grab the files you need. Yes, you could copy the entire Users folder to archive it, but this is faster and a bit tidier.

For example, your next Macintosh users' group newsletter could be a "user." Just launch the Accounts System Preference and click on the New User button. In the resulting sheet, type a name and a password for the user. If you'd like those working on the newsletter to have administrative privileges, select the Allow User To Administer This Computer option. Once you've wrapped up the newsletter, delete the user (project) and find all the files tied up in a neat package—in a .dmg file.

9. To take a screen shot of a particular object—an open window or an active menu—press ⌘-shift-4 and then the spacebar. The cursor will change to a camera. Place it over the object you want to capture (selected objects turn light blue) and click your mouse button. The screen shot is saved as a PDF file on the desktop.

10. And finally, one antiproduktivity tip: Make your OS X 10.2 desktop come alive by replacing your desktop picture with a running screen saver. To do so, open the Screen Effects system preference and choose a screen effect. Open Terminal and type `nice +20 /System/Library/Frameworks/ScreenSaver.framework/Resources/ScreenSaverEngine.app/Contents/MacOS/ScreenSaverEngine -background &`.

Then press return to make the active screen saver your desktop picture. When you press return, a number will appear in the Terminal window—it follows [1]. This number is the process you just invoked. To turn off this effect, type `kill` and the process number—`kill 541`, for example. Note that using a screen saver as a background will affect the performance of even the fastest Macs. The `nice +20` portion of the command tells the OS to give its attention to other processes when necessary. For better performance from the effect, don't include `nice +20` in the command.

To see this trick taken to its full potential, use it with the \$22 SereneScreen Marine Aquarium (www.serenescreen.com).—CHRISTOPHER BREEN

Using the Junk Mail Filter But surely the most talked-about item is the new Junk Mail filter. You'll see its effects the very first time you check your messages: a certain swath of message titles appears in color. These are the messages that Mail considers junk.

Your job is to supervise Mail's coloring job. If you get spam that Mail misses, click on the message and then click on the Junk button at the top of its window (or the Junk icon in the toolbar). If Mail flags legitimate mail as spam, swat it gently on the nose and click on the Not Junk button. Over time, Mail filtering should improve (see "The Spaminator").

The only trouble with this so-called Training mode is that you have to trash the spam yourself. Once Mail perfects its filtering skills, choose Mail: Junk Mail: Automatic. From then on, Mail will automatically file spam in a Junk mailbox, where it's easier to scan and delete the messages en masse. (It's never a good idea to send messages directly to the Trash. Legitimate ones could be caught by accident, and you'd never know.) Voilà: the time you used to spend manually deleting messages titled "Make \$1,000 by Salting Crackers in Your Own Home!" is yours again.

By editing the Junk rule, or filter, you can make the sieve more or less restrictive. For example, you could click on the + (plus sign) button next to one of the conditions for the junk mail and then choose Account from the new pop-up menu: the filter would apply only to one of your e-mail accounts. To learn more about getting the most out of filters, see "Stop Spam!" *Secrets*, August 2002.

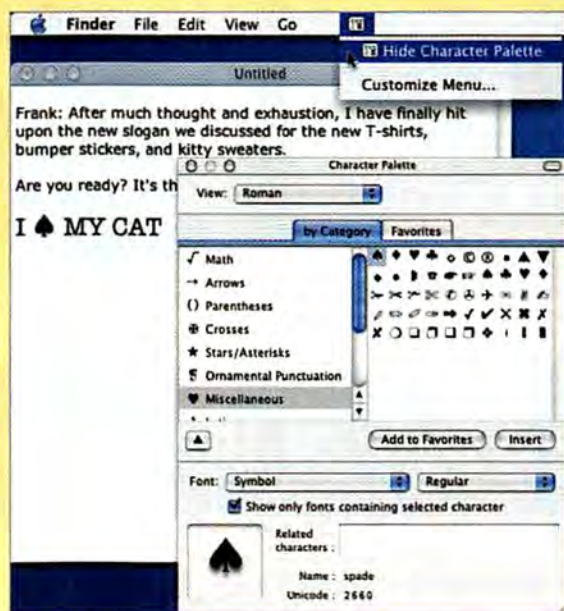
Stop Fumbling for Fonts

You've been hired to design a brilliant new bumper sticker for the ASPCA. With only minutes before the deadline, it hits you: "I ♠ My Cat." Only one thing stands between you and a well-deserved promotion: finding a gosh-darned ♠ symbol.

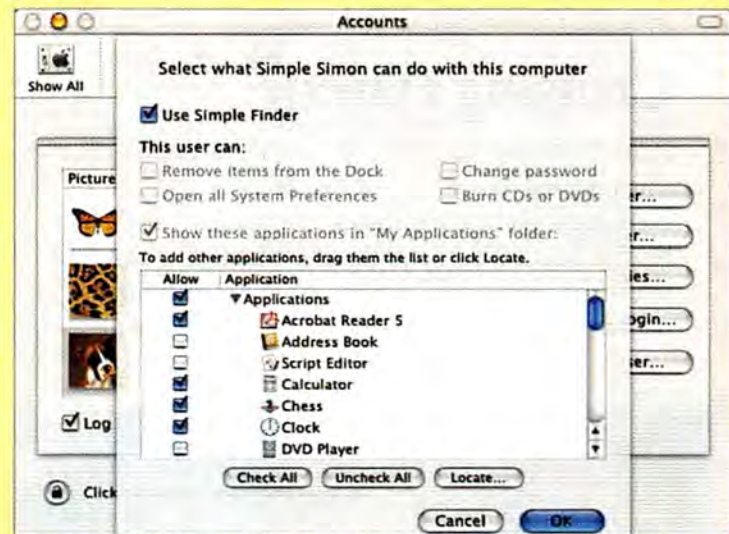
In the past, you may have gone hunting for the Key Caps program (in the Applications: Utilities folder), but you won't need it as much, thanks to OS X 10.2's Character Palette. To make this palette appear, open System Preferences, click on the International icon, click on the Input Menu tab, and select Character Palette in the list of keyboard layouts. You've just added a new icon to your menu bar.

The next time you're word processing or doing a page layout, choose Show Character Palette from this menu. The resulting window rounds up *all* the symbols from *all* your fonts at once. To find a particular symbol, click on the By Category tab and then click on the various category headings: Arrows, Stars/Asterisks, Math, and so on.

Double-click on a symbol to make it appear in your document. If you want to know what font it came from, click on the black, down-pointing triangle button to see details about it. But the Character Palette is so handy that you may never need to know (see "Symbolism").



Symbolism OS X's new Character Palette, available in every program, once you've turned on the Input menu (top), gives you direct access to every symbol in every symbol font—by category (you can look at regular fonts, too).

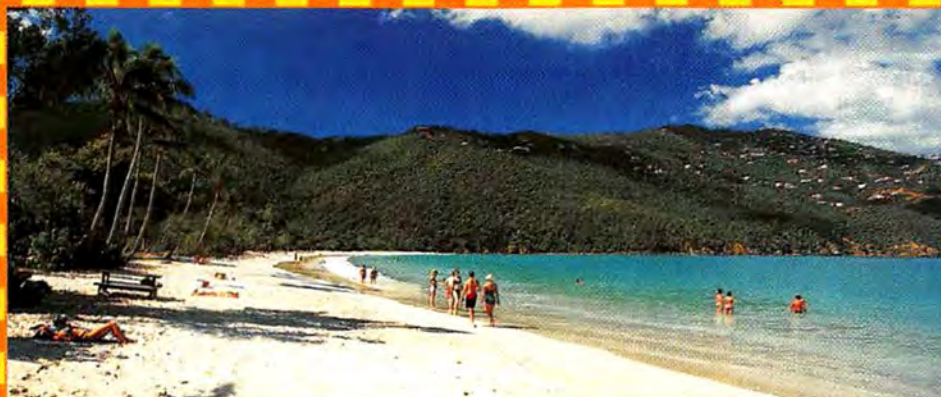


Simple Simon Does your Mac need protection from an inexperienced user—or does an inexperienced user need protection from your Mac? Turn on the Use Simple Finder option in the Capabilities dialog box of the Accounts panel (in System Preferences), and create an account with limited access to programs and files. You might want to make Kid Pix available to your six year old, for example, but not Disk Utility.

The Last Word

After loading Jaguar onto your computer, you may think of it as a big and intimidating beast. After all, this version of Mac OS X is filled with new features both large and small—and we've been able to touch on only some of them here. But with just a little knowledge and practice, you'll soon harness Jaguar's power—and enjoy making it purr. □

Contributing Editor DAVID POGUE (www.davidpogue.com) is the author of *Mac OS X: The Missing Manual*, second edition (O'Reilly, 2002), which covers Jaguar 10.2. He also writes the weekly technology column *State of the Art*, for the *New York Times*.



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PHOTOGRAPH BY RICHARD BAKER

APPLE'S NEW DUAL-G4 MACS

BY JONATHAN SEFF



Are Two Chips Better Than One? Macworld Lab Puts Them to the Test.

In August, Apple announced a new line of Power Mac G4s. There are some changes on the outside of these new Macs, and there are even more alterations inside—including more processors, different RAM, and more hard-drive space.

To find out how these new desktops measure up to previous models, we tested final versions of the dual-867MHz and dual-1GHz Power Macs (see “Dual-867MHz and Dual-1GHz Power Mac G4s” for our review) and a prototype version of the dual-1.25GHz model. Here’s a look at what Apple’s engineers did to make these Macs the fastest yet—and how well they’ve succeeded.

Meet the Macs

These new Power Macs are powered by fast processors. The \$1,699, baseline model features two 867MHz G4 processors (the single-867MHz model sold for \$2,499). The midrange, dual-1GHz Power Mac sells for \$2,499 (the previous dual-1GHz machine sold for \$2,999). And at the top of the line is a \$3,299 Power Mac with two 1.25GHz G4 chips, each of which can claim to be the fastest chip ever to inhabit a Mac.

Dip into the Chips Fundamentally, the processor at your Mac's core is its brain. A processor's speed is measured in megahertz (or gigahertz)—that is, how many millions (or billions) of cycles per second it can achieve. The more cycles it achieves per second, the faster it can work.

With two processors rather than one, these models do most other Macs one better. Mac OS X is *multitbreaded*, so most of an OS X system's work can be evenly split

across both processors. OS X is also multiprocessor savvy, so as it balances work between the two processors, it's always making sure they're both operating at peak efficiency. The result is a system that's not only faster but also able to run several programs at once without blinking an eye.

Macworld Lab's tests of these systems show the difference that dual processors can make (see "True Colors"). Consider the dual-867MHz Power Mac G4 and its

MOTHERBOARD

HEAT SINK

This large piece of metal surrounds the dual processors on your motherboard and helps draw heat away from them.

RAM

With four slots, the new Power Macs can contain as much as 2GB of fast DDR RAM (only one slot is filled by default).

4× AGP

The fast AGP graphics slot comes standard with either the Nvidia GeForce4 MX or the ATI Radeon 9000 Pro AGP graphics card.

PCI

Four 64-bit, 33MHz PCI slots allow you to add PCI cards such as SCSI and digital audio or video.

56K MODEM

A built-in 56K V.92 modem allows dial-up access to the Internet.

AIRPORT

All new Macs are wired for AirPort wireless connectivity—just add an AirPort card to this slot.

ATA/100 CONNECTOR

This 100-Mbps hard-drive bus can connect two hard drives, including the stock drive.

ATA/33 CONNECTOR

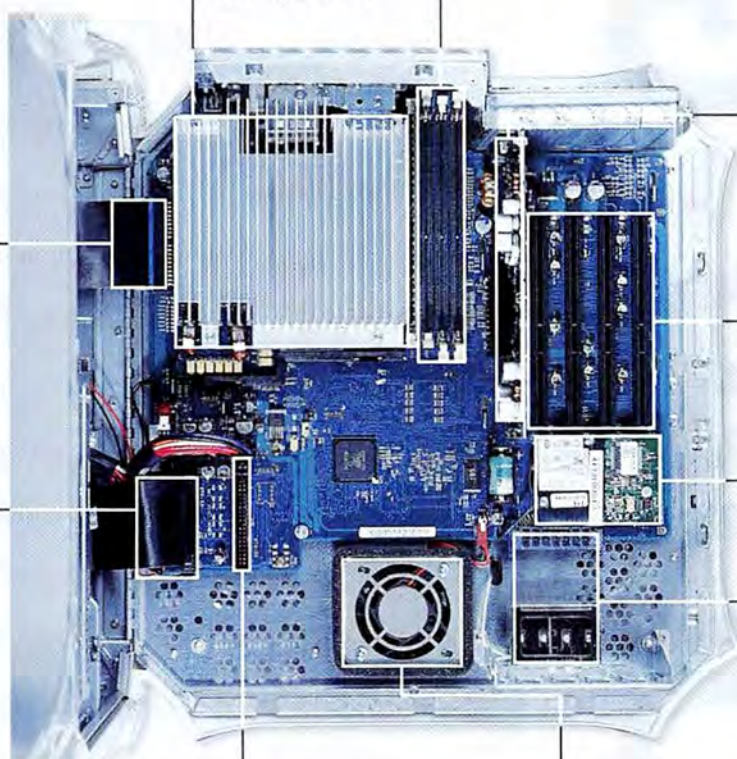
This 33-Mbps bus can connect two optical drives.

ATA/66 CONNECTOR

This 66-Mbps hard-drive bus can connect two additional hard drives.

FAN

This is one of several fans that keep the new Power Macs' insides cool.



single-processor predecessor: overall, the dual-processor system's Speedmark score was 8 percent better, and in our processor-hungry 3-D-rendering test, it was nearly twice as fast.

Speed Boosters

While the processor is the beginning of any discussion about a computer's speed, it's far from the last word on the subject. The Mac is made up of connected systems running at different speeds. How well

they work together can have a major impact on performance.

Processor Caches To make processors work as efficiently as possible, engineers include *caches* of special RAM connected directly to the processor. These caches are full of commonly used commands and data, and the processor can communicate with them much faster than it can communicate with your Mac's main memory.

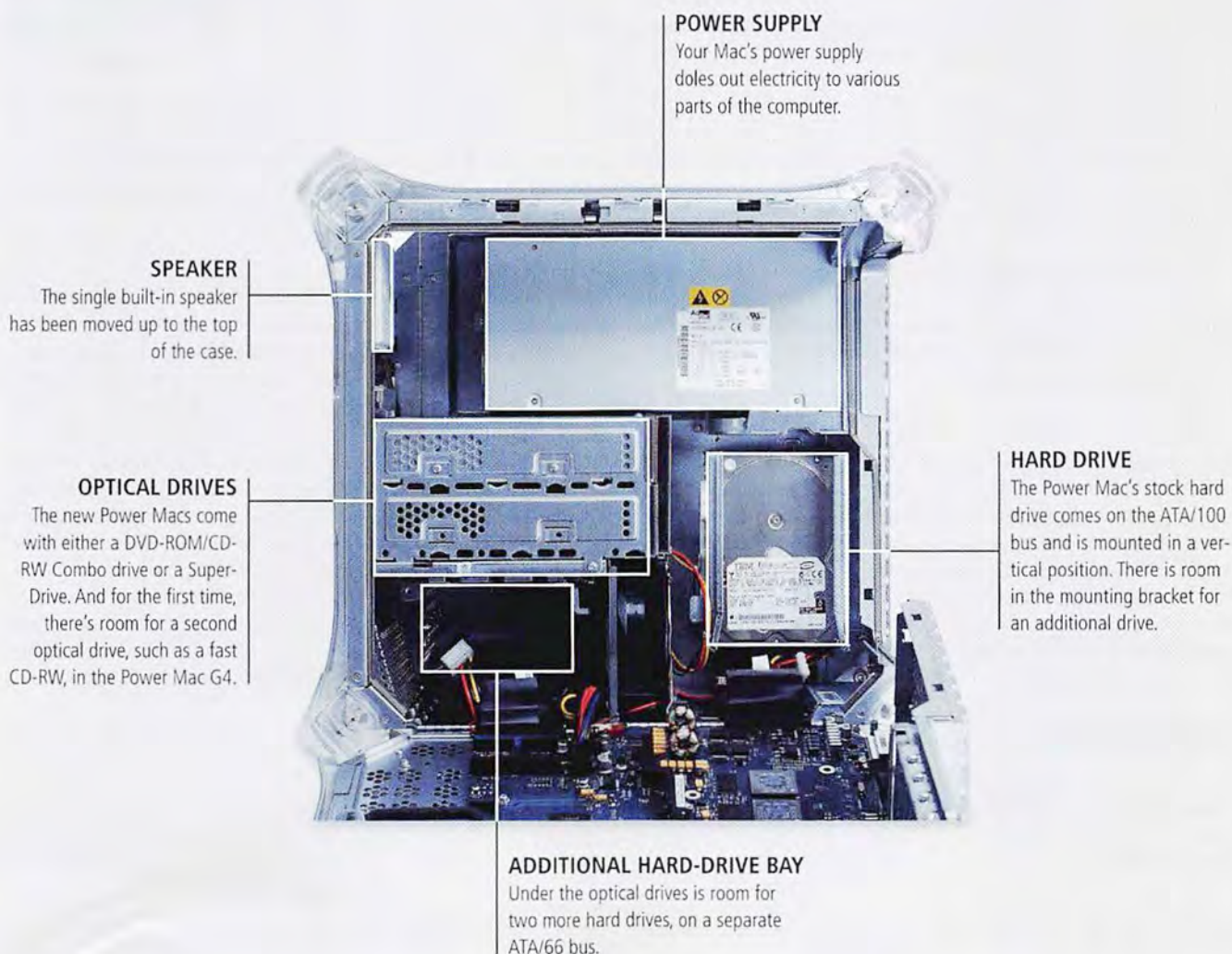
The Power Mac's processors already have 256K of built-in cache,

known as *Level 2 (L2)* cache. L2 cache runs at the same speed as the processor; they are the fastest two components in the Power Mac. To aid performance even more, many high-end systems also come with additional cache, called *Level 3 (L3)* cache, which runs a bit slower than the processor (in the case of these Power Macs, at one-fourth or one-fifth of its speed) but still provides a major speed boost.

In a first for Power Macs, every one of the new G4 systems has

APPLE'S
AL-G4 M
S NEW
DUAL-G
APPLE'S
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INSIDE CASE



POWER SUPPLY

Your Mac's power supply doles out electricity to various parts of the computer.

SPEAKER

The single built-in speaker has been moved up to the top of the case.

OPTICAL DRIVES

The new Power Macs come with either a DVD-ROM/CD-RW Combo drive or a SuperDrive. And for the first time, there's room for a second optical drive, such as a fast CD-RW, in the Power Mac G4.

HARD DRIVE

The Power Mac's stock hard drive comes on the ATA/100 bus and is mounted in a vertical position. There is room in the mounting bracket for an additional drive.

ADDITIONAL HARD-DRIVE BAY

Under the optical drives is room for two more hard drives, on a separate ATA/66 bus.

DUAL-867MHZ AND DUAL-1GHZ

NEW G4S PROVIDE GOOD VALUE AND SLIGHTLY BETTER PERFORMANCE

Since its introduction in February 2000, the Power Mac G4 has been a feather in Apple's cap. The G4 has what many users look for in a professional desktop system, including a powerful chip and many expansion options.

In this, the third major revision to the Power Mac G4, Apple has instituted several changes to the case design and the computer architecture, making Power Macs even more attractive: dual processors standard across the line; more room for RAM, hard drives, and optical drives; and better graphics cards—to name a few.

Wonder Twins

The biggest change to the Power Mac lineup is that all the new models have two processors—in the past, dual processors have usually been reserved for the top-of-the-line Power Mac model. We reviewed two configurations: the dual-867MHz and the dual-1GHz G4; each processor in these Power Macs has 1MB of L3 cache. Due to Mac OS X's support for multiple processors, these machines are faster in many areas than their single-processor predecessors.

In our Speedmark tests (see "True Colors"), the dual-867MHz model's overall score was 11 points higher than the single-867MHz model's, and many individual scores were very close. In our application tests, the dual-867MHz model was much faster than the single-867MHz machine—generally by 20 to 40 percent.

Comparing the new dual-1GHz model with the old was also interesting, as they performed at roughly the same speed. Where they differed, it was only by a few seconds. In our After Effects test, the new model was 11 percent faster; in our Photoshop test, it was slightly slower.

On the Case

The two processors—along with a bunch of other stuff—are packed into a new case. For one thing, you'll notice four heat vents on the bottom front of the case and dozens more on the back. The case is grayer (and less silver) than the previous revision, and the speaker has been moved from the bottom to the top. The most striking difference is the drive-bay doors' polished metal, as reflective as the back of an iPod. Above them is the power button (also shiny metal), but no reset or programmer's button. (To reset, you have to hold down the power button until

the machine powers down and then press it again to restart.)

The ports are more tightly clustered now, and they include two 400-Mbps FireWire ports; two 12-Mbps USB 1.1 ports; a Gigabit Ethernet port; a 56K V.92 modem port; and four 64-bit, 33MHz PCI slots.

One feature whose absence has caused a stir among buyers of recent Power Mac revisions has returned: on the back of the new Power Macs is an analog audio-in port, now with a higher, 24-bit resolution, as well as an additional audio-out port (useful for connecting your Mac to a stereo system) and a port for Apple's Pro Speakers (a \$59 option). Apple has also added a headphone jack to the front of the tower, for easy access.

On the inside, Apple switched the position of the PCI and RAM slots, which made it more difficult for us to install RAM modules. The RAM slots are now sandwiched between the video card and the giant heat sink—both are so tall that sticking our fingers in between them was a tricky task.



Driving Lessons

Unlike recent Macs, the new Power Macs have room for two optical drives—so you can now have a SuperDrive or Combo drive and a fast, dedicated, internal CD-RW drive. This is welcome news, since the SuperDrive takes more than nine minutes to complete a 74-minute CD—the fastest CD burners (at 48x speed) can do the same task in about one and a half minutes. Internal IDE CD burners are also less expensive than their external FireWire counterparts. Apple can customize your Power Mac with two optical drives, but otherwise, it sells only the SuperDrive and Combo drive—which burns at 16x. Installing your own drive, however, is a relatively painless process.

Installing a game from CD was quite slow on the new dual-1GHz Power Mac, taking 45 percent longer than the same task on the dual-867MHz model—most likely because the SuperDrive reads CDs at 24x, as opposed to 32x for the Combo drive.

Dual-Processor Duo

COMPANY	PRODUCT	MOUSE RATING	PRICE	CONTACT	SYSTEM BUS	OPTICAL DRIVE	RAM TYPE/ RAM/ MAX RAM	HARD DRIVE	GRAPHICS CARD/RAM	PROS	CONS
Apple Computer	Dual-867MHz Power Mac G4	★★★★	\$1,699	800/538-9696, www.apple.com	133MHz	Combo drive	PC2100 DDR/256MB/2GB	60GB	Nvidia GeForce4 MX/32MB	Dual processors in entry-level machine; more expansion than previous models; DDR RAM.	Slower bus/RAM speed; no SuperDrive.
Apple Computer	Dual-1GHz Power Mac G4	★★★★	\$2,499	800/538-9696, www.apple.com	167MHz	SuperDrive	PC2700 DDR/256MB/2GB	80GB	ATI Radeon 9000 Pro/64MB	More expansion than previous models; DDR RAM.	No significant performance increase over last dual-1GHz.

POWER MAC G4S ▶

True Colors

Macworld LAB TEST	Speedmark 3.2	Adobe Photoshop 7	iMovie 2.1.2	iTunes 3	Quake III v1.30b5	Cinema 4D XL 7.303	Adobe After Effects 5.5
	OVERALL SCORE	SUITE	RENDER	MP3 ENCODE	FRAME RATE	RENDER	RENDER
Apple Power Mac G4/1.25GHz DP (DDR)*	185	0:31	0:33	0:26	131.5	3:01	6:07
Apple Power Mac G4/1GHz DP (DDR)	163	0:38	0:40	0:32	120.8	3:42	7:18
Apple Power Mac G4/867 DP (DDR)	152	0:45	0:46	0:37	92.8	4:19	8:21
Apple Power Mac G4/1GHz DP	166	0:39	0:38	0:32	98.0	3:43	8:07
Apple Power Mac G4/933	156	0:54	0:43	0:43	82.0	7:18	9:57
Apple Power Mac G4/867	141	0:59	0:47	0:48	50.7	7:53	10:22
	>Better	<Better	<Better	<Better	>Better	<Better	<Better

BEST RESULTS IN BOLD. REFERENCE SYSTEMS IN ITALICS. * Preproduction model. Results of shipping model may vary.

Speedmark 3.2 scores are relative to those of a 700MHz eMac, which is assigned a score of 100. Photoshop, iMovie, iTunes, Cinema 4D XL, and After Effects scores are in minutes:seconds. Quake III scores are in frames per second. We tested each system with Mac OS X 10.2 installed and 256MB of RAM. We set displays to 1,024-by-768-pixel resolution and 24-bit color. For the Photoshop Suite test, the systems were upgraded to 512MB of RAM; the test is a set of ten scripted tasks using a 50MB file. Photoshop's memory was set to 100 percent and History was set to Minimum. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long, converting it from the hard drive using iTunes' Better Quality setting. We tested Quake III at a resolution of 1,024 by 768 pixels with Graphics set to Normal. Our single After Effects composition had multiple layers. We made transfer-mode changes and applied several dynamic geometric changes to each layer. We performed final renderings at maximum quality. For more information on Speedmark 3.2, visit www.macworld.com/speedmark. —MACWORLD LAB TESTING BY ULYSSES BRAVO AND JAMES GALBRAITH

More Hard-Drive Space When it comes to hard-drive space, this cavernous Power Mac is also better prepared than its predecessor. There is now room for as many as four 3.5-inch ATA hard drives, and with 120GB ATA hard drives currently available, that provides for nearly half a terabyte of fast (7,200-rpm) internal storage. The previous model had room for only three drives, and without an additional ATA PCI card, you could accommodate three only if you didn't have a Zip or tape drive connected internally.

Apple has introduced some clever new design tactics for hard drives as well. Hard-drive brackets no longer use screws to connect to the case—they snap into place and are released with a small clasp. This makes installing new drives a little faster and easier. Also, in order to accommodate four drives, the two drives attached to the ATA/100 are mounted vertically instead of in the more usual horizontal position.

Pretty Pictures

All new Power Macs have the same 4× AGP dedicated graphics slot as before, but Apple has stepped up what's in that slot. New Power Macs include either the 32MB Nvidia GeForce4 MX (on the dual-867MHz) or the 64MB ATI Radeon 9000 Pro (on the dual-1GHz). Both standard graphics cards can power two displays—each has one output for Apple's proprietary ADC connection and one for the industry-standard DVI connection, both for connecting digital LCD displays. Each output supports digital resolutions of 1,920 by 1,200 pixels and analog resolutions of 1,600 by 1,200 pixels. (Apple includes a DVI-to-VGA adapter so you can still connect a VGA CRT monitor, and in case you want to use two Apple ADC displays at once—both cards can drive two 23-inch Apple Cinema Displays—Apple sells a DVI-to-ADC adapter for \$149.)

The dual-867MHz with the GeForce4 MX put out 92.8 frames per second at 1,024-by-768-pixel resolution—83 percent more than the single-867MHz with the GeForce2 MX. The dual-1GHz with the Radeon 9000 Pro managed 120.8 frames per sec-

ond, or almost 25 percent more than the previous dual-1GHz model (the old dual-1GHz's GeForce4 MX had the same 64MB of DDR RAM as the new Radeon 9000 Pro).

Price

These two new Power Macs cost slightly more than their Quicksilver counterparts at the entry-level and midlevel positions—\$100 and \$200, respectively. However, what you get for your money is in most cases a significant improvement. Both models include two processors instead of one, and those processors are faster. The dual-867MHz has 1MB of L3 cache per chip, whereas the 800MHz G4 had no L3 cache. However, this dual-1GHz model has half its predecessor's cache: 1MB per chip. The dual-867MHz also has a Combo drive instead of a CD-RW drive, a larger hard drive, and a better graphics card. The new dual-1GHz has a faster system bus, bigger hard drive, and better graphics card.

Both systems now use DDR SDRAM, which is faster but costs about twice as much as the same amount of PC133 RAM (at press time)—something to remember, since you can't use your old Mac's RAM in the new Power Macs. Both also ship with OS X 10.2 installed as the default operating system and include OS 9.2.2.

Macworld's Buying Advice

The new dual-processor 867MHz and 1GHz Power Macs are a good value—especially for people upgrading from older (Sawtooth) G4s. For a little more money than corresponding previous models, you get two G4 processors, more expansion, and better graphics support. For owners of top-of-the-line Quicksilver Power Mac G4s, however, these two new models don't offer substantial benefits. If you want the fastest Mac on the planet, wait to see what the dual-1.25GHz model has to offer. If the final edition matches the performance of the prototype we tested, it will be worth the wait.

built-in L3 cache. The new dual-867MHz and dual-1GHz Power Mac configurations have 1MB of L3 cache per processor; the dual-1.25GHz model has 2MB per processor. L3 cache can have a major impact on performance. At first it might seem perplexing that in most of our tests, the new dual-1GHz Power Mac was slightly slower than the previous dual-1GHz Power Mac—but there's an important difference between the two systems: the older model has 2MB of L3 cache per processor; the new model has only half that and suffers for it.

System Bus Your Mac's system bus, also known as the frontside bus, is an important factor in your Mac's speed, since it's the pathway through which data flows as it travels back and forth between the processor and your Mac's main memory.

The dual-867MHz Power Mac has the same 133MHz bus as previous Power Macs. But the dual-1GHz and dual-1.25GHz models have a 167MHz system bus, so about 1.3GB of data per second can flow along the conduit between the RAM and the processor.

RAM All previous Power Mac G4 models have used some form of standard SDRAM (synchronous dynamic random access memory). In the recent Quicksilver Power Mac G4s, speeds topped out at 133MHz. (The speed of your RAM is based on the speed of the system bus—for example, a 133MHz system bus requires 133MHz of RAM.) Apple's first foray into newer RAM technology came with the Xserve, which features the same RAM style that appears in these new Power Macs: Double Data Rate (DDR) SDRAM.

This new RAM is also based on the speed of the system bus, but it

can send and receive data twice during one tick of the system bus's clock. This effectively doubles the throughput of your Mac's RAM—hence the name Double Data Rate.

The dual-867MHz Power Mac, with the same 133MHz system bus as the previous G4 models, uses 266MHz DDR SDRAM (also called PC2100). And the 1GHz and 1.25GHz models, with 167MHz buses, use 333MHz DDR SDRAM (also called PC2700). The names PC2100 and PC2700 refer to how fast data can be transmitted to or from RAM: 2.1 GBps (2,100 MBps) and 2.7 GBps (2,700 MBps), respectively.

To understand how that bandwidth can be doled out, think of your Mac's RAM as a glass of water. Put one straw in the glass, and you can drink a certain amount of water per second. But if other people put straws in as well, the amount of

BACK

DISPLAY CONNECTORS

Now every Power Mac model can easily connect to two displays—one ADC and one DVI flat panel. Apple includes a DVI-to-VGA adapter for connecting a CRT monitor, and you can purchase a DVI-to-ADC adapter to connect two Apple flat-panel displays at once. Both standard graphics cards can support two 23-inch Apple Cinema Displays.

GIGABIT ETHERNET AND 56K MODEM

Gigabit Ethernet is the fastest networking available on any Mac. Its throughput of as much as one gigabit per second is ten times that of standard 100BaseT. OS X 10.2 supports the V.92 modem standard, making the included 56K modem a little more bearable: V.92 enables functions such as *modem on hold*, which puts your internal modem on hold when you get a phone call.

AUDIO-IN AND AUDIO-OUT PORTS, DIGITAL-SPEAKER PORT

The improved audio-in port allows you to record audio at 24-bit stereo, which is better than any previous Mac's audio-input support. The audio-out port provides a way to send audio to a tape deck or amplifier. The digital-speaker minijack connects to Apple Pro Speakers.

PCI SLOTS

There are four 64-bit, 33MHz PCI slots, and you can load them with cards for a variety of tasks, including SCSI connectivity, video capture, and music production. By default, all four slots are empty, but Apple can customize your Power Mac with an Ultra SCSI card and cable or with a dual-channel Ultra160 SCSI card and fast internal SCSI drives.

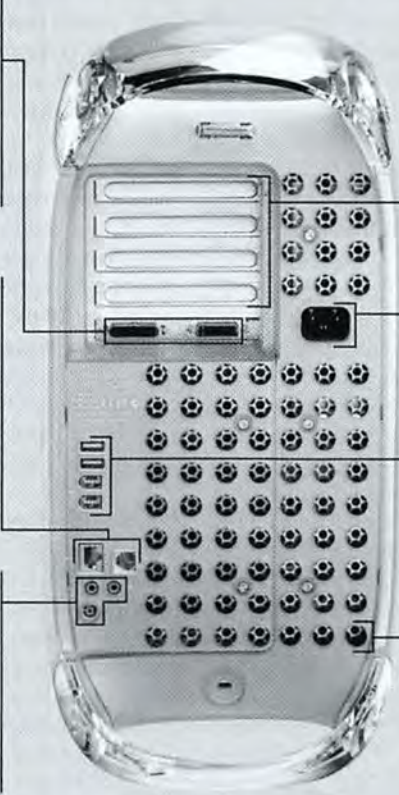
POWER

2 FIREWIRE AND 2 USB PORTS

The G4 FireWire ports—used for connecting devices such as digital camcorders and external hard drives and CD-RW drives—have 400 Mbps of bandwidth. The USB 1.1 ports—used for connecting devices such as keyboards, mice, and digital cameras—have 12 Mbps.

HEAT VENTS

The G4s' dual processors and other fast components can heat things up pretty quickly. To prevent that heat from damaging your Mac, Apple riddled the case with heat vents.



liquid you can collectively drink per second is much greater.

In the standard Mac architecture, most things communicate with the RAM via the system bus—all drinking out of one narrow straw. If the processor uses all the bandwidth of the system bus, there's nothing left over for the hard drives or graphics system. But with these new Power Macs, other parts of the system (such as hard drives and the graphics card) have extra bandwidth—basically, their own straws—for communicating directly with the RAM (known as *direct memory access*), without regard to what the processor is doing.

So even though the high-end Power Macs' 167MHz system bus can drink only at 1.3 GBps, there are additional straws available for other parts of the system. This should be most noticeable when your Mac uses many subsystems simultaneously—capturing high-definition video or recording and playing back multitrack audio, for example.

Speed isn't the only RAM-related change in these new Power Macs. Apple has also added a fourth RAM slot, allowing you to install as much as 2GB of RAM (the previous limit was 1.5GB), with four 512MB chips.

Storage Apple has designed the new Power Macs with room for two optical drives. Previously, you could have one optical drive and another, smaller drive such as a Zip or tape drive.

There are also two discrete ATA drive buses on the motherboard, giving you built-in support for four internal drives, in addition to the two optical drives, all without any ATA add-on cards.

The primary hard drive is located on a fast ATA/100 bus with a maximum throughput of 100 MBps. A second ATA/66 bus is available, and Apple recommends that when you add a second drive, you add it to this second bus. Since each bus can transmit only a certain amount of data at one time, it's best to balance the number of drives on each bus, allowing each drive to sip a full

straw's worth of its connection to your RAM (rather than having them fight over access to a single straw).

Video Cards Your Mac's speed can be dramatically affected by the power of its video card—particularly when you're playing games. (OS X 10.2's Quartz Extreme technology, which offloads many screen-drawing tasks to video cards, makes those cards even more important.) These new Power Macs clearly excel in this area, as our Quake III frame-rate tests showed. The dual-867MHz model, powered by an Nvidia GeForce4 MX card, had a frame rate nearly twice that of its single-867MHz predecessor. And the dual-1GHz and preproduction dual-1.25GHz models, each outfitted with an ATI Radeon 9000 Pro card, had far and away the best frame rates of any system we've ever tested.

Putting It to the Test

In our tests, the new dual-1GHz Power Mac performed roughly the same as the dual-1GHz model that came before it. Although the new model has a faster system bus, it also has half the L3 cache per processor—a very important factor in a system's speed. This is evidence that the new architecture, with its faster system bus, is indeed an improvement, since it can overcome the shortcomings of less L3 cache and achieve similar (and at times, better) performance. As faster chips become available and Apple is able to increase the system-bus speed, Mac users should be able to reap even more of this new architecture's benefits.

We tested this hypothesis with a preproduction model of the dual-1.25GHz Power Mac. With faster chips and twice the L3 cache of the other models, it performed as expected; that is, it was the fastest of the new Power Macs. It matched or beat—by as much as 19 percent—the new dual-1GHz Power Mac in most of our tests. (Processors that were 25 percent faster did not equate to 25 percent faster performance overall; however, we ran our Speedmark tests on all machines

with 256MB of RAM, and the high-end configuration will ship with 512MB.)

There were notable exceptions: installing a game from CD (the dual-1.25GHz model was faster than the dual-1GHz model but much slower than the dual-867MHz model, which has a faster optical drive) and start-up times (the new Power Macs took longer than any of our reference systems—they have several fans that seem to turn on at start-up, delaying the process).

Our After Effects test brought one oddity to our attention. The first time we ran the test, the new dual-1GHz model was more than a minute faster than the older dual-1GHz configuration. But when we switched the hard drives between machines, the older Mac (with the newer drive) was a minute faster—so the drive in the newer model seems to be faster.

Our tests, which involve common operating-system tasks and some higher-end applications, don't max out system performance. If your work involves high-end tasks (capturing video via PCI, the hard drive, and graphics systems, in addition to the processor, for example), you may see even greater speed gains from the top-of-the-line model—and if the fastest performance numbers are what you're after, the dual-1.25GHz model looks very promising.

The Last Word

By redesigning the Power Mac's guts, Apple has demonstrated its commitment to getting the most out of these systems, regardless of the G4 processors' available speeds. With two G4 processors in every model, larger hard drives, more-powerful graphics cards, room for two optical drives, speedier RAM, and (in two of three models) faster system buses, the new Power Macs are worthy additions to Apple's hardware lineup. □

Associate Editor JONATHAN SEFF specializes in system hardware and multimedia, and he's in the market for a new Mac to replace his Power Mac G4/450.

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SERVE IT UP

Build Dynamic Web Sites without Leaving Your Mac

Sports scores displayed in real time, auctions that run themselves, catalog prices updating instantaneously across an entire Web site—none of this dynamic interactivity is possible with plain-vanilla HTML. Today's best Web sites are full-blown applications built on top of sophisticated databases.

But until recently, Mac users were at a disadvantage when it came to building Web applications such as these. The most popular dynamic Web tools didn't run on the Mac, so we had to set up a second computer to use them. Meanwhile, the tools that did run on the Mac were expensive and not as widely supported as those that ran on powerful Unix servers.

Well, that's no longer the case. With the release of OS X, Mac users can at last build, test, and deploy dynamic Web sites—all from a single machine. Now, the same database tools used to build world-class



Internet sites such as those from NASA, MP3.com, and Yahoo Finance are available for free to OS X users. As a result, Mac users no longer have to take a backseat to Unix folks when it comes to developing dynamic Web sites.

In this article, we'll show you how to get up and running with one of the Web-publishing world's favorite combinations: the Apache Web server, MySQL database server, and PHP scripting language. These three tools work in concert to let Mac-based Web developers create dynamic sites with the same tools that Unix pros use. In fact, with a world-class server OS at its foundation, the Mac can be more than just a development machine—it's ready to be a live hosting platform.

To follow these instructions, you'll need OS X 10.2. (For details on setting up this environment with earlier versions of OS X, go to www.macworld.com/2002/11/features/database.html.)

The Tools

Whether you're building the next eBay or creating a simple contact database that employees can access over the Web, you'll need to enable three major components on your OS X machine before you can add dynamic content to your pages.

Apache To deploy any Web site, you need a Web server to process page requests from users and return the appropriate files. And it just so happens that the world's most popular Web server is built into OS X. The Apache Web server is available for nearly every platform under the sun. Its fast performance, flexibility, and low price (it's free) make it a strong choice for serving sites of any size.

MySQL You'll also need a database server, which hosts data sets and responds to queries from other programs (such as scripted Web pages).

MySQL is one of the most popular open-source database servers available. A MySQL server can host a collection of databases—each of which contains a set of related tables filled with data. (For a discussion of how MySQL terms relate to those of FileMaker Pro, see "Making the Leap.") Because it's compact, very fast, and compatible with the industry-standard Structured Query Language, MySQL is particularly well suited to Web use—and like Apache, MySQL is free.

PHP Your Apache and MySQL servers alone won't generate dynamic content. Because HTML is a markup language, not a programming language, it has no direct way of communicating with databases. This means you need a "diplomat"—a scripting language that can communicate with both servers to fuse static HTML templates and data from your database records. For this component, we'll turn to PHP, a scripting language included with OS X.

PHP lets developers add interactivity to Web pages by interspersing programming instructions with HTML. When a user requests a Web page that

includes PHP code, the Web server's PHP module executes that code and inserts the results into the HTML page that's returned to the user. As a result, if you view the source of any PHP page on the Internet, you won't see any PHP code—it was all executed and converted into plain text or HTML *before* it was sent to you.

And you no longer have to be a programming wizard to add PHP scripts to your Web pages. Both Macromedia Dreamweaver MX (\$399; 800/470-7211, www.macromedia.com) and Adobe GoLive 6 (\$399; 800/833-6687, www.adobe.com) now come with PHP support built in.

Putting It Together Apache, MySQL, and PHP (often referred to as *AMP* when used in combination) are each independent packages—Apache can work with other scripting languages, just as PHP can work with other databases. However, there are advantages to using them together. Because each is open source, their development teams work closely to make sure the three are tightly integrated. For example, PHP has more built-in functions for communicating with MySQL than with any other type of database.

Used in conjunction, Apache, MySQL, and PHP seamlessly collaborate to create dynamically generated Web pages (see "Behind the Scenes"). When Apache receives a request for a new Web page, it sends any included PHP code to the PHP interpreter for processing. If the PHP code includes database requests, the PHP module passes those on to the MySQL server (which typically runs on the same computer). Once the PHP module gets the results back from MySQL, it inserts them into the waiting HTML template and returns the finished document to Apache, which in turn hands it back to the client.

What You'll Need Building a basic system like the one we just described isn't difficult. Since OS X comes with the Apache Web server and PHP support, you're already a portion of the way there. And although MySQL isn't included with your Mac, it can be installed in minutes (though you will need some technical know-how).

For the sake of this article, we'll assume that you already have OS X 10.2, basic HTML skills, and a text-based editor such as Bare Bones Software's BBEdit (\$119; 781/687-0700, www.barebones.com). You can also use the code mode built into Dreamweaver or GoLive. You'll use OS X's Terminal application to initially set up and configure the software, but don't worry—you won't need it to build or manage your databases.

If you've purchased Adobe GoLive 6, you can skip our instructions for installing your AMP component. GoLive 6 comes with a preconfigured AMP setup—just run the installers (located on the CD pasted to the back of the program's Web Workgroup Server User Guide) and follow the Read Me file's instructions. Of course, if you don't have GoLive 6, you can have the exact same setup for free—you'll just have to install a bit of the plumbing yourself.

STEP 1: SET UP A WEB SERVER

Although Apple builds Apache and support for PHP into OS X, it doesn't actually turn these features on. You'll have to do that part yourself. Here's how:

Turn PHP Support On To activate Apache's PHP module, you'll first need to modify the Apache configuration file. Since the configuration file is hidden from the Finder, you'll have to make a trip to the command line.

Open Terminal (Applications: Utilities: Terminal). Before you make any changes, you'll want to create a backup of your Apache configuration file—just in case something goes wrong. To do this, type the following commands into the Terminal window:

```
cd /etc/httpd
sudo cp httpd.conf httpd.conf.orig
```

Enter your administrator password when prompted, and then type `sudo pico httpd.conf`.

This command opens your Apache configuration file in `pico`, a Unix text editor. In `pico`, press control-W to open the Find command, and then type `php`. When you hit the return key, your cursor should land on the line `#LoadModule php4_module libexec/httpd/libphp4.so`. Using the left-arrow key to move your cursor, remove the `#` character at the beginning of this line.

Press control-W again. This time, type the string `mod_php4.c` and press return. Remove the `#` character from the beginning of this line as well.

Press control-W a third time and search for the string `x-tar`. When you land on it, move your cursor to the end of the line, press return, and then add the line `AddType application/x-httpd-php.php`.

Once you've made these three changes, save the file by pressing control-O and then the return key. Press control-X to exit `pico`.

Apache should now automatically load the PHP module on start-up. When the Web server encounters pages ending in `.php`, it'll send them to the PHP module for interpretation.

Start Apache With PHP enabled, you're ready to flip the switch on your Web server. Open your System Preferences and select Sharing. Click on the Services tab, and select the Personal Sharing option. Click on Start. (If Web sharing was already on, you'll need to turn it off and then back on to activate the changes you've made.)

Testing To find out whether the PHP module has been correctly activated, open your favorite text editor and create a new document. (If you're using Apple's TextEdit, make sure you've turned off the program's Rich Text features, in Preferences, first.) In your blank document, type `<? phpinfo(); ?>`. Save the file as `test.php` in the Sites folder in your user's folder.

Open your Web browser, and type in the address `http://localhost/~username/test.php`, where `username` is your short name on the OS X machine. (Because PHP is a server-parsed language, nothing will happen if you open a PHP file in your Web browser via the File menu or by double-clicking. To execute PHP pages, you *must* access them through a PHP-enabled Web server.)

Your browser should display tables packed with arcane data about your new PHP environment. If you see only one line of raw PHP code, repeat this step.

STEP 2: SET UP A DATABASE SERVER

With your PHP-enabled Web server up and running, you're ready to install a MySQL database server. There are a number of MySQL installers for OS X floating around on the Web; Marc Liyanage offers the easiest one (www.entropych.com/software/macosx/mysql/). Download the 3.2X-jaguar version (unless 4.0 is out of beta by the time you read this). While you're at Liyanage's site, download the `mysql-startupitem` installer as well—you'll need it later.

Install MySQL To install the database server, unpack the `mysql-3.2X-jaguar.pkg.tar.gz` on your desktop, and then double-click on the resulting `.pkg` file. Follow the installation instructions.

Once installed, the database needs to be initialized and launched. This requires another trip to Terminal. Open a Terminal window and type:



Behind the Scenes Since HTML can't speak to databases, a programming language such as PHP must bridge the gap between plain-vanilla HTML and live data sets. In a standard HTML request, the Web server ① simply sends the requested file to the client. If the page includes PHP code, that code is passed to the PHP module ②—which runs within Apache—for execution. If the PHP code includes MySQL queries, the PHP module passes those requests to the database server ③ for processing. Results of the database query are returned to the PHP module for inclusion in the results; the PHP module then integrates them and passes text or HTML back upstream to the client.

Making the Leap

```
cd /usr/local/mysql  
sudo ./scripts/mysql_install_db
```

Enter your system admin password. (If Terminal complains that it can't resolve your host name—this can happen behind some firewall configurations—retype the line above like so: `sudo ./scripts/mysql_install_db --force`. If you're building a production server, you may need to contact your system administrator for assistance in resolving the host-name issue.) Then type:

```
sudo chown -R mysql /usr/local/mysql/*  
sudo ./bin/safe_mysqld --user=mysql &
```

Your MySQL server should now be activated.

Security and Start-Up Before moving on to building your database, there are a few server details you'll need to address. The most important is security.

By default, MySQL is not password-protected, so you should add a root password with any MySQL installation. To set your password, type the following command into the Terminal window (replacing `newpassword` with a suitably difficult password):
`./bin/mysqladmin -u root password newpassword.`

Leave Terminal open when you're done.

Next, you'll want to set your MySQL server to launch automatically when the system boots (so you don't have to manually start it from Terminal each time). You can do this with `mysql-startupitem`, which you downloaded earlier. To install it, simply double-click on the `mysql-startupitem.pkg` file on your desktop and follow the directions.

Test To try out your MySQL installation, return to the Terminal window and type `./bin/mysql -u root -p`. Enter the MySQL password. At the `mysql>` prompt, type `show databases;`.

Under the Database heading, you should see two listings: `mysql` and `test`. (These databases were created automatically during the MySQL initialization process.)

Congratulations! Your OS X Mac is now officially a MySQL server. Type `exit` to leave the MySQL monitor.

STEP 3: CREATE A MYSQL DATABASE

With the three major components now in place (Apache, PHP, and a MySQL database server), your OS X machine has everything it needs to serve up dynamic content—everything except the *content*, that is. Your next task, then, is to build a MySQL database (and its related tables) for your data.

Install phpMyAdmin While MySQL databases can be administered completely from the command line, most of us would prefer to work in a more user-friendly environment. There are many commercial products on the market that help you create and administer databases visually, but none is as economical and widely supported as phpMyAdmin, a free Web-based interface for your MySQL server.

In addition to reflecting the structure of any MySQL database running on your system, phpMyAdmin lets

If you cut your teeth on a graphical database application such as FileMaker Pro, MySQL may seem like an alien creature. But once you understand some of the basic philosophical differences between the two, you'll begin to feel more at home.

One of the most confusing aspects of transitioning from FileMaker to MySQL is really a difference in terminology. To FileMaker users, a database has only two dimensions—fields and rows. In contrast, a MySQL database is multidimensional; it consists of multiple *tables*, each of which contains its own fields and rows.

So whereas MySQL consists of multiple, interconnected tables in a single database, FileMaker consists of multiple, single-table databases that communicate with one another. The result is similar, but the conceptualization and terminology are different.

Another shocker for migrating FileMaker users is MySQL's lack of a built-in user interface beyond the command-line monitor. MySQL runs invisibly in the background, much like the Apache Web server. If you want a graphical interface for MySQL, you'll need to either build one with HTML and PHP scripts or install a management tool such as phpMyAdmin.

you create new databases, manipulate tables within those databases, and manipulate fields within those tables. You can also use it to add, change, and delete the data in your databases.

To install phpMyAdmin, go to the phpMyAdmin Project Web site (www.phpmyadmin.net) and download the latest stable version of the software in PHP (not PHP3) form. Let StuffIt unpack the archive on your desktop, locate the new phpMyAdmin folder, and rename it simply `phpmyadmin`. This will make accessing its URL later much easier. Move this folder into your Sites folder.

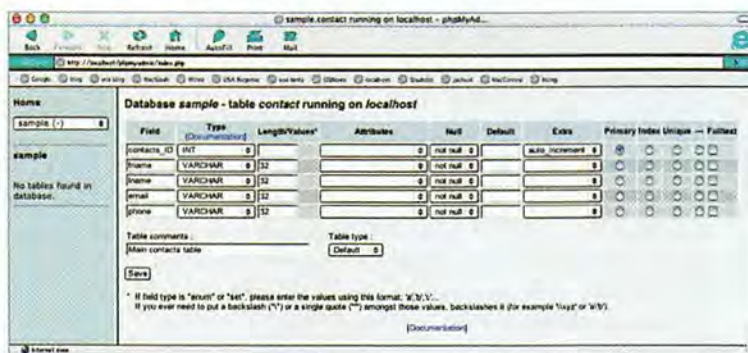
Because phpMyAdmin gives total control over your databases to anyone who can access them, it's critical that you password-protect this part of your site as well. Open the `config.inc.php` file (located in your `phpmyadmin` folder) in a text editor. Scan down the page for the line starting with `$cfg['PmaAbsoluteUri'];`, and enter `http://localhost/~username/phpmyadmin/` between the apostrophes to the right of this line.

Continue scanning until you find the line that reads `$cfg['Servers'][$i]['auth_type'] = 'config';`, and replace `config` with `http`. In the next line, make sure the `user` string is set to `root`. Move one more line down to the `password` string, and enter your database's root password between the apostrophes. Save and close the file.

Create a Database and Table Once phpMyAdmin is installed, you can use it to begin building a new MySQL database. To access phpMyAdmin, open your Web browser and type in the URL `http://localhost/~username/phpmyadmin/index.php`.

When prompted, enter the user name and the password you added to the `config.inc.php` file. You'll find yourself in the database administrator. (If you receive an error message about a problem with charset conversion, return to the config file and locate the line `$cfg['AllowAnywhereRecoding'] = TRUE;`. Change `TRUE` to `FALSE`, and try again.)

To start a new database, click on Home (in the upper left corner of your screen). Enter a name for your database ("sample," for example) in the text field below the Create New Database heading, and then click on the Create button. In the resulting window, create a new table called Contact, with five fields. Then click on Go. >>



Setting the Table

phpMyAdmin gives you total administrative control over your MySQL databases and tables. The table-creation interface lets you specify the types of information your table will include and how the table will relate to others in the database.

The next phpMyAdmin screen lets you define the names and characteristics of the fields in your new Contact table. While you don't have to fill out every field right now, a few are crucial.

Every MySQL table must have at least one column (usually the first) in which every row has a unique value. This numeric identifier (ID) field eliminates the possibility of ambiguous query results. To create this ID column, click in the first row of your empty table and enter `contacts_id` under the Field heading. Because this field is going to store only ID numbers, change the Type pop-up menu to INT, for Integer. Next, choose Auto_Increment from the Extra column's pop-up menu. This assigns the next available number to each

newly added contact record. Then, because your ID field will be the primary link—or *key*—between this table and others, select Primary. Any of the settings not mentioned here can be left at their default values.

Now enter field titles for the remaining four rows of your Contact database: `fname` (for First name), `lname` (for Last Name), `email`, and `phone`. Set the type for each to VARCHAR, to signal that these rows will be filled with character strings of variable data. Because it's unlikely that any of these character strings will be longer than 32 bytes—or characters—long, enter this number in the Length/Values column. When you're done, click on Save to commit your new columns to the database (see "Setting the Table"). Your database and its tables will appear in a list on the left side of your window. To add additional tables, select the database name from the list and repeat this process.

Entering Data Now that you have a MySQL database with at least one table, you're ready to start populating it with data. But while phpMyAdmin excels at building the structure of your databases, its one-size-fits-all approach makes it less useful for actual data entry. Instead, most database developers will probably want to use PHP and HTML to build a Web interface that provides some custom means of entering and editing data.

Nevertheless, phpMyAdmin does let you enter records directly, which is especially useful for testing purposes. Here's how:

From the list on the left of your screen, select the table you want to populate. Click on the Insert link at the top of the page, and then enter the values for your first record in the empty text fields. (Don't enter anything into the ID field. Since it's set to Auto_Increment, it should take care of itself.) Select the Insert Another New Row option, and click on Go to add another record. After you've entered a few records, click on the Browse tab to peruse your record set.

Creating a Secure User Until now, we've been working as the root user with our database. But in practice, it's safer to create multiple users, each with limited database privileges. For example, you may want employees to be able to enter data into existing tables but not to alter the structure of those tables or build new ones.

To create a separate MySQL user from within phpMyAdmin, click on Home and then select Users. Under the Add A New User section, select Host option and type `localhost`. Enter a user name and password. Under Privileges, select the appropriate options. To let users alter data but not your database's structure, for example, activate the Select, Update, Insert, and Delete options. (For a full explanation of privileges, see the MySQL documentation.) Click on Go to execute your changes.

Click on Home and then on Reload MySQL to make your user changes take hold. Now you can tell any PHP script to connect as this user, and that script's scope of behaviors will be limited to the actions you specified.

Required Reading

There are hundreds of communities, sample scripts, and tutorials out there to help you get up-to-speed with MySQL and PHP. This list is by no means exhaustive, but here are a few of our favorites.

- **MySQL Tutorial** (www.mysql.com/documentation/mysql/bychapter/manual_Tutorial.html): Terse but definitive, this tutorial focuses exclusively on MySQL.
- **Webmonkey PHP/MySQL Tutorial** (<http://hotwired.lycos.com/webmonkey/programming/php/tutorials/tutorial4.html>): This tutorial pleasantly guides the reader through the creation of simple scripts that interact with forms and include statements, database connection code, data validation, and more.
- **Developer Shed: Speaking SQL** (www.devshed.com/Server_Side/MySQL/Speak/): At some point, you're going to need to speak a bit of Structured Query Language, so you can tell your PHP scripts exactly how to interact with your databases. This tutorial teaches just enough pure SQL to get you there.
- **OnLAMP.com** (www.onlamp.com/): This metaresource on AMP development, from the O'Reilly Network (which produces the industry's best technical reference books), emphasizes open-source tools.
- **PHPmac.com** (www.phpmac.com/): This site includes PHP development resources tailored for Mac users.
- **HotScripts.com** (www.hotscripts.com/PHP/Scripts_and_Programs/): This is a massive collection of prefab PHP scripts ready to plug in to your site. In most cases, all you have to do (besides have a working PHP-MySQL rig) is tweak a few variables and go.
- **PHPBuilder** (www.phpbuilder.com/): Thousands of PHP developers—from beginning to advanced—congregate here to discuss the finer points of script building, providing an indispensable collection of articles and forums.

A Jump-Start

For even tighter control, you can restrict a user's permissions to a specific database by clicking on the Grants section in the Users table.

This is only a brief introduction to the powerful and broad capabilities of MySQL. With some scripting know-how, you can create impressively complex and specialized database systems to answer almost any demand. To help you quickly get started with MySQL, we've created a sample database and a set of accompanying PHP scripts that you can download and modify for your own purposes (see "A Jump-Start").

STEP 4: ADD DATA TO YOUR WEB SITE

You now have everything you need to build a powerful, highly sophisticated database. But this data won't flow into and out of your Web pages by itself—that's where PHP comes in.

The last stage in creating dynamic content is building PHP scripts that interact with your MySQL server to extract or insert the data you want and format it appropriately. These PHP scripts seamlessly insert their collected data into an HTML layout and send back a finished Web page.

Like any scripting language, PHP is not something you're going to learn overnight. (For some great resources, see "Required Reading.") In case you don't have the time or the desire to learn the ins and outs of a new scripting language, Macromedia and Adobe offer an easier solution. Dreamweaver MX and GoLive 6 both have tools that help you automatically generate PHP scripts. These tools won't help you build your database—you still need phpMyAdmin or something similar for that—but they do offer a more intuitive, user-friendly interface for building dynamic Web sites on top of your preexisting databases.

Like WYSIWYG HTML tools, these applications can create code that is bulkier or less elegant than what you might write by hand. But you may find their ease of use worth the added bulk. (For instructions on setting up GoLive 6 to interact with a MySQL database, see "Go Dynamic with GoLive" elsewhere in this issue.)

Transferring Your Database

If you're using your OS X machine as a development and testing environment, and you plan to hand your finished database project over to a client or ISP for hosting, you'll eventually need to transfer your MySQL database to the client's Web server. This is where phpMyAdmin's Export features come in handy. Here you can choose to export the structure of your tables, your data, or both. You can also choose an export format—such as comma-delimited, XML, or Excel-ready data.

To transfer an entire database from your Mac to another MySQL host, select your database from the

To help you get started with MySQL and PHP, we've created a starter application for you—a simple but functional contact database you can access from any Web browser, along with some useful scripts for managing its contents.

You can download the package at www.macworld.com/2002/11/features/contacts.sit. Inside the .sit file, you'll find a folder with the following files:

- a readme.txt file with installation instructions;
- a script for testing PHP support on your current system;
- a SQL script file you can use to populate a fresh database with sample tables;
- a set of PHP scripts that interact with your contacts database, letting you view, sort, edit, and add records.

Once it's installed, you'll notice that the sample contacts database is fairly rudimentary. It's not meant to replace your favorite PIM, but it will give you a taste of what's possible with MySQL on your Mac. Feel free to experiment by modifying the database

and/or PHP code. We've taken care to comment the code thoroughly, so you should be able to tell which parts of the application do what.



Extended Learning

Our downloadable sample database will quickly get you up and running with a working contacts application. Because it utilizes multiple related tables, you can view contacts all at once or, as shown here, by category.

list on the left-hand side of the screen, and then click on the Export tab. Select the Structure And Data option and then the Save As File option. Click on Go. Save the resulting file to your hard drive with a .sql extension. To load your data on the other MySQL host, bring up its copy of phpMyAdmin and go to the SQL tab. Click on Browse and then navigate to your .sql file. The database should be re-created on the new host. Make sure that any users and grants you set up on the development machine match those on the live server (these may need to be tweaked both in phpMyAdmin and in your PHP scripts). If all users and permissions are identical on both machines, your PHP scripts should work perfectly when uploaded.

The Last Word

Whether you use your Mac as a live database server or just as a development environment before you transfer your dynamic site to a big Unix server, this introduction to using Apache, MySQL, and PHP is just the beginning—we've barely scratched the surface of what you can do. The sheer number of live demos, downloadable scripts, and free documentation out there is nothing short of awe inspiring. And thanks to OS X, Mac users are once again in the thick of it. □

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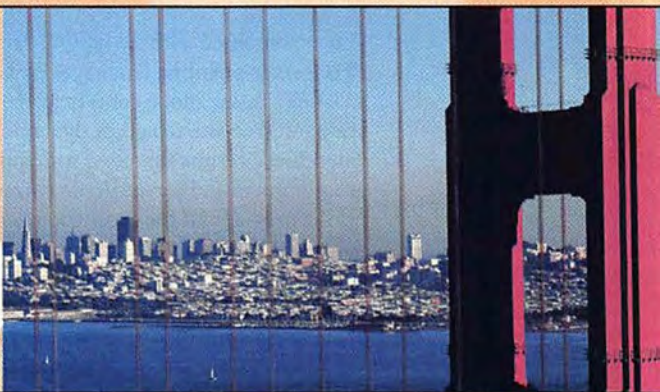
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Go Dynamic with GoLive

If your Web site features constantly changing information, such as inventory, you can save time and eliminate the hassle of updating static Web pages by using dynamic content. A dynamic site pulls information from a Web database and combines the results with HTML to create pages on-the-fly. Though making the transition from a static to a dynamic Web site may seem like a Herculean task, Adobe GoLive 6 can make the process less arduous.

When combined with a MySQL database and the PHP server-scripting language, GoLive 6 (\$399; 800/833-6687, www.adobe.com) helps you quickly configure your Web site to accept dynamic content, letting you achieve results that used to require a team of programmers and server-grade computers. Although Adobe provides all the tools you need to set up a dynamic Web site, putting them to use can be difficult if you don't know some of the basics. We'll show you how to configure GoLive and your servers to create a dynamic Web page that lets visitors submit

their personal information, such as name and e-mail address, and then automatically adds this information to a MySQL database of subscribers.

What You'll Need

Before you begin adding dynamic content to your GoLive site, you'll need to have a few things in place.

Server Setup You can't serve up dynamic Web sites without servers—two, to be exact. First, you need an Apache Web server with PHP built-in

(you already have one if you're running Mac OS X). You'll also need a MySQL server, which is an open-source, Web-enabled database. You should have both servers configured and running. (Make sure your MySQL user has permission to both read and modify the database.) In addition, your MySQL server should already have one database with at least one table set up and ready to go.

If you don't already have PHP and MySQL set up, you can install them with the GoLive Preconfigured Servers software. This software (which is located in

the Dynamic Content folder on the CD that comes with GoLive 6's "Web Workgroup Server User Guide") helps you install and configure your server setup and includes several test sites to get you started. (For more information about MySQL and PHP, see "Serve It Up," elsewhere in this issue.)

If you don't want to host these servers on your own hardware, many hosting companies also offer PHP and MySQL access, typically for a small monthly fee.

The Loose Ends GoLive 6 will ask for a few crucial pieces of information during the setup process. Make sure you have on hand the Web server's URL and the MySQL server's IP address or host name. You should also know the name of all databases your Web site will access, as well as their user names and passwords.

Once you have this information, you're ready to configure your GoLive site for dynamic content.

Connect to the Server

Just because you have Web and MySQL servers up and running doesn't mean GoLive 6 knows how to talk to them. Therefore, your next task is to teach GoLive where to find, and how to communicate with, your databases.

GoLive 6 consolidates all of its scripting controls and database-integration settings in a single Dynamic Content pane. To access this pane, open your Web site in GoLive 6. In the Site Settings window (Site: Settings), click on Dynamic Content.

If you don't see the Dynamic Content option in the Site Settings window, it's possible that someone has turned off the module to reduce GoLive's memory and processor needs. To turn it on again, open GoLive's Preferences (⌘-K), select Modules, and then activate the Dynamic Content Module option. Quit GoLive and relaunch the program.

The Dynamic Content pane has a wizard that steps you through the process of installing dynamic-content support on your Web server. As you choose options and proceed, GoLive installs scripts, runs



ILLUSTRATION BY ANDERS WENNGREN

tests, and offers tips for configuring the connection. (Although the Dynamic Site wizard is extremely helpful for setting up a new database connection, you can skip the wizard entirely if you already know what setting you need and want to save time. To access a bare-bones dialog box in which you can manually configure your site, click on the Cancel button after starting the wizard.)

Create a Connection To start the wizard for the first time, click on the Dynamic Site Wizard button in the center of the Dynamic Content pane. If you're returning to a configuration already in progress or you're creating a second configuration, you'll find the link for the wizard in the upper right corner of the pane.

In the first screen, choose PHP as the scripting language. This is the only language GoLive 6 supports for MySQL without additional ASP or JSP configurations. Next, specify which method GoLive should use to upload files to the Web server. GoLive can use the settings you've already defined for FTP or WebDAV file transfers. It can also use a local file path if your Apache server is on the machine that GoLive is running on.

To test your configuration, GoLive will attempt to retrieve files from your Web server as an outside user. But first, the program must know where your Web site lives. In the next pane, enter the URL that corresponds to the root level of your Web site. If your site is nested in a server subdirectory, make sure to specify the entire path to the site correctly (for instance, <http://www.macworld.com/~glenn/>). GoLive creates a new folder called "config" at the root level of your site and places important configuration files in this folder.

Once it has all the information it needs to connect to your site, GoLive tries to upload and retrieve the appropriate files for the scripting language you chose. If these files fail to upload or don't run as expected, GoLive reports an error and offers advice on correcting the problem. After you've taken the appropriate action, use the Test button to retry PHP until you get a clean bill of health.

If someone else is hosting your site, you may find that you don't have enough access to make the changes necessary to pass this testing stage. For example, some troubleshooting may require modifying the `php.ini` file, which contains systemwide choices for how PHP works. If this happens, you'll need to ask your service provider to make the changes for you; if it refuses, find a new provider with the needed PHP configuration.



FTP Time-Out If you receive an FTP Disconnect message while working in the Dynamic Site wizard, simply click on the Back button and then the Next button. This should refresh the server connection and upload the necessary files again.



Security Setup Once GoLive successfully uploads and tests your site's PHP files, the wizard opens the Security Setup screen. Here you can control access to the authoring features in GoLive, to ensure that unauthorized people can't reconfigure your site. You can choose one of three options for controlling access: Allow Only This Address, which GoLive fills with your local IP address; Allow Only This Subnet, which gives access to an entire local network; or Allow Anyone (see "Stay Secure"). The last option is dangerous because it lets anyone with a copy of GoLive 6 modify your database settings.

If you decide later that you want to change these access settings—adding multiple addresses or networks, for example—you'll have to make the changes by opening and editing the `friends.php` file (which you can find in the Config: Include subfolder at the root of your site). This file includes directions for adding addresses. Edit the file and then upload it to the server.

You should always make a backup of your `friends.php` file after you edit it. GoLive has an annoying tendency to overwrite this file, thereby deleting your custom access permissions. If you suddenly discover that you can't connect to dynamic content from a network that used to offer access, reload the `friends.php` backup copy to the server to restore your settings.

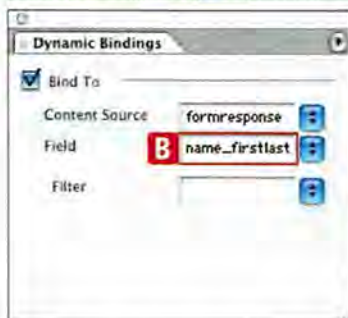
Connect to Your Database

Now that you've taught GoLive how to communicate with your server, you need to connect your site to the specific databases you'll use. To do this, you'll create *data sources*—login settings for accessing individual MySQL databases.

Create a Data Source In the Dynamic Content pane, go to the Data Sources section. To create a new data source, click on New, select the MySQL Database option, and then click on Add Data Source. (You won't be able to add or change data sources until the PHP support has passed its troubleshooting tests.)

In the resulting Add Data Source dialog box, enter a name for your new data source. GoLive uses this name to create a file in which it stores the setting for the new data source.

Stay Secure The Dynamic Site wizard's Security Setup screen lets you restrict access to GoLive's setup files. Allow Only This Address is your safest option.



Linking Content

To add dynamic content to a Web page, you must link form elements such as a name field **A** to the appropriate content source **B**.

Next, enter the MySQL database server's IP address or host name (mysql.website.com, for example), along with the appropriate port. The port identifies the server's specific location on a given machine. (Most MySQL servers operate on port 3306.) GoLive requires that you add the port to the end of the IP or host address, separated by a colon (for example, mysql.website.com:3306).

Set Security

GoLive will also prompt you to enter the database's name, as well as a user name and password that permit you to access the database.

Because GoLive's PHP scripts store the user name and password unencrypted on the Web server, it's wise to make sure every database has a unique user account with access restricted to specific databases—not open to the server as a whole. For sites in which visitors aren't entering information, you might consider disabling the database user's write permission. This way, if someone finds a database's user name and password, he can't wreak havoc with the rest of your settings. Although GoLive protects the database's user information, having unencrypted passwords on a Web server is always risky.

Test Data Access Once you've entered the settings for your data source, click on the Test button. If the process completes successfully, you should see a list of the tables within that database.

If GoLive reports errors, such as an inability to access the database server, double-check the access setting in your friends.php file. If that seems fine, verify that you've entered the correct database server address and individual database name and password, and that the database user has the appropriate privileges.

Add Content to Your Web Page

With all the necessary dynamic content files installed on your server, you're ready to begin inserting database content into your Web page. To create a page that automatically adds new subscribers to your MySQL database, you'll connect form elements to individual fields in a database table.

First, design an HTML page that includes a form with fields for a name, an e-mail address, a newsletter check box, and a Submit button (see "Linking Content"). Convert the HTML file to a PHP file by selecting Dynamic Bindings from the Windows menu and clicking on the Convert Page button.

Your data sources link the Web site to a specific database on the MySQL server. Now you need to link page elements to specific tables and fields within that database. GoLive calls these connections *content sources*, and you must create them for each page.

Drag a Content Source icon from the Objects palette's Dynamic Content tab into the Head section of the page. To create a new content source, select the Content Source icon in the Head section. In the Content Source Inspector, select the table you want to access. Create a name for the new content source and then select MySQL Database from the Type pop-up menu.

From the Database menu, choose the appropriate data source and then specify which table you want from the Table menu. GoLive now displays the fields associated with that table. (Experienced MySQL users can filter out the few fields they need from a large, unwieldy table by entering a SQL query instead of choosing a table name.) To use the same tables on multiple pages, you can save time simply by duplicating this page or copying the content source.

Once you've defined your content sources, all that's left to do is bind the fields in the table to individual form elements. Select a form element on the page—for example, the e-mail field. In the Dynamic Bindings palette, select the content source and then the field name. Repeat this process for each form element.

You'll use the Submit button to tell GoLive how to interact with your database. In this case, you want to use the information from the page's form elements to create a new record in the database table. In the Dynamic Bindings palette, click on the box next to Action and select Add Record from the pop-up menu below. Assign the content source. This palette also lets you redirect visitors to different Web pages for successful and unsuccessful database additions.

Once you've assigned all your content sources, resync the site to upload files. When users fill out your Web form, their information will automatically appear in your database—ready to use as a mailing list or link to other information.

Where to Go from Here Once you've mastered this basic Web form, you've learned the most complicated part of using GoLive 6 to integrate database content into a Web site. You can easily build on these skills to create different types of dynamic content—for example, templated catalog pages with product photographs, details, prices, and other information stored in your database. Once your Web site is properly configured to interact with your database, what you do with your dynamic content is up to you.

GLENN FLEISHMAN is a regular contributor to *Macworld* and the author of the *Practical Mac* column in the *Seattle Times*. This article is a modified excerpt from *Real World Adobe GoLive 6* (Peachpit Press, 2002), which he coauthored with Jeff Carlson. For more information about the book and a downloadable excerpt, visit <http://realworldgolive.com>.

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What Lies Beneath

I'll bet that when Apple's marketing mavens gathered to pitch slogans for Mac OS X, they discarded the motto "All the gnarliness of Unix!" in about two ticks. But let's face it, an indisputably challenging operating system lies beneath OS X's Aqua surface. With this in mind, we examine various OS X arcana—such as force-quitting Classic, renaming directories, commanding Terminal, and formatting with Unix File System—and look at some factors that will determine whether using OS X all the time makes sense for you.

A Classic Case

Classic often fails to quit when I shut down; when this happens, I have to invoke the Force Quit command from the Apple menu. Is there a way to do this from the Dock?

Fred Sandsmark, Macworld.com forums

By default, no. When the Classic environment first launches, an OS 9 icon appears in the Dock, but don't be fooled. This icon doesn't represent the

Classic environment; it represents the Classic Startup application, which can be found at System: Library: CoreServices. Once Classic has fully launched, the icon disappears.

Of course, selecting Force Quit from the Apple menu is not terribly inconvenient, and pressing ⌘-option-escape to conjure up the Force Quit Applications window is just as easy, but if your deepest desire is to force-quit

the Classic environment from the Dock, there is a way—the \$8 Classic? V2, from XGadgets (www.xgadgets.com). Once you install this utility, you can launch, restart, shut down, and force-quit Classic from the Classic? V2 icon in the Dock or from the Classic? V2 menu. (You can choose to install the dockling, the menu, or both.) Classic? V2 also provides access to Classic's control panels and allows you to rebuild the Classic desktop.

As for your general problem of an uncooperative Classic during shutdown, updating your version of

OS X may help. I had a similar problem with early versions of OS X 10.1. That problem no longer occurs when I run OS X 10.1.5.

Legal Name Changes

If I change the name of my hard drive, will iTunes and iPhoto forget the location of their respective libraries?

Kathy Thomas, Philadelphia, Pennsylvania

No. Although it's true that your Mac performs best when you refrain from renaming any folders created by Mac OS, renaming a volume or hard drive won't cause iTunes or iPhoto to lose track of their respective libraries.

What *will* seriously mess with OS X's mind is renaming the Applications, Library, System, and Users folders at the root level of your OS X volume (and if you don't have root privileges, you won't be able to rename these folders from within OS X). Likewise, if you rename the Utilities folder inside the Applications folder, applications such as Print Center won't be able to do their jobs. If you rename the Pictures folder inside your user's folder, iPhoto will launch with nary a photo in its library. And if you rename the Library folder in your user's folder, you'll lose preference settings for OS X and its applications.

Typical Terminal Commands

Is it possible to launch a program from Terminal?

Julian Wai, Macworld.com forums

Sure. Just use the Unix `open` command. If you want to launch the Calculator application, for example, you'd type `open /Applications/calculator.app`.

The `/` characters denote directories (or, if you want to think of it graphically, the folder hierarchy). What this command really says is "Open the Calculator



ILLUSTRATION BY LEO ESPINOSA

application in the Applications folder at the root level of the OS X volume."

Note the space between open and /. Without that space, the open command—or any command that moves you to another directory—won't work.

You can use the same command to open a folder: open /Users/chris/Pictures, for example, whisks me to the Finder, where my open Pictures folder awaits (a quicker way to do the same thing is to type open ~/Pictures—the ~ character is a shortcut to your users folder).

There are several other useful, easy-does-it Terminal commands you can type after the prompt:

cd (change directory) followed by a path moves you to a new folder: for example, cd /Applications/Utilities moves you to the Utilities folder inside your Applications folder at the root level of your OS X volume; cd / takes you to the root level of your OS X volume; cd without any following character transports you to your user's folder—Users: chris, for example.

pwd (print working directory) reveals the full path to your current location. For example, if I've been rummaging around in my user's folder, pwd displays /Users/chris.

ls (list) lists all the files in your current location. If I type this command while in my user's directory, all the folders found in a user's folder—Applications, Desktop, Documents, Library, Movies, Music, Pictures, Public, and Sites—are displayed, along with any other files I may have flung into my chris folder. To list the files in a different location, type ls and the path to the location you desire. ls /Applications, for example, shows you the contents of the Applications folder at the root level of your hard drive.

man followed by a command name produces the electronic manual pages for that command. For instance, typing man ftp produces line after line of instructions on using ftp with the flavor of Unix underlying OS X.

Never Clone Alone

I work in a college environment where I need to clone over 30 Macs with the same disk image that I created for the Mac lab. Is there an application that will allow me to do this?

Howard Yong, Macworld.com/forums

There are ways to do this in both OS 9 and OS X. Let's start with OS X:

In OS X, you can manage this kind of thing with Mike Bombich's donationware utility, Carbon Copy Cloner (www.bombich.com/software/ecc.html). This valuable tool allows

you to clone an OS X volume to another volume or drive (including an iPod)—though you can't clone to a CD-R or DVD-R disc.

To begin, just launch Carbon Copy Cloner, choose a source and a destination drive, and then select the items you'd like to copy from one volume to the other (see "Send in the Clone"). In a matter of minutes (up to around 30 minutes if you have a lot of files selected), the utility will create a bootable OS X volume that contains those items.

In OS 9, if the image is smaller than 640MB, you can simply burn the material you want to a CD-R and then copy the contents of the CD-R to each Mac. If you want this image to contain a System Folder that, when copied to each computer, will boot that Mac, turn to OS 9's Disk Copy application, which you'll find in the Utilities folder inside the Applications (Mac OS 9) folder.

Choose Create New Image from Disk Copy's Image menu, select 663,000K (CD-ROM 12cm, Full) from the Size pop-up menu in the resulting Save Disk Image As dialog box, give the image a name, and click on Save. When the disk image mounts, you'll be asked to initialize it. Do so using the default Mac OS Extended format.

Now insert the OS 9 installation disc, run the installer, and select the disk image you just created as the destination for the installation. Add the other material you want to the disk image and then burn the contents of the disk image to a CD-R. If the data you want to copy exceeds the capacity of a CD-R, copy the material to an external hard drive

and move from Mac to Mac, copying the data from the drive to the Mac's start-up drive.

Usable File System?

The OS X installer offers me the option to format my hard drive in the UFS (Unix File System) format. Are there any circumstances under which I'd want to do this?

"palomino," Macworld.com/forums

Regular ol' Mac users will find a UFS-formatted volume more hindrance than help. When Mac OS X is installed on a UFS volume, AirPort won't work. Nor can you change a hard drive's name. Nor will the Classic environment function the first time it's opened on a UFS-formatted volume. Nor will a



Send in the Clone

Carbon Copy Cloner allows you to create a bootable duplicate of your OS X volume.



TIP OF THE MONTH

When I choose the Open or Save command in OS X, I'd like to quickly navigate to the hard drives that appear on my desktop, as I can with OS 9. Unfortunately, the Desktop panes in the Open and Save dialog boxes don't contain volumes. To access

them, I must instead scroll the window all the way to the left. Here's a way around that:

Create aliases of your volumes in the Desktop folder (in your user's folder)—this places icons of the volumes on your desktop and in the Desktop portion of Open and Save dialog boxes. To eliminate the duplicate icons, select Preferences from the Finder menu and deselect the Hard Disks option under Show These Items On The Desktop.

Peter A. Hillman

UNSOLICITED ADVICE

Apple's QuickTime Pro 6.0 (\$30; 800/692-7753, www.apple.com) includes the Advanced Audio Coding (AAC) codec, developed by Dolby Laboratories—AAC can make audio files smaller and higher in quality than files produced using the MP3 standard. As we went to press, Apple's iTunes couldn't encode tunes with this codec, but it could play them.

To automatically bring AAC-encoded songs into iTunes, just download and run a copy of Doug Adams's \$5 Make Mine MPEG-4 AppleScript (www.malcolmadams.com/itunes) or Scott Nichol's free AACelerator (www.macmethod.com).

You may also want to try the manual method, which is also the general procedure for converting and encoding any QuickTime movie. Learn it, and you'll have a good idea of how to convert a MIDI file to AIFF, an AVI file to MOV, or a MOV file to WAV.

Insert an audio CD, launch QuickTime Player Pro (the free version of QuickTime doesn't allow you to encode files), select Import from the File menu, and navigate to the audio file you want to import. Now select Export from the File menu, and in the resulting Save Exported File As window, select Movie To MPEG-4 from the Export pop-up menu. Click on the Options button in this window; then click on the Audio tab in the MPEG-4 Settings window that appears, and move the slider so that 128 Kbps is selected (this bit rate sounds remarkably good yet keeps file size down). Click on OK to dismiss the MPEG-4 Settings window and then on Save to begin encoding your file.

Moving your AAC-encoded files into iTunes is a simple matter. Just launch iTunes and either select Add To Library from the File menu and select your files, or drag the encoded files to the iTunes Library window.

UFS volume appear on your Mac's desktop when you boot into OS 9. Nor can you use the type and creator codes beloved by all right-thinking Mac users to associate a file with an application.

Given all these *no's*, there's no reason on earth to format your drive as a UFS volume, unless you're developing Unix applications on your Mac. For that, UFS is the format you're likely to choose.

X Stands Alone

I purchased a new iBook, and I'm thinking of partitioning the hard drive and reinstalling OS X only. Can I do this and partition OS X using the installer CD, or must I install OS 9 and then install OS X?

Nadrell Evans, Macworld.com forums

To address your specific question, yes, you can partition your iBook's drive with the OS X installation CD and install just OS X—there's no need to install OS 9 if you don't care to. But your question brings up a broader question: Can modern Macs now function in a completely OS X environment?

Perhaps. Whether you can dispense with OS 9 and the accompanying Classic environment depends a great deal on what kind of duties your Mac performs. Run-of-the-mill Mac users who use their Macs for e-mail, Web browsing, moviemaking, music playing, and word processing can function quite well with

OS X-native applications such as OS X 10.2's Mail; Entourage (part of the \$459 Microsoft Office suite; 800/426-9400, www.microsoft.com); Qualcomm's Eudora (free with ads, \$40 without ads; 858/587-1121, www.qualcomm.com); any of a slew of OS X-native Web browsers; Apple's iMovie, iTunes, and \$79 AppleWorks (800/692-7753, www.apple.com); and Microsoft Word (\$370). And Adobe's (800/833-6687, www.adobe.com) OS X support in applications such as Illustrator (\$400) and Photoshop (\$600) will keep most graphic artists happy in a completely OS X environment (though an unsupported scanner or printer may force these users into OS 9 from time to time).

On the other hand, if you depend on QuarkXPress (\$900; 303/894-8888, www.quark.com) to get your pages to print, you're still staring at OS 9's Platinum interface. Likewise, musicians seeking a wide variety of OS X-native professional sequencing and digital-audio tools have a while to wait.

Inconsistent FireWire Booting

I recently purchased a portable FireWire hard drive and would like to use it to boot my Mac, but sometimes it boots and other times it does not. What can I do to consistently boot from this drive?

Kent Holubar, Redwood City, California

My fervent prayer is that by the time you read this, booting from a FireWire drive will no longer be an inconsistent exercise. Among its many wonders, that hepcat OS X 10.2 (Jaguar) allows a wider variety of FireWire devices to boot your Mac. Previous OS X versions had a problem doing this because some FireWire-bridge chip sets—for example, the Texas Instrument chip set found in SmartDisk's FireLite drives (www.smartdisk.com)—could interrupt the boot process and keep the drive from mounting. Those drives using the Oxford 911 chip set often had greater success booting OS X 10.1.

If you haven't upgraded to Jaguar and your Mac has problems booting from a FireWire drive, try unplugging the drive when the Mac seems incapable of booting (you'll see a broken folder icon), wait about five seconds, and then plug the drive back in. That five-second pause is crucial: failing to wait may cause the Mac to crash with a kernel panic. I've been able to boot my Titanium PowerBook G4 running OS X 10.1.5 by following this procedure. □

Beneath his crunchy exterior, Contributing Editor CHRISTOPHER BREEN is the oh-so-sensitive author of *Mac 911* and *Secrets of the iPod* (Peachpit Press, 2002).



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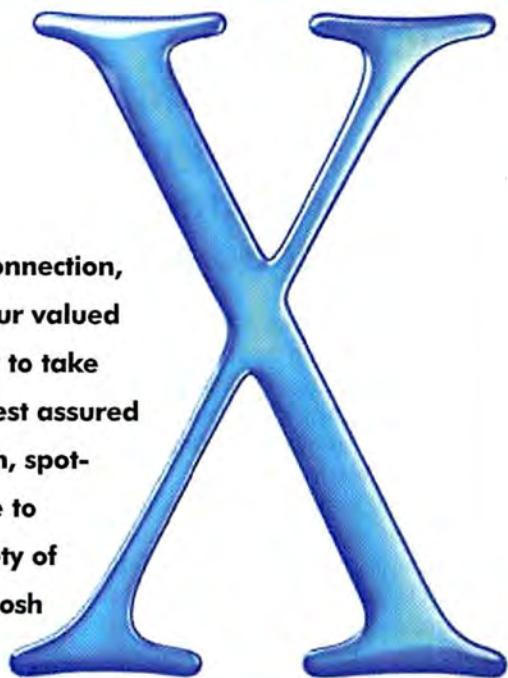
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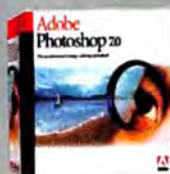
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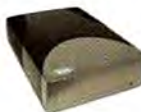


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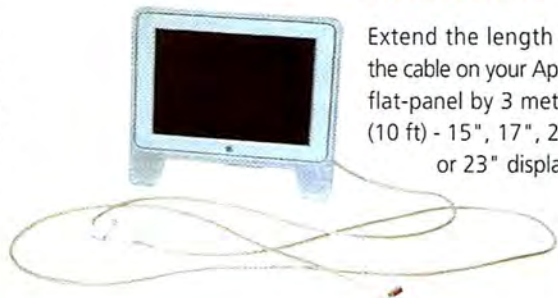
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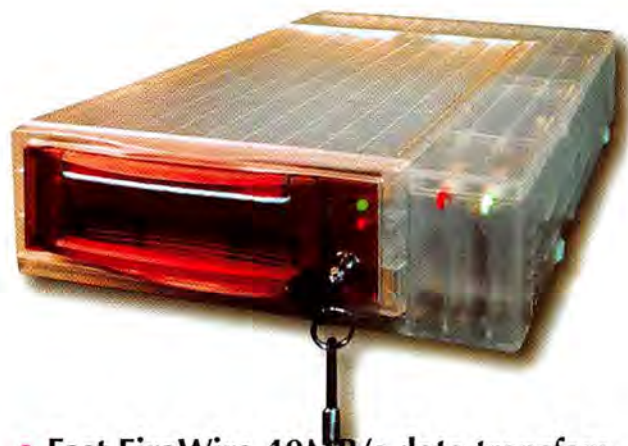
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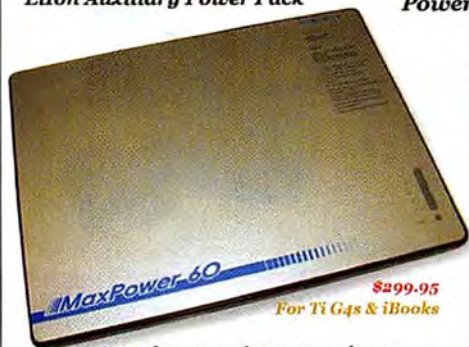


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Grade 1 Sheet - 175 line Kodak film included.

		2500	5000	10000	15000
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	4/4	\$130	\$190	\$350	\$490
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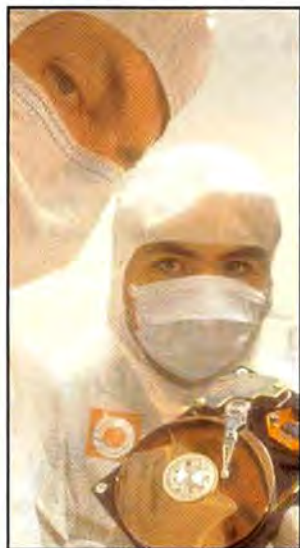
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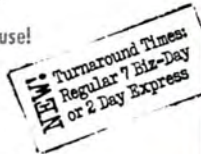
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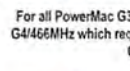
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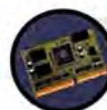
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to go out and *look* for available file servers? If my PowerBook is within AirPort range, shouldn't its hard drive automatically be included in a file search from my desktop? And let's try not to think about the awful, *awful* way Apple is explaining iSync. I was there when Steve Jobs demonstrated this "amazing, proof-of-alien-visitation" technology that *actually* lets you synchronize the address and calendar information from your desktop to your PDAs. I was smiling and nodding indulgently, as I do when my elderly aunt eagerly tells me that I should check out this wonderful new Web site called "eBay."

Think instead about that same AirPort-equipped PowerBook. Why should I have to spend time synchronizing my contacts, project files, Web bookmarks, and so on, between that thing and my desktop? Can't they put their heads together and figure it out on their own? Sure, someday, thanks to iSync and Rendezvous. And just a few weeks after the keynote, I got a new Toshiba PocketPC e740: it's no larger than a conventional PDA, but it has built-in AirPort-compatible networking. Dare I imagine an iSync doohickey that will *finally* give PocketPC equal footing with Palm on the Mac?

iSync should be better than HotSyncing. My data should be synced automatically, the moment I pull into the driveway, thanks to Rendezvous. Then we'll have something.

The smartest thing about Rendezvous, though, is the fact that it's just Apple's trademarkable, T-shirt-worthy name for an open standard called zero-configuration networking. There are some things Apple doesn't get and maybe never will, but the power of a good open standard isn't one of them.

Microsoft's people still can't get their heads around this concept. When they decide that a good computer acts as a conduit for information, they say, "So if we build and control the standards for this basic conduit, we could control . . . the world!" The result is .Net, which isn't getting a lot of traction and has recently been co-opted by the open-source community.

"Great! This will only increase the relevance of .Net as a standard!" Microsoft's people respond, sounding suspiciously like the independent bookseller who reacts to the sight of a Barnes & Noble megastore under construction a block away by first insisting that it'll turn his neighborhood into a trendy "book district," thus bringing in loads of new business—and then by studying the ingredients of a T.G.I. Friday's Blender Blaster. □

Contributing Editor ANDY IHNATKO finally got a chance to chat with Steve Jobs at Macworld Expo. The two didn't actually talk, but Andy managed to look at the tab on his jeans. Expect a new pair of pants for the holidays, Mr. CEO.

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iSync and Rendezvous Aren't Sexy, but They're Vital



Mayor Jobs's Action Plan

MY IMMEDIATE REACTION TO STEVE JOBS'S KEYNOTE AT July's Macworld Expo was that Apple's CEO might finally be ready to graduate from the role of high-powered technology executive to that of mayor

of a sufficiently industrialized major city. The skill that separates one-term mayors from mayors so good that they wind up with their own Food Network series is the ability to make boring but important news sound exciting.

Sure, it's easy to win the attention and support of voters when you're working with your A material: "We've bamboozled the federal government into giving us \$14 billion to turn all our ugly downtown overpasses into tunnels that will run underneath 50 acres of new parkland, there's a good chance that we can get Tony Bennett to be grand marshal of this year's Columbus Day parade, and it turns out that most of that stripper's testimony against me is inadmissible!" It's another matter entirely to comb your hair, adjust your tie, and then go on TV to announce that you're spending 40 million taxpayer dollars to improve a sewer system that's already perfectly adequate for the city's needs.

So it was quite a test when Jobs strode to the center of that big stage in Manhattan and showed off Mac OS's new sewer system: Rendezvous and iSync.

Hooray, Infrastructure!

Perhaps we're entering a time in the Mac's development when we've got to pay for all of Apple's spectacular product announcements of the past few years. Steve Jobs's rotating hydraulic platform has repeatedly levitated above the Macworld Expo stage to reveal great stuff—you know, like a desktop Mac made out of half a volleyball attached to an Etch A Sketch. That big projection screen behind Jobs has shown us a brand-new operating system that looks like a 1970s Hanna-Barbera cartoon, only with a lot more on-screen animation. And with every tick of the clock and visit to Apple's Web sites, we seem to get another great piece of free software that thrills and delights Mac users while sending commercial developers of consumer media software into fits of apoplexy (and then into a nearby T.G.I. Friday's to seek some form of employment stabler than Macintosh software development).

It's all pure Tabasco. Don't get me wrong. I loved Sherlock 3 (even when it hadn't yet been written and was called Watson) and I'm eager to get my hands on iCal (even though it means that the next Bloomin'

Onion I order will probably be served by the guy who wrote the calendar application I'm using right now).

But neither of those programs is an exciting peek into the Mac's future. Neither is Mac OS X, not anymore—it's now officially the Mac's present.

No, you can spy the *future* direction of the Mac through Rendezvous and, to a lesser extent, iSync. The ground keeps shifting under the feet of technology companies; a set of priorities that would have served a company well during the Clinton administration ("Acquire and hold on to the greatest number of desktops!") offers slippery footing during Bush: The Sequel. Somewhere between the time when the Smashing Pumpkins stopped and Bruce Springsteen resumed making records, the most important priority became creating the best and most reliable way to connect users with various sources of information.

One of the butt-kickingest features added to Mac OS in the past couple of years has been support of XML-RPC and SOAP. "*Blurgh?*" you ask. Yes, you probably don't know about these acronyms, and that's precisely how it should be. XML is a universal format for structured data (and much more, but why confuse things?); XML-RPC and SOAP are Net protocols that allow two pieces of software on two different machines to hand data back and forth, almost as if they were part of the same program.


These technologies make apps like Sherlock 3 not only possible but also actually useful. The new technologies let you attach Machine A, which lists what's playing at every theater in America; Machine B, which shows movie trailers; and Machine C, which turns street addresses into maps—all behind the scenes of your easy-to-use Sherlock movie plug-in.

Anybody Out There?

Then there's Rendezvous, the ultimate glue: "If two devices can talk to each other," says Apple, "then, um, they *can* talk to each other, thanks to Rendezvous." It affects operations that are just plain operatic in scale, the kind that make us question our faith in a kind and loving God, such as setting up a network printer, and it also makes us wonder why even the simple stuff isn't simpler. Why, necessarily, do I have to tell the Finder

It's easy to win an audience when you're working with your best material.

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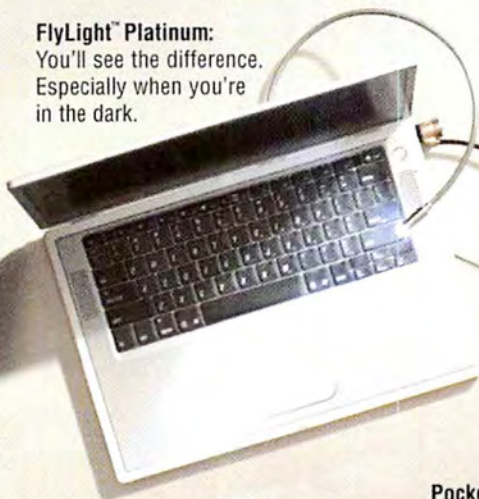
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