Macworld

OS X 10.1

GOOD TO GO

PLUS
Apple's Faster PowerBooks and iBooks
Lab Tested: Two New iMacs
DVD Burners, DV Camcorders Reviewed
Move Your Web Site to XHTML
Barrett Sanders, Editor for Evergreen Films.

"Thanks to Final Cut Pro, I now have two complete high-end editing systems, without spending a lot of money. The program offers me a level of polish and professionalism I've never experienced before." Barrett first saw the capabilities of Final Cut Pro two years ago, and his comment at the time sums it all up nicely: "This is going to completely change production as we know it."

Learn more at apple.com/finalcutpro.
It's jam-packed with Mac tools.
The robot arm, though, that's just for show.
OS X Comes of Age

JASON SNELL The first release of Mac OS X was a radical change, but it was seen as a step backward by many Mac users. With the new version, 10.1, Apple fixes many of the original's problems—both improving existing features and adding new ones. Has OS X finally grown up?

Data to Burn

JIM HEID Read our review of six DVD-R/RW drives that bring DVD-burning power to us all.

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Double Dose
MATHEW HONAN With Mac OS X 10.1 and a slew of rewritten applications, have we entered the era of Mac multiprocessing?

Turn Your Cassettes or LPs into CDs
JONATHAN SEFF Transform your dusty old records into a CD collection you can listen to anywhere.

Office Remodeling
TOM NEGRINO When it comes to adoption of OS X, available native software is high on many requirement lists. With Office v.X, Microsoft brings the first killer app to OS X. Here's a look inside.

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I'd rather create clocks than invoices. If I wanted to keep books all day, I'd have been an accountant.

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Antique frames. Quartz movements. That's my business. MYOB software works for me.
DeCEMBER 2001

Forums and Feedback

The Pleasure Is Ours
Nothing pleases us more than making our readers happy. Likewise, nothing displeases us more than upsetting them—and many of you were a little miffed by the September issue's "Save Your Data" feature, which recommended Dantz Retrospect but didn't mention that program's incompatibility with Apple's internal CD-RW drives. Other readers were just as peeved about Apple's product announcements at Macworld Expo New York. But fortunately, everyone still seems happy with Andy Ihnatko—and we couldn't be more pleased.

Back Up a Minute

Much of “Save Your Data” (September 2001) was helpful and clear, such as the part called “The Best Backup Device,” but I beg to differ on a few points. The only backup software you mention is Dantz's Retrospect. I've tried to use Retrospect for years, and it has never made sense to me. Connectix's Copy Agent allows disk mirroring—a technique you didn't mention, though I predict it will become the norm in the near future. Or what about online backup services such as BackJack? Although it's not cheap, it's simple, safe, and reliable. Thanks for the fine article. If only I had read it before my 60GB drive containing 12 years of work failed.

I could not believe my eyes when I saw that you'd given Retrospect your highest rating, because Retrospect doesn't support the standard CD-RW drive Apple puts in its G4s. Retrospect is obviously flawed. What other software product do you know of that won't work on a standard Power Mac G4 but still gets a top rating, which says, in essence, “This is a must-have piece of software”? I'm hoping we can put some pressure on Dantz to get this white elephant fixed and some pressure on Macworld to revise its rating. The bottom line for me is that Retrospect has been a great program and a good supporter of the Mac platform; unfortunately, Dantz has dropped the ball and is taking too long to pick it back up. When Dantz releases a fix or an upgrade, I'll probably buy it. But I would've thought a Mac magazine of your reputation would inform readers of this problem, especially when you devote several pages to backup solutions and prominently feature Retrospect as one of the best.

The article focused on Retrospect because it is by far the dominant backup program on the Mac. All other Mac backup options are essentially unchanged since our previous comprehensive backup article (“Be Safe, Not Sorry,” February 1999). We definitely should have mentioned Retrospect’s incompatibility with Apple’s internal CD-RW drives. It is Macworld’s policy to refer to appropriate software reviews; that's why we referred to the five-mouse rating we gave Retrospect long before the release of Macs with internal CD-RW drives. When Dantz ships the next version of Retrospect, expect a new review that takes into account any incompatibilities that may exist at that time. In September, Dantz announced Retrospect support for Apple's internal CD-RW drives.—Ed.

iMac: 2; Expo: Nothing

The new Power Mac G4s look really cool (“Mac Beat Special Report: New Apple Products,” September 2001), and I’m glad to see that Mac OS X is getting an upgrade, but I was still a little disappointed. I had hoped to see some new iMacs.

Another Way to Flash

There’s a small problem with the preloader-creation tutorial that Russell Chun gives in “Ease the Wait with Flash 5” (How-to, September 2000), as there is in many such tutorials I’ve seen on the Web. Although this tutorial is easy to understand and demonstrates the way most people first create a preloader in Flash with ActionScript, the results are neither stable nor accurate. Also, if you have more than one scene in your movie, the frames-loaded method can be troublesome: for some reason, Flash can end up either dumping you into the movie before it's finished loading—continues
this happens especially when there are bitmap images in the body of the movie—or deciding that your movie never loaded and leaving you on the loading page with a full “fuel gauge” but nowhere to go. For a far more elegant and solid way of doing the same task, and to produce a preloader that truly lets users know how much of the movie has loaded and how far it has to go, Macromedia Flash 5 users should use the getBytesLoaded and getBytesTotal properties.

For an explanation of how to perform this technique, see the Magazine Feedback forum on Macworld.com.—Ed.

 Stranger in a Strange Land  

**ANDREW STONE (FOUNDER AND CEO OF STONE DESIGN)** Thank you for your review of Stone Studio (September 2001). We’d like to correct one possible misunderstanding: text is completely editable in Create simply by double-clicking on it (a Cocoa standard) using either the text tool or the selection tool. This includes text that has multiple fills and strokes, text that has been placed along a path, and text that has been placed within or around other objects. We’d also like to note that Create is not intended to be a Macromedia FreeHand or Adobe Illustrator clone. In one low-priced package, it includes major illustration, page-layout, and Web-publishing features. Create is not wedded to older interfaces and technologies; since it was built from the ground up using Cocoa, it’s structured to take advantage of all the features built into Aqua and Mac OS X, including future features when they’re added to the system. Macworld constantly advises against upgrading to Mac OS X and insists there is “no software.” If you face backward as you approach thefuture, always comparing it to the old tools of a prior generation, it may look strange. But if you turn around and embrace the future, you’ll find all the magic it has to offer.

**JIM DEMAS** Deke McClelland writes that “[Stone Studio’s] creators have little idea what today’s artists expect from a graphics program. Traditional editing and navigation shortcuts go unobserved, the type tool lets you create text but not edit it, and there is no such thing as a context-sensitive pop-up menu.” In Create, text is fully editable. Just double-click on it and then use either the text tool or the selection tool. This text editing can be done with text that has strokes, text that has multiple fills, text that has been placed in or around objects, and text on a path. Double-clicking on text is a standard Cocoa convention. Apparently, Mr. McClelland is not as up-to-speed on Cocoa or OS X as he ought to be.

Selecting a type tool and clicking or dragging inside text is a standard observed by a host of publishing applications—but not by Create. I am not aware of any OS X convention that calls for an end to using a type tool to edit text.—Deke McClelland

**A Not-So-Perfect 10?**

**KENT LUFKIN** FreeHand (Reviews, September 2001) is one of two or three applications I depend on to make a living. Although FreeHand 10 includes exciting new features such as master pages, it no longer supports dynamic font-menu updates under Mac OS 9 or earlier—a glaring problem if you regularly switch fonts on and off. When FreeHand 10 is launched on Macs running OS 8.6 or 9, fonts activated or deactivated with a utility such as Adobe Type Manager, Font Reserve, or Suitcase will not appear in any FreeHand font menus until you quit and restart that application. A Macromedia tech-support person confirmed that font menus do update dynamically when FreeHand 10 is run under Mac OS X, but that an apparent conflict with CarbonLib prevents this longtime feature from working properly on non-OS X machines. I applaud Macromedia for being among the first on the block to launch a mainstream graphics application that runs natively under OS X. But while OS X intrigues me, I’m not inclined to risk potential disruption of my business by converting to it until I’m positive it’s ready for prime time.

**Andy Ihnatko, Master Craftsman**

**ALAN ULLMAN** Andy Ihnatko made some great points (“Making Great Software,” Ihnatko, September 2001), but when he used BBEdit’s ability to search and replace FileMaker data via an AppleScript as an example of BBEdit’s strength, he missed a great opportunity: to provide the script! I’ve long wanted a simple way to search and replace in FileMaker databases.

**MARY JO DISLER** How I agree in principle with Mr. Ihnatko’s column. Why can’t companies just maintain some of the simple, direct apps of yesteryear? After yet another frustrating session trying to master style sheets in AppleWorks 6, I long for the simplicity and efficiency—not to mention the small RAM footprint—of good old MacWrite Pro. Unlike Andy, I do need some basic formatting capabilities for day-to-day work, and MacWrite Pro easily manages all I need. For example, AppleWorks 6 takes three mouse clicks to change a style, versus MacWrite Pro’s one.

This is progress? My plea to software companies: Please maintain the best of the basics as single applications, and let customers choose either those or the bells-and-whistles versions. Think of the benefit for new computer users as well as for us longtimers who just want to get some work done.

**CORRECTIONS**

The price of Adobe Illustrator 10 upgrade is $149 (“Here Come the Killer Apps,” Mac Beat, November 2000).
Sharp, colorful pictures. Minute detail. Subtle degrees of shadow. True, natural color. These are the things that drive us to create the very best digital cameras. Our latest is the CAMEDIA C-4040 Zoom. An f1.8 zoom lens. 4.1 megapixels. Noise reduction. Auto-Connect USB ease. Creative control. It will help you see things in new ways. Transform the ordinary into art. And capture the most realistic digital images yet. Nothing’s impossible.
Double Your Pleasure

OS X ADDS MULTIPROCESSING POWER—NOW ALL YOU NEED ARE THE APPLICATIONS

Every time a dual-processor Mac arrives on the scene—whether it’s the 1996 Power Macintosh 9500/180 MP or the Power Mac G4/500 DP that appeared four years later (“Double Vision,” November 2000)—Mac users hail the advent of multiprocessing. But all dual-processor Macs have faced the same hurdle: users won’t enjoy significant performance gains unless they’re using applications specifically written to take advantage of multiprocessing.

With Mac OS X, though, all of that should change.

For the first time, there is a universal benefit for all Mac users who purchase a dual-processor machine: large parts of OS X have been designed to take advantage of multiple processors. Unlike previous versions of Mac OS, the new operating system divides various tasks between processors, whether applications are MP savvy or not.

Working Together

In OS 9, MP applications split their tasks between two processors. But most applications run on only one processor, and the OS has no way to divert tasks to the second CPU. When one chip reaches the limits of its processing power, applications that are MP optimized are not able to send some of their work to the other chip.

Work gets divided differently in OS X. The operating system can send different programs to different processors, splitting the work more efficiently. This doesn’t translate to system performance that’s twice as fast as it would be with only one chip, but it does mean that one processor will reach its limit more slowly as other, non-MP-savvy programs are launched.

Some applications are OS X native and MP savvy. Quake III is perhaps the best example of this (see “Twin Engine”). Rather than having to work on just one processor while other programs run on the other, Quake III can split its tasks up, sending the work of game play to both processors at once. Therefore, the operating system does not have to “assign” Quake to one processor or the other.

Doubled Up

A number of major Mac applications have been written to take advantage of multiprocessing and run natively in OS X. And more are on the way.
MP Ready?
All this talk of multiprocessing has raised a frequent question among visitors to Macworld.com’s forums: Now that Mac OS X has arrived, should I run out and buy the dual-processor 800MHz G4? The answer is largely the same as it was a year ago—an unequivocal maybe, leaning toward yes.

Although numerous processor-intensive programs have been optimized for multiprocessing (see “Doubled Up”), most of these applications have yet to be Carbonized, let alone written in OS X’s Cocoa programming application.

Users running a multiprocessing-enabled application in OS X’s Classic mode will see some benefit, though not the performance boost you could expect from an MP-savvy OS working in tandem with an MP-savvy program. An MP-enabled application running in Classic on a dual-processor machine should be faster than the same program running on a single-processor Mac. But its performance will lag behind that of a dual-processor machine running OS 9.

While the dual-processor Mac makes much more sense for someone who uses an MP-savvy, processor-intensive app that runs exclusively as an OS X-native program, that’s not a universal experience. The dual-processor Mac isn’t much more attractive now than it always has been to a user running a non-mp application in Classic. It’s only slightly more appealing than it used to be for those who work mainly in MP-savvy apps that have not yet been Carbonized.

As more programs become Carbonized, the dual-processor Mac will become an increasingly attractive option. Users who are making their Mac purchases with long-term use in mind and who place a premium on performance would be foolish not to consider a multiprocessor machine, because eventually every significant Mac application will switch to OS X.

Even without these programs, though, dual-processor machines boast certain advantages. An MP system sports two cache buses and double the cache size of a single-processor Mac. It also offers a performance boost by efficiently running multiple applications at the same time.

Mac users have heard about the wonders of multiprocessing for years. The arrival of OS X 10.1 may finally mark the beginning of multiprocessing’s glory days, especially for high-end Mac users. But with more OS X-native and MP-enabled applications slated for the future—and multiprocessor machines with CPUs that top 800MHz sure to follow—it may take some time before a majority of Mac users are seeing double.—MATHEW HONAN


Macworld’s online archives offer an extensive look at the history of multiprocessing and the Mac.
PowerBooks, iBooks Get Boost

At a time when most computer makers are struggling, Apple's iBook and Titanium PowerBook G4 have been remarkable successes. And updated versions, unveiled in mid-October, now make these laptops even more compelling.

**PowerBook**

Viewed from the outside, the new PowerBook G4s look much the same as their predecessors. But inside are serious speed improvements, particularly on the new high-end model. Powered by a 667MHz G4 processor and a 133MHz system bus, it's one of the fastest Macs—desktop or laptop—Apple has ever built.

The other new PowerBook, powered by a 550MHz processor, uses the same 100MHz system bus built into previous PowerBook G4 models. Both variations offer 256K of Level 2 cache, a drop from the 1MB of cache in the original PowerBook G4.

However, that cache now runs at the speed of the processor, not at half the speed, as with previous models.

Hard-drive capacity has also been boosted in these two models, to 20GB in the 550MHz PowerBook and 30GB in its 667MHz counterpart. Space-hungry users can choose a 48GB drive instead, via Apple's Web site, and the company will also offer a slot-loading CD-RW drive as a built-to-order option.

The video subsystem of the PowerBooks has also been markedly improved. Gone is the ATI Rage Mobility 128 graphics processor that's been around since the days of the PowerBook G3. Instead, these new PowerBooks come with ATI's Mobility Radeon AGP 4X graphics system, allowing for improved DVD playback and faster graphics on some 3-D games and applications.

Both new PowerBook configurations offer built-in Gigabit Ethernet (10/100/1000BaseT), an improvement...
Apple's New Laptops

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over the 10/100BaseT Ethernet support in the original Titanium PowerBook G4. The 667MHz model even comes with a built-in AirPort card.

These models are less expensive than the previous versions, too. At $2,199, the 550MHz PowerBook G4 sells for $400 less than the 400MHz configuration introduced in January. The 667MHz model sells for $2,999, compared with $3,499 for the 500MHz PowerBook G4 unveiled earlier this year.

iBook Like the PowerBook, the consumer-friendly iBook doesn't look much different—but there have been speed boosts inside. While Apple still offers an iBook configuration with a 500MHz G3 processor, the company has added two new models with 600MHz CPUs to the mix. In addition, the 600MHz iBooks include a 100MHz system bus, as opposed to the 66MHz bus in other models.

Memory and storage space have both been bumped up in this update. All iBook models now come with the Mac OS X minimum of 128MB of RAM and are expandable up to 640MB. The base hard drive configuration has risen from 10GB to 15GB.

And as with the PowerBook G4, these new iBooks are slightly less expensive than their predecessors, with prices ranging from $1,299 to $1,699. - PHILIP MICHAELS

Mac Stuff

The Writing on the Wall

Unless your life's ambition is to destroy thousands of dollars' worth of perfectly good hardware, it's not a wise move to take a pen and scribble on a plasma display. However, with the Smart Board for Plasma Displays, from Smart Technologies (888/427-6278, www.smarttech.com), drawing on a 40-inch plasma display is no longer the act of a madman—it's an effective communication tool. Similar to devices that attach to whiteboards and capture anything you write, the Smart Board is an overlay that fastens to the front of a plasma display. As you press on the overlay with one of the Smart Board's "pens"—which actually contain no ink at all—you register a contact point with the Smart Board software running on your Mac, making electronic ink marks as you move the pen. Every mark you make can be saved, printed, or e-mailed. With prices ranging from $3,299 to $4,999, the Smart Board overlay isn't cheap. But it's less expensive than taking a Magic Marker to your plasma display the next time your muse pays a visit.—PHILIP MICHAELS

PDA

What to look for: Check expandability—can you connect with add-on devices, as well as memory and application cards? Also, you'll need to decide between color displays and the typically less expensive gray-scale models.

What you'll spend: $100 to $450

What we'd buy: Palm m505 (★★★★); $449; Palm (800/881-7256, www.palm.com)

Why: The m505 is light and thin, with a color screen that'll make your season bright.

Read our review: September 2001

CD-RW Drive

What to look for: Speed and ports are key, and make sure the drive comes with Sanyo's BURN-Proof technology to avoid buffer underruns.

What you'll spend: $200 to $400

What we'd buy: 16X10X40X U&I Drive (★★★); $300; LaCie (503/844-4500, www.lacie.com)

Why: It features USB and FireWire ports, as well as the all-important BURN-Proof technology.

Read our review: August 2001

MOUSE

What to look for: Size matters. So does the number of buttons—and where they're located on the mouse.

What you'll spend: $10 to $150

What we'd buy: PocketMouse Mobile Optical Mouse (★★★★); $30; Kensington (800/235-6708, www.kensington.com)

Why: It's tiny and portable with a Rudolph-like optical light to guide it.

Read our review: Macworld.com

www.macworld.com December 2001 23
TechTool Pro 3 is the super utility for your Macintosh. Besides repairing and recovering data, TechTool Pro can help you circumvent problems in the first place. Our new virus detect and repair feature, as well as our software conflict check feature, lets you keep your computer in tip-top shape. When booted from the included emergency CD, you can even check, repair and optimize your OS X computer.

Every day, more and more Macintosh professionals are choosing TechTool over other system utilities. In fact, even Apple Computer includes TechTool Deluxe with every copy of their AppleCare Protection Plan. Simply put, TechTool Pro 3 is the most complete and powerful troubleshooting utility available for your computer. Why would you settle for anything less?

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 OS X’s native environment.

While Drive 10 is a new product, it is derived from TechTool Pro, Micromat’s world-class diagnostic and repair utility. Using TechTool’s time-tested routines as well as some new routines developed exclusively for OS X, Drive 10 offers many tools for checking and repairing any drive on your system. Don’t entrust your OS X drive to ancient utilities. Protect your data and drive safely with Drive 10.
**Accounting for Change**

For MYOB (800/322-6962, www.myob.com/us), the ability to manage a small company from a Mac is serious business. To that end, it released MYOB Accounting in late 2000 to fill the void left by Intuit’s decision to stop updating the Mac version of its QuickBooks business-management product.

Now comes MYOB’s next salvo in the fight to win former QuickBooks users and new small-business customers—an updated version of AccountEdge for the Mac priced at $249. Existing users can upgrade for $99 before November 30, or for $119 afterward. AccountEdge 2.0, which could be available by the time you read this, streamlines some administrative tasks while expanding the flexibility of other features.

**Getting Started** A new Company File Assistant reduces the setup process from eight steps to five. An Easy Setup Assistant walks users through setting up payroll, purchases, sales, accounts list, and customization features, letting them skip sections that don’t apply to their business. “We more or less tore down what we had before and created a new way of navigating through the setup,” says Tom Nash, director of product management.

**New View** Interface changes include the addition of more drop-down menus. AccountEdge's Report Center now offers brief descriptions and sample views of each of its 150 reports. Most important, users can now choose to enter transactions and view accounts in a Quicken-like Bank Register.

**Old Features, New Tricks** MYOB has made existing features more flexible, extending the capability of tools within AccountEdge. Users can insert lines, headers, and subtotals to customize the look of invoices. Packing slips printed in AccountEdge can now include orders. And credit-limit warnings, formerly available only on invoices, can be set on quotes and orders.

**Take It to the Bank** AccountEdge users who download bank and credit card transactions online can now import that data. AccountEdge matches it with existing transactions in the register; users can then review, fix, and enter any unmatched transactions. Version 2.0 supports most online-banking data formats including QIF, OFX, and Microsoft Money OFC.—PHILIP MICHAELS

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**HARDWARE**

**COMPUTERS**
- An OS X-compatible wireless trackball from Kensington Technology Group (800/280-8318, www.kensington.com): The Turbo Mouse Pro Wireless trackball ($120) has six Direct Launch buttons, four programmable mouse buttons, and a scroll wheel.

**DIGITAL CAMERAS**
- Two digital cameras from Olympus (800/622-6372, www.olympusamerica.com): The Camedia E-20N ($1,999) is a 5-megapixel camera that also lets users set a progressive scan mode of 2.5 megapixels. The Brio D-230 ($299) is a 2-megapixel camera.

**DISPLAYS**
- A lower-priced pen display from Wacom (800/922-9348, www.wacom.com): The Cintiq 15X ($1,900) costs $2,000 less than its predecessor, the PL500. The Cintiq 15X combines a full 24-bit color LCD display with a cordless, battery-free pressure-sensitive pen. The 15-inch active matrix color TFT display with 1,024-by-768-pixel resolution is equivalent to that of a 17-inch CRT monitor.

**INPUT DEVICES**
- New mice from Microsoft (800/426-9400, www.microsoft.com): The Wireless IntelliMouse Explorer ($75) is Microsoft’s first wireless optical mouse. Microsoft also released a wired version of the IntelliMouse Explorer ($55) with enhanced grip support, finger grooves, and a new shape, as well as a new version of the IntelliMouse Optical ($45). All three mice come with enhanced versions of Microsoft’s Intelli-point driver software.
- New OS X-compatible wireless trackball from Kensington Technology Group (800/280-8318, www.kensington.com): The Turbo Mouse Pro Wireless trackball ($120) has six Direct Launch buttons, four programmable mouse buttons, and a scroll wheel.

**ANNOUNCED**
- The purchase of Cleaner 5 by Autodesk (800/669—continues)
1. Steve Jobs compares progress in the transition to Mac OS X to a clock's hour hand. So when the clock strikes midnight, do all Macs running Mac OS 9 change into pumpkins?

2. Instead of charging a shipping fee for the OS X 10.1 update, Apple makes a free version available at some stores. But if you still feel like mailing $19.95 off to someone, the Mac Beat staff will send you a lovely thank-you note in return.

3. Windows XP was set to ship on October 25. Guess they celebrated Halloween a week early in Redmond this year.

PRODUCTIVITY SOFTWARE
- FileMaker Developer 5.5, from FileMaker (800/325-2747, www.filemaker.com): The database software aimed at developers and workgroup database administrators adds features from FileMaker Pro 5.5, such as OS X compatibility, along with database-design, report, and script-debugger tools, and updated ODBC drivers ($499; upgrade, $399).

GRAPHICS SOFTWARE
- Canvas 8, from Deneba (305/596-5644, www.deneba.com): The update to the illustration and page-layout software runs on both OS 9 and OS X 10.1. New features include advanced automation capabilities and a file-sharing component called DenebaShare ($400; upgrade, $200).

UTILITY SOFTWARE

MAC OS X UPDATES

Adobe SVG Viewer X 3.0b2
Browser plug-in to view SVG files
Agfa ScanWise X 2.1
Beta software for the SnapScan line
Apple Macintosh Manager 2.0.3
OS X Server client-admin tools
ConceptDraw Professional 1.7
Expanded graphic formats from standard version of diagramming application
Corona 1.5.1
Accounting and payroll application
Dantz Retrospect client 1.0.425
Beta of OS X client for backup software
Divx for X 1.1.2
QuickTime divx/3ivx component
FoldersSynchronizer 2.2b9
Beta tool to synch and back up files and folders
iView Media Pro 1.2
Adds import options, fixes bugs in asset-management application
Keyspan USB adapters 1.0b8
OS X driver for USB serial adapters
Lexmark X63.1.44
Drivers for the X63 multifunction printer
MacDoppler Pro X 1.7.0
Amateur radio application
Maxum Rumpus 2.0
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Stone Studio 9-2001
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Super Get Info 1.0.2
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Test Pilot 4.0.3
Creates tests and surveys for delivery and collection over the Internet
TimeSlicer 2.2.2
Adds Edit Fee feature to billing application
Unsupported UtilityX 2.0b1
Helps install Mac OS X on some unsupported Macs (the Power Mac 7300 to 9600 series, and equivalent clones)
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Painter 7
Carbonized Graphics Application Adds Realistic Watercolor Tools

BY BEN LONG

ADOBE PHOTOSHOP MAY BE THE current image-editing program of choice, but when it comes to painting, nothing compares to Procreate's Painter, which has long been renowned for natural-media tools that convincingly simulate the look and feel of real-world painting and drawing tools. Painter 7 adds realistic new watercolor brushes to its predecessor's already impressive toolbox, and it's the first fully Mac OS X-compatible version of the program. But while the ability to run a major graphics application in Mac OS X is exciting, the program's lackluster performance in the new operating system will likely drive you to reboot in OS 9.

More of the Same
With version 6 (★★★★), then-owner MetaCreations gave Painter a streamlined new interface—a marked improvement on its predecessors' huge, screen-gobbling palettes. Procreate (a division of Corel) has Aquafied version 7's interface for OS X users, but overall the program's look has changed little.

If you've never used Painter before, getting started can be daunting; learning your way around the palette-driven program, with its hundreds of tools, may take some time. For example, Painter includes 17 brushes, each with variants that change how the brush performs. In addition, each brush has a slew of parameters that allow you to create custom variants.

Fresh Watercolors
Painter has had watercolor brushes since its first release, but version 7 sports a completely rewritten watercolor engine that produces incredibly realistic results. In previous versions, watercolor brushes painted onto a single "wet" layer of a document. This layer stayed wet—meaning that watercolor strokes could interact with each other—until you chose the Dry command. With version 7, you can create as many wet layers as you like. You can even use the new watercolor...
tools to manipulate imagery created with “dry” tools, by moving the contents of dry layers onto wet layers.

Real-world watercolors consist of granular paint pigments suspended in water. As you move your brush across paper, these particles diffuse into water spread by the brush, as well as into water already on the page, mixing and bleeding into other colors. Painter 7’s new watercolor engine simulates this process and includes several new parameters that let you control how “water” spreads, dries, and evaporates.

To use the watercolor tools, you simply grab a watercolor brush and start painting; Painter automatically creates a new wet layer for your strokes. By controlling the Wetness and Pickup parameters, you can change how a stroke expands across your virtual paper, as well as how your current color mixes with and leaches into existing wet colors. Other parameters let you control the speed at which paint spreads on the page.

In addition to yielding startlingly realistic results, Painter 7’s watercolor tools are fun to use. Select a really wet brush, and you can watch the virtual water and pigment drip and spread across your page in real time. Because Painter actually simulates the physics of water and pigment, the program includes special Wind parameters that you can use to alter the gravity of your canvas. These controls let you tilt your canvas and blow on your strokes to spread the colors.

All this sounds processor intensive, and it is. Procreate recommends a G3 or higher, and you’ll want the fastest clock speed you can afford—and at least 128MB of RAM—if you plan to do a lot of high-resolution watercolor work.

Liquid Inks and Other Effects
Painter 7’s other major addition is the Liquid Ink feature, which lets you paint with a thick, gooey ink. Like watercolors, Liquid Inks go on their own layers. As strokes pass near each other or intersect, color blobs and spreads, as real ink does. And Liquid Ink goes on in layers, like a thick oil paint, so you can create realistic built-up strokes. This feature is similar to Painter’s Impasto tools, but there’s no limit to how many layers you can have or how high the ink can build.

The Liquid Ink and watercolor tools are the biggest new features in Painter 7, but this version offers other additions (such as nonprinting perspective grids) and many improvements. For example, while Painter has always allowed tools to interact with an underlying paper texture, version 7’s tools are sensitive to the direction of the paper’s grain: a stroke in one direction (with the grain) might lay down more ink than a stroke in the other direction (against the grain).

The Text tool is also greatly improved. A single palette lets you control everything from fonts to drop shadows to text on a curve. Painter’s main weakness in terms of text is its continued inability to apply colors to individual characters.

The program can now open and save RGB or CMYK Photoshop files with full layer support; it also offers JPEG and GIF preview options for selecting compression parameters. Perhaps the best enhancement is that you can now use Painter’s scripting feature to execute a stroke repeatedly in a selection, giving you a quick and easy way to add cross-hatching, textures, and patterns.

Fast, Accurate, and Under Control
Painter 7’s updated color-management facility offers full support for ICC profiles. The single Color Management dialog box makes it easy to select scanner, monitor, and printer profiles and to specify a document color space; a separate dialog box lets you control the handling of documents saved in other color spaces. When you’re printing or moving documents from Painter into an image editor, version 7’s new color-management tools should make it much easier to maintain consistent color.

Although we were very pleased with Painter’s performance on a 400MHz G4 PowerBook running Mac OS 9.2.1, we were eager to see if the program would run even faster in OS X 10.1. Alas, using Painter 7 is a very different experience in the new OS: brush strokes are slow to render, tools respond sluggishly, and the program is generally less tactile than in OS 9.

For example, Painter’s Sharpen filter took almost twice as long to work in OS X as in OS 9, as did the Apply Surface Texture and Rotate commands. Script performance was particularly bad in OS X, ranging from three to six times slower than in OS 9. Oddly, when we launched Painter 7 in OS X’s Classic mode, performance approached normal OS 9 speeds. Procreate is aware of the problem and is working on optimizing the program to bring it up-to-speed in OS X.

Although Painter 7 is usable—and very stable—in OS X, the performance hit OS X causes is too great. For now, you’re better off booting directly into OS 9 or running Painter in Classic mode.

Macworld’s Buying Advice
With its new watercolor tools and dozens of other enhancements, Painter 7 doesn’t disappoint in the painting department. And if you already rely on Painter, the new tools and improvements make this upgrade worthwhile. But for Mac users longing to make the transition to OS X, version 7’s performance in the new operating system is a bigger deterrent.
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Capable New 600MHz and 700MHz Models Are More of the Same

BY CHRISTOPHER BREEN

Apple's latest iMacs could inspire some differing opinions. Some may celebrate the idea that with the new 600MHz iMac, Apple provides almost the same machine it released earlier in 2001 (Reviews, June 2001), but with more RAM, a bundled copy of Mac OS X, and a more traditional color scheme—all for $200 less than the previous 600MHz model. These same people will likely cheer for the new top-of-the-line iMac, the $1,499 Special Edition (SE), which runs at 700MHz and, like the 600MHz model, includes 256MB of RAM.

Others, however, may wonder if Apple isn't coasting just a bit with this release. They might suggest that the iMac—now three years old and counting—is ready for changes somewhat more substantial than a faster G3 processor, a greater RAM allotment, and a roomier hard drive. They might also question whether a 100MHz-faster processor and a 20GB-larger hard drive really make this Special Edition "special."

We believe that the truth of the matter lies somewhere between these divergent viewpoints.

Few Changes

If you've used an iMac built during the past year, you'll find no surprises in the new models. Each of these iMacs includes two USB ports, two FireWire ports, a VGA port for mirroring video on an external monitor (at the same three resolutions available to the iMac), a 10/100BaseT Ethernet port, a slot-loading 8x4x24 CD-RW drive, a 56K modem, an internal microphone, an audio-input and -output port, two internal speakers, an Apple Pro Keyboard, and an Apple Pro Mouse. Both iMacs include a welcome 236MB of RAM and an ATI Rage 128 Ultra graphics board with 16MB of VRAM, and either model is available in snow (white) or graphite (dark gray).

The reasonably beefy software bundle has changed little since the last iMac iteration. Apple's iTunes (and a rich collection of more than 11 hours of spoken-word and music MP3 files), iMovie 2, and AppleWorks 6 are preinstalled, as are FaxSTF 6, Quicken 2001 Deluxe, and three games from Pangea—Nanosaur, Bugdom, and the Flintstones-era driving game Cro-Mag Rally. On our 600MHz model, the bundled copy of Mac OS X was continues
You Don't Bring Me Flower Power

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<th>Reference system in italics. Best results in bold.</th>
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<th>QUAKE III V1.29F</th>
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Speedmark 2.1 scores are relative to those of an iMac Special Edition 600MHz (OS 9.1), which is assigned a score of 100. Quake scores are in frames per second. iTunes and Movie scores are in minutes:seconds.

We tested each system with its preinstalled OS, the standard shipping RAM configuration of 256MB, a default system disk cache, and virtual memory enabled. We set displays to 1024-by-768-pixel resolution and 8-bit color. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long and converted it using a default setting of 160 Kbps in iTunes. We tested Quake at a resolution of 640-by-480 pixels, with graphics set to Normal. Macworld Labs testing by Ulysses Bravo and James Galbraith.

included on the Software Restore CD; the 700MHz iMac offers it on a separate disc. According to Apple, the system software that ships on all the new iMacs will be included on one Software Restore CD. We'd prefer that this weren't the case, as it prevents users from choosing where and how to install OS X.

The limitations of this Software Restore CD scheme become apparent when you attempt to restore a single application from the CD. In short, it can't be done. Regrettably, except for the Pangea games—which can be restored from a separate Applications disc—you can't reinstall copies of the bundled applications individually. Rather, you must restore all the hard drive's contents—erasing the hard drive (or partition if you've partitioned the drive) in the process.

Although the Software Restore CDs allow Apple to more easily protect its software from unauthorized distribution, they're far too limiting and cumbersome for users. In the future, Apple might address this shortcoming by including an installer that would allow users to reinstall only selected applications—without jeopardizing the contents of their hard drives. In the meantime, those who purchase one of these iMacs might be wise to put the CD-RW drive to good use and burn backup copies of each application and its support files.

Fair Gains

For the most part, the two iMacs performed as we expected. The new 600MHz model slightly outpaced the 600MHz Flower Power iMac SE, due to updated drivers in the version of OS 9.1 bundled with the new system. The new, 700MHz iMac SE produced the best scores—though none of its scores are really earth-shattering. In our Speedmark tests, for example, the 700MHz model bested the new 600MHz iMac by only six percent. The new iMac SE also squeezed out an extra five frames per second in our Quake III test. And in our iTunes MP3-encoding test, the iMac SE crossed the finish line nine seconds earlier than the 600MHz iMac. But considering this iMac's 100MHz-faster processor, we'd hoped to see greater gains.

We had also hoped Apple would include faster CD-RW drives in these iMacs. Although the included drives are adequate, their 8x write speed is rather slow—modern CD-RW drives often boast write speeds of 24x. We pray that the next iMac release will include faster media drives.

Mac OS X

Although Macworld Lab doesn't currently support an official suite of OS X tests, we were eager to get a feel for how these new iMacs performed with Apple's next-generation operating system. Although both were a bit sluggish with OS X 10.0.4, they fared far better with OS X 10.1. (Systems built before OS X 10.1's release ship with earlier versions of OS X installed, yet these machines come with an OS X 10.1 installation CD.) On the new 600MHz iMac, AppleWorks launched in a single bounce, and Microsoft Internet Explorer 5.1 appeared after a mere two bounces. Even the Microsoft Word X Test Drive application, a version not yet completely optimized, was reasonably snappy. It launched in just three bounces and felt responsive—a great relief to us. Given OS X's ability to utilize the Altivec functions of the G4 processor, we had wondered if a G3 processor could do OS X justice. With OS X 10.1 and these iMacs, our fears have been laid to rest.

Macworld's Buying Advice

These iMacs are perfectly capable computers that perform well enough for all but the most demanding users. Both iMacs turned in respectable scores in our Speedmark, Quake III, and iTunes tests, and they seemed to handle Mac OS X 10.1 with aplomb. The software bundle covers the basics and offers some compelling multimedia applications. The 236MB of included RAM is welcome, the CD-RW drive—though no speed demon—is useful, and while Apple has offered more-attractive iMac color schemes in the past, we can't say that we're sorry to see the last of Flower Power and Blue Dalmatian.

While the 700MHz iMac Special Edition is the fastest iMac ever produced, we expected more from it than slightly better performance and a higher-capacity hard drive. For that additional $200, you might expect a G4 processor or an Nvidia graphics board. We hope that the next iteration of the iMac Special Edition (and all iMacs, for that matter) will be truly worthy of the word special.
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Those who don’t own a digital-video camcorder are missing out on one of the best reasons to own a Mac. All of Apple’s Mac models, even the least-expensive iMac, have built-in FireWire ports and iMovie software, making the creation of professional-looking videos for business, home, and school projects very easy.

Until now, digital-camcorder prices were prohibitively high, and the lower-priced models had only the most-basic features. But as with all technology advancements, camcorders’ best features have migrated down to the latest entry-level models. We compared three of those models—the Canon ZR25 MC, the Panasonic PV-DV101, and the Sony DCR-TRV17—that can be had for less than $1,200.

Why DV?
All the camcorders we tested use MiniDV tapes, tiny cassettes that store 60 minutes of high-quality digital video in standard-play mode or 90 minutes in long-play mode. Once you record your video, you can upload it to your Mac via a FireWire cable (sold separately) and edit it using either Apple’s iMovie or a higher-end program such as Apple’s Final Cut Pro or Adobe Premiere.

The DV format—used by DV, MiniDV, and Digital 8 cassettes—stores video at more than twice the resolution of standard VHS or 8mm tapes, and it stores 25 percent more information than S-VHS or Hi8 tapes. Color fidelity and noise immunity are also markedly better on DV tapes than on analog tapes, resulting in breathtaking video quality. And because the recorded video is digital, you can upload it to your Mac or copy it to another DV tape without any loss of quality.

How They Feel
The Panasonic PV-DV101 was the most affordable model we looked at but also the lightest on features. Although it’s a bit bulky, resembling a standard 8mm camcorder, its size allows for a 20x optical zoom lens. Two notable features also make it easier to use: the intuitive zoom control and the simple tape-loading mechanism. The zoom control on the PV-DV101 consists of two buttons operated with one finger each. The other two camcorders have a smaller, up-and-down lever that’s operated with a single finger.

The PV-DV101’s simple tape-loading slot pops open and allows cassettes to be loaded from the top. In contrast, the more-compact camcorders load tapes into a mechanical contraption—with cautionary stickers advising you to press here but not there—that’s accessed via clamshell covers on the underside of each camcorder.

How They Work
Although its simplicity allows for a price hundreds of dollars lower than Canon’s ZR25 MC and Sony’s DCR-TRV17, the PV-DV101 lacks many desirable features. Like the ZR25 MC, it has a 2.5-inch color LCD screen, but its viewfinder is a black-and-white monitor inside a fixed-length tube that extends well past the camcorder housing—presumably to accommodate the optional higher-capacity batteries. In contrast, both
the DCR-TRV17 and the ZR25 MC have color viewfinders in an assembly that extends or collapses, depending on the size of your batteries. You can also charge batteries in the DCR-TRV17 and the ZR25 MC, a convenience not offered by the PV-DV101 and many other Panasonic camcorders, which rely on a separate charger module.

And the ZR25 MC offers much more. It can capture still images using progressive scans rather than interlaced scans, which can lead to jagged photographs of moving objects. In addition to tape, you can store still images on MMC (MultimediaCard) or SD (secure digital) cards, although that feature is of little use to Mac users; you need to copy the stills to tape before you can upload them to your Mac. Another annoyance is the absence of a lock on the ZR25 MC’s switch for selecting card or tape mode; if it’s accidentally bumped into card mode, the camcorder won’t record motion video. The DCR-TRV17, which can also record still images to memory cards, has a pop-out lock on its selector switch to prevent this from happening.

The ZR25 MC can shoot in wide-screen mode, with a 16:9 aspect ratio. When shot in this mode, images in the viewfinder will appear somewhat squashed, though they’re recorded correctly on tape. The DCR-TRV17 can also shoot video in wide-screen mode, and it letterboxes video in the viewfinder and on its LCD screen, so you see everything in the proper aspect ratio as you’re filming. And like the other contenders, the ZR25 MC has a microphone on its front rather than on its top; the result is better sound than that of other compact camcorders. The ZR25 MC’s only flaw is that the port covers are flimsy and could break off after extended use.

The Sony DCR-TRV17 falls in the middle in terms of size but not features. It not only feels sturdier and more solid than the PV-DV101 and the ZR25 MC, but also has a 3.5-inch color LCD screen that’s markedly clearer than the others’ 2.5-inch screens. The DCR-TRV17 can capture still images to Sony’s proprietary Memory Stick cards, which mount as a virtual disk on your Mac’s desktop. And if you’re using Mac OS X, the Image Capture application will load these images automatically. The DCR-TRV17 also includes a USB port and cable for connecting the camcorder to your Mac.

Another handy feature is the DCR-TRV17’s Night Shot mode: an infrared transmitter lets you film in total darkness from as far away as ten feet. Images recorded this way are black-and-white with an eerie green tint, but they’re surprisingly clear. And the DCR-TRV17 provides a fairly accurate real-time estimate of remaining battery life, based on current usage conditions. Our only beef with the DCR-TRV17 is that you have to swing out its LCD display to access the playback controls.

If you’re upgrading from an analog camcorder or have analog footage that you want to convert to or import as digital video, you need a camcorder with analog-video inputs. Both the ZR25 MC and the DCR-TRV17 offer such inputs, allowing you to record analog video to MiniDV tape. However, the DCR-TRV17 can also convert analog video directly to a DV stream that can be imported to your Mac—no tape required.

**How They Performed**

In our tests, all three camcorders produced high-quality video, though the DCR-TRV17 had an edge on detail and color when recording in less than perfect lighting conditions. And all three worked flawlessly with iMovie on our iBook: they were directly controllable from iMovie, which had no trouble recognizing each camcorder’s start-and-stop recording sessions as separate clips.

All three models also offer digital-image stabilization, which eliminates some of the jerkiness in videos filmed without a tripod. The PV-DV101 goes a step further: its dual-image stabilization can also steady movies while you’re playing them back.

**Macworld’s Buying Advice**

All three contenders performed well, but we favor the tiny Canon ZR25 MC over the bulky Panasonic PV-DV101—for $200 more, you get a color viewfinder, a built-in battery charger, and wide-screen-recording capability. For another $300, you can get all this and more in the Sony DCR-TRV17, which has enough bells and whistles to quell your camcorder envy for many years to come.
Forget about CD burners. Today’s optical drive of choice is a DVD burner, which lets you create video discs that play in most consumer DVD players. With Mac OS X 10.1, you can also use your DVD burner to back up files through the Finder. And of course, you can burn CDs using CD-R or CD-RW media.

The DVD-burning trend began when Apple added the SuperDrive to its top-of-the-line Power Mac G4. Designed and built by Pioneer, the SuperDrive is included in the top two G4 system models.

But you don’t have to buy a new desktop Mac to get a DVD burner. Several storage vendors now sell external drives that contain the same Pioneer mechanism and connect to a Mac or Windows computer via FireWire. Although they’re not called SuperDrives, they are super drives.

Macworld Lab tested six external DVD burners: the DVD-R/RW+CD-RW FireWire Pro2, from APS Tech; the DVD Revo, from CD Cyclone; the ClubMac FireWire DVD-R/RW, from ClubMac; the Boa FireWire DVD-R/RW, from EZQuest; the LaCie DVD/CD Rewritable Drive, from LaCie; and the Que Fire DVD Burner Pro, from QPS. While our stopwatch says the drives are virtually identical, they differ in other ways, including price, case design, and bundled software (see “DVD Burners Compared”). The $699 QPS Que Fire DVD Burner Pro provides the best mix of value and design, while CD Cyclone’s $1,049 DVD Revo is overpriced and unable to play commercial DVD video discs.

Fast Burn
We expected all six drives to perform similarly, and they did: in our tests, each drive turned in results that were within a few seconds of its competitors’ (see “Benchmarked Burners”).

The one exception was an original SuperDrive that we tested for comparison purposes. In DVD-burning tests, it was twice as slow as the newer units. The slowdown was due to the brand of media we used for testing. Early SuperDrives support double-speed DVD burning with only three brands of media: Apple, Pioneer, and Verbatim. With other brands—we used Mitsui—early SuperDrives downshift to single-speed DVD burning.

Pioneer has since addressed this issue, and mechanisms containing firmware version 1.44 or later support double-speed burning on a wide assortment of media brands. Alas, Apple has no plans to release a firmware update for its pioneering SuperDrive customers.

The Case for Good Design
Each DVD burner has a unique design, and some designs are better than others. The QPS Que Fire DVD Burner Pro takes the size prize—its case is only slightly larger than the drive mechanism itself, and because the drive uses an external power supply, the case lacks a noisy fan. The Que Fire drive also includes a padded carrier.

The DVD Revo drive also uses an external power supply, but the remaining four use internal supplies that contain fans. The quietest of these four fans is the one in EZQuest’s Boa, which has a sturdy, silvery case. The
Mac model include bundled software

We also burned DVDs with each drive

All of the drives we tested work with

through the Mac’s audio circuitry—

You Can Burn but Not Author

All of the drives except the ClubMac model include bundled software for burning; however, the LaCie and the APS drives include only Windows software. The best bundle accompa-

nies the DVD Revo, which includes Windows software and Roxio’s Toast 5 Titanium. The Que Fire DVD Burner Pro includes Windows software and Toast 5 Lite.

To create DVDs that will play in a set-top player, you need authoring software for creating menus and encoding video into MPEG format. The Windows software that accompanies some drives includes simple authoring tools, but none of the drives include Mac authoring software. Unless Apple releases a stand-alone version of iDVD that supports third-party burners, you will have to use the $999 DVD Studio Pro for authoring.

The Pioneer mechanism in these drives is capable of playing back commercial DVDs. But CD CyClone’s DVD Revo can’t play DVDs that are encoded for specific geographic regions, as most commercial DVDs are. CD CyClone is planning a software update to address this problem.

Macworld’s Buying Advice

The only drive we can’t recommend is CD CyClone’s DVD Revo—it’s expensive and unable to play back commercial DVDs.

Of the remaining five, the QPS Que Fire DVD Burner Pro provides the best mix of value and performance. Its $699 price tag is the lowest of the bunch, its padded carrier is a nice plus, and its software bundle is good—although serious users will also want to spring for the full version of Toast 5 Titanium.

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>PRODUCT</th>
<th>MOUSE RATING</th>
<th>COMPANY’S ESTIMATED PRICE</th>
<th>OS COMPATIBILITY</th>
<th>CONTACT</th>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD CyClone</td>
<td>DVD Revo</td>
<td>$1,049</td>
<td>Mac OS 9, Mac OS X</td>
<td>714/247-0999, <a href="http://www.cdclycclone.com">www.cdclycclone.com</a></td>
<td>Includes Mac authoring software.</td>
<td>Expensive; unable to play commercial DVDs.</td>
<td></td>
</tr>
<tr>
<td>EZQuest</td>
<td>Boa FireWire DVD-R/RW</td>
<td>$799</td>
<td>Mac OS 9, Mac OS X; Toast 5 Titanium</td>
<td>714/694-0031, <a href="http://www.ezq.com">www.ezq.com</a></td>
<td>Rugged case design; includes Windows software and Toast 5 Titanium*.</td>
<td>Somewhat noisy fan; poor documentation.</td>
<td></td>
</tr>
<tr>
<td>LaCie</td>
<td>LaCie DVD/CD Rewritable Drive</td>
<td>$889</td>
<td>Mac OS 9, Mac OS X</td>
<td>503/844-4502, <a href="http://www.lacie.com">www.lacie.com</a></td>
<td>Includes Windows burning and authoring software.</td>
<td>No Mac software included; noisy fan.</td>
<td></td>
</tr>
<tr>
<td>QPS</td>
<td>Que Fire DVD Burner Pro</td>
<td>$749</td>
<td>Mac OS 9, Mac OS X</td>
<td>800/559-4777, <a href="http://www.qps-inc.com">www.qps-inc.com</a></td>
<td>Includes Mac authoring software.</td>
<td>No Mac software included; noisy fan.</td>
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</tbody>
</table>

* Bundled software does not run on Mac OS X.
Small workgroups of graphic artists seeking a large-format color proofer and comping device found it in Epson's Stylus Pro 5000, a breakthrough printer when it was released a few years ago. With the 5000's successor, the Stylus Pro 5500, Epson has included the photographic and fine-art market in its scope.

The 5500 offers great print quality, excellent performance, and long-lasting prints while retaining the characteristics that made the 5000 an exceptional graphic-arts printer.

Archival Inks and Speed
The Epson Stylus Pro 5500's primary enhancement is the use of pigment-based archival inks—similar to the ones found in Epson's Stylus Photo 2000P—that Epson claims will last more than 200 years when used on specific Epson papers. The device uses six inks and has a maximum print resolution of 2,880 by 720 dpi. Depending on print size and ink coverage, its four high-capacity ink cartridges can produce from 150 to 1,000 prints each. The 5500 can handle page sizes as small as 4 by 6 inches and as large as 13 by 19 inches.

Overall, the Stylus Pro 5500 is close to twice as fast as Epson's consumer ink-jet printers. A 5-by-7-inch photo that took 4 minutes and 22 seconds to print at 1,440 dpi on a Stylus Photo 1280 took 2 minutes and 20 seconds on the 5500. An 11-by-17-inch image took almost 20 minutes to print on the 1280, but it took only 8 minutes and 30 seconds on the 5500.

The 5500's print quality is superb; images printed on Epson's new resin-coated photo semigloss paper are crisp and vibrant, rivaling traditional photographs. Matte-finish and watercolor paper is also available, and the 5500 prints satisfactorily on plain paper. We also printed from a variety of graphics applications, including QuarkXPress and Adobe Illustrator, Photoshop, and InDesign. The 5500 isn't a PostScript printer, but its high resolution and consistent color allow it to create comps that come very close to a final proof. (Epson will offer a $995 software-based PostScript RIP for the 5500 by the end of this year.)

Metamerism Be Gone
Epson claims that the 5500's smaller ink droplets (the smallest ink dot is 3 picoliters) prevent the color-shift problems that afflicted the 2000P when printing neutral-toned or black-and-white images. This phenomenon—known as metamerism—causes a print to look different depending on lighting conditions. Our tests corroborated Epson's claims: images that exhibited a severe color shift when printed on a 2000P showed significantly less metamerism when printed on a 5500. It isn't entirely gone—metamerism is a characteristic of pigment inks—but the 5500's output is much more balanced than Epson's earlier pigment ink-jets.

The only problem we encountered with the Stylus Pro 5500 was a relatively minor one—an occasional paper jam when we used the manual-feed slot on the printer's back. Another annoyance is that if you're using Mac OS X, you'll have to wait until the end of the year for a print driver with only limited features. And a full-featured driver won't be ready until Carbonized versions of Photoshop, Illustrator, and QuarkXPress are released.

Macworld's Buying Advice
For heavy-duty prepress comping, the Stylus Pro 5500 is unbeatable. Its archival inks, excellent print quality, and great performance make it a fine choice for artists and photographers, as well as graphic artists.
Software-Updating Utilities
UpdateAgent X, TechTracker Pro Keep Your Software Collection Current

BY FRANKLIN N. TESSLER

The Internet makes it easy for vendors to release software patches and revisions, but keeping track of changes can be a full-time job. Two new Carbonized applications, Insider Software's UpdateAgent X 10.0.4 and TechTracker's TechTracker Pro 1.2 for OS X, relieve the drudgery of searching for updates.

Cost of Entry
UpdateAgent X checks the applications and other software on your hard drive against an online database. A one-time update costs $10; $50 buys you unlimited access for a year. There's also a $90, two-CD set containing 1.3GB of recent updates.

TechTracker Pro scans as many as three Macs for out-of-date software. The program is free, but to use it you must register with VersionTracker Pro, which costs $50 a year. In addition to offering free services, VersionTracker Pro lets you access a custom Web page that tracks revisions to any subset of your software, distinct from the updates TechTracker Pro supplies.

Customized Updates
UpdateAgent X lets you scan all your drives or a single volume. You can also program the software to run unattended and either shut down your computer or put it to sleep when the scan is done. In contrast, TechTracker Pro examines all your disks at once and lacks a scheduling feature.

Although TechTracker Pro was slightly faster, both applications ran smoothly and took only a few minutes to inspect a 30GB hard drive containing more than 80,000 files. And both utilities found most of the same updates, although UpdateAgent X didn't inform me of a major upgrade to Adobe Premiere.

UpdateAgent X's results list distinguishes between free updates, consisting of bug fixes and enhancements, and upgrades, which you generally purchase from the vendor. You select the updates you want, and UpdateAgent X downloads their installers to your computer from Insider's servers.

TechTracker Pro's file view surpasses UpdateAgent X's in several respects. For example, a pop-up menu lets you specify the software you want to monitor, and you see two version numbers for every item—one for the software you have, and one for the update. Buttons next to the menu let you filter out applications, control panels, and extensions from the list, although I found it hard to tell when the buttons were selected. Unlike UpdateAgent X, TechTracker Pro retrieves updates from each vendor's server; that could potentially be less reliable, although I didn't encounter any significant glitches.

Macworld's Buying Advice
Even though it's less exhaustive, UpdateAgent X is a competent, inexpensive utility ideal for most home or SOHO users; the $10, one-time-only version is especially economical. If you want to find as many updates as possible, TechTracker Pro may be the better choice. With either program, you'll save hours of valuable time.

(Note: Macworld has a marketing relationship with TechTracker and publishes a list of VersionTracker updates in each issue.)

TECHTRACKER PRO
1.2 FOR OS X
Rating: ★★★½
Pros: Finds more software updates than UpdateAgent X; e-mail and Web-based notification of updates.
Cons: No scheduling feature.
Company's estimated price: $50 per year
OS compatibility: Mac OS X

UPDATEAGENT X 10.0
Rating: ★★★½
Pros: Customized scheduling; distinguishes between free and fee-based updates; inexpensive.
Cons: Overlooks some updates.
Company's estimated price: $10 to $90
OS compatibility: Mac OS 9, Mac OS X
room to burn
Need more space? Try a digital solution. Back up your data, even burn all your video, MP3s and multimedia presentation files onto CD. You can even create your own personalized jewel cases for each disc. Anyone can do it with Toast® 5, by Roxio. The best selling CD burning software in the world for the Mac. Use a PC? Look for Roxio’s Easy CD Creator® 5.
A financial program needs to make bookkeeping tasks easier than using pencil and paper, and it has to offer rock-solid reliability.

In Quicken 2002 Deluxe, market leader Intuit adds some great new features that improve the program's already excellent utility and ease of use, particularly for online banking and investment purposes. Compared with the mature Quick, Appgen's Moneydance 3.2 is a callow youth that just can't keep up; with its many user-interface deficiencies and crippling bugs, it isn't worth your money.

**Still Quick on Its Feet**
Surely the most important change in Quicken 2002 Deluxe is that it runs natively in Mac OS X, although it still runs in OS 9.0.4 or later. As a Carbon application, it sports the Aqua look-and-feel throughout and gives snappy performance in OS X 10.1.

This version still isn't as feature-rich as its Windows kin, but the gap is closing. Mac-based businesses would appreciate a Home and Business version like the one Intuit offers for Windows; with its project-tracking, invoicing, and accounts-receivable features, it has just enough accounting oomph for small businesses. Such a version for the Mac would bridge the gap between Quick, a personal-finance manager, and MYOB AccountEdge (Reviews, March 2001), a full-featured accounting package.

**One Step Update**
A feature long enjoyed by Windows users but new to the Mac, lets you perform all your online transactions with one click. You can download banking data and credit card transactions, send bill payments, and get stock quotes in a single session rather than connecting to each financial institution separately. PIN Vault, another new feature, stores all the passwords or PIN numbers for your different online accounts. Like the Mac OS's Keychain, this feature lets you access everything with one master password.

Another terrific new feature for online banking users is automatic checkbook reconciliation. After downloading your transactions, the program checks the online balance against your Quicken register. If they match, Quicken reconciles the account; if there's a problem, you're given the opportunity to reconcile them manually.

Quicken 2002 adds transaction downloading from brokerages—a great convenience, especially if you do a lot of trading. You can download information on purchases, sales, and dividend payments for stock and mutual funds. You can't initiate a new transaction, such as a stock purchase, within Quicken; you'll have to do that at your broker's Web site.

**Investing at Your Fingertips**
Quicken's new ability to download investment transactions frees you from onerous data entry and helps eliminate errors.

At the moment, Quicken supports only two online brokers—TD Waterhouse and Fidelity Investments. If you have accounts with E-Trade, Charles Schwab, Datek, or other brokers, you will have to wait; Intuit is working with these firms to enable the service. You can update the list of participating companies using the Financial Institutions window. Another investment aid is the new Capital Gains Estimator: enter your tax rate, and it shows you the tax consequences of selling one.

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**MONEYDANCE 3.2**
- **Rating:** ⭐⭐
- **Pros:** Works identically on different platforms; Aqua look-and-feel.
- **Cons:** Limited feature set; useless QIF import; inferior data entry; online banking not available for Mac OS 9 users.
- **Company's estimated price:** $40
- **OS compatibility:** Mac OS 9, Mac OS X
- **Company:** Appgen, 800/231-0062, www.moneydance.com

**QUICKEN 2002 DELUXE**
- **Rating:** ★★★★
- **Pros:** Carbonized; easier online updating; automatic account reconciliation.
- **Cons:** Doesn't yet support most online brokerage accounts.
- **Company's estimated price:** $60
- **OS compatibility:** Mac OS 9, Mac OS X
- **Company:** Intuit, 800/952-2558, www.quicken.com
or more lots of securities. If you are new to Quicken, two new assistants can walk you through the process of creating investment accounts and bank accounts, respectively.

Moneydance Stumbles
Moneydance is written in Java, which means it works in many operating systems—Mac OS 8, 9, and X; Linux; and most flavors of Windows. Some features, though, depend on the robustness of a platform’s Java implementation. The most important example is that you can’t use online banking on the Mac unless you’re running OS X.

If you’ve been thinking of switching to Moneydance from Quicken or another financial program, think again. You can’t import Quicken data into Moneydance, and although the hype on the program’s box boasts of its ability to import files in Quicken Interchange Format (QIF), doing so yields unintentionally hilarious results. After importing my Quicken data from a QIF file, Moneydance thought I owned stocks worth $4.8 billion; if that were true, I assure you that someone else would have written this review. Out of 28 accounts exported from Quicken 2002, only 3 imported with the correct transactions and balances, and the program created dozens of blank accounts. Moneydance also failed to identify investment accounts correctly; it placed the imported data into bank accounts, which prevented me from using the portfolio-tracking features (once an account is created, you can’t convert it from bank to investment).

Macworld’s Buying Advice
Moneydance 3.2 is less expensive than Quicken 2002 Deluxe, but the latter’s $20 rebate for owners of previous versions (including those that shipped with iMacs) means that for many users the two are effectively the same price. But even at the higher price, Quicken provides much more value than Moneydance. In virtually every financial area, Quicken’s tools are more complete and easier to use than their Moneydance equivalents. Moneydance is improving rapidly—two updates arrived before this review was completed—but it has a long way to go before it can challenge Quicken as the Mac’s personal-finance leader.

Rewind 1.2
Better but Not Perfect

Our first look at Power On Software’s Rewind—a utility designed to restore your Mac’s hard drive to a previous saved state—left us unimpressed by the program’s performance. Rewind 1.2 corrects most of version 1.1’s problems (Reviews, April 2001): it doesn’t constantly access the hard drive when updating its database, and it more quickly releases free hard-drive space.

However, some reliability problems remain. For example, after upgrading a PowerBook G4 from Mac OS 9.1 to Mac OS 9.2.1, I pressed the R key in an attempt to boot from Rewind’s Emergency Disk—a virtual startup drive set aside on the Mac’s hard drive—but I was unsuccessful. I worked around the problem by deleting the Emergency Disk and replacing it with a new one created in OS 9.2.1. Then, after I rewound back to OS 9.1, booted from the Emergency Disk, and attempted to rewind back to OS 9.2.1, the PowerBook refused to boot up.

Macworld’s Buying Advice
Although Rewind is getting better, there’s still room for improvement. It can get you out of some sticky situations—but you shouldn’t use it in lieu of a comprehensive backup strategy.—CHRISTOPHER BREEN
Mesa 3
Cocoa Spreadsheet Has a Few Smart Features—and Some Gaping Holes

P & L SOFTWARE'S MESA 3, a full-blown spreadsheet program written in Cocoa, lets you build a budget document, map out complex statistical data, and produce presentation-quality reports. But how does Mesa measure up to Microsoft Excel when it comes to slicing and dicing your numeric data? Not very well, unfortunately.

Mesa is packed with outstanding timesaving tools, including several that outshine Excel's. The Formula Inheritance feature lets you copy formulas from cell to cell, maintaining a link between the original formula and all the copies. If you make a change to the original formula, all the referenced cells update automatically, making it easier to execute global changes to calculations throughout your document. And Report Builder lets you create customized layouts for printed reports using a WYSIWYG view.

But Mesa's advanced features cannot make up for its deficiencies. There is no zoom tool, charting options are limited (you can't make pie charts, for example), and contextual pop-up menus are rare. And Mesa is often less intuitive than Excel.

Rating: 8 1/2
Pros: Formula-building shortcuts; tools for building custom reports.
Cons: Lacks basic functionality; non-standard keyboard shortcuts; limited charting options.
Company's estimated price: $99
OS compatibility: Mac OS X
Company: P & L Software, mesa@plsys.com, www.plsys.com

Macworld's Buying Advice
Mesa is a powerful spreadsheet program, and it runs natively in OS X, but the holes in its feature set and lack of polish make it pale in comparison to Excel.—JOSEPH SCHORR
HAVING YOUR SERVICE BUREAU run your job through a preflighting program can prevent errors from showing up in print, but each problem that crops up causes delays and may result in extra charges.

Markzware's FlightCheck Classic 4.2 can help you eliminate problems before you submit your job, saving you time and money. Its Ground Controls palette lets you set up the rules by which the program will flag conditions as errors. FlightCheck scans your publication and then produces a detailed usage report, a window showing the problems it's flagged, and a window that lets you step through and fix problems. When you're done, the program can collect all your job's elements and save them for transmission.

FlightCheck checks for everything from obvious oversights, such as missing fonts, to obscure problems, such as an out-of-range ink limit. And it supports all major page-layout and image-editing programs.

**Macworld's Buying Advice**
FlightCheck Classic catches more potential problems and is moreconfigurable than its main competitor, Extensis's Preflight Pro, and it's much more comprehensive than the preflighting utilities in the applications whose output it checks. If you need to deliver publications that will sail through your service bureau's production chain, this is an indispensable tool. —BRUCE FRASER
World Book Mac OS X Edition
Aquafied Encyclopedia Is an Able Research Assistant

The World Book Encyclopedia, 1960 edition, was the encyclopedia of my youth; its volumes filled half the available shelf space in the family room. Times have changed, and World Book is now available on space-saving CD-ROM (but not on DVD). The latest version, World Book Mac OS X Edition, fills two CDs with the complete text of the current print edition, as well as media content I never dreamed of as a kid. You can even update the program over the Web.

This edition incorporates Aqua elements seamlessly and takes advantage of OS X's multimedia capabilities, offering images, audio, video, animations, and 360-degree panoramas. World Book is available in a $49 edition for older versions of the OS.

Geared primarily toward middle-school students, the CDs include an atlas, a dictionary, and a basic word processor; homework wizards help kids create timelines, make charts, and write reports. Unfortunately, you can't drag and drop from the chart and timeline tools into the word processor. And although you can use the search tool or click on icons to see Web-based information, links are missing from the articles themselves.

Macworld's Buying Advice
World Book Mac OS X Edition is a solid research reference for young students and a worthy successor to the hardbound version.—Henry Bortman
Sorenson Video 3 Professional
QuickTime Codec Delivers Excellent Video Quality

QUICKTIME 5.0.2 INCLUDES a free copy of Sorenson Video 3—the latest version of the most widely used codec for compressing and decompressing Web-based QuickTime video—but multimedia professionals should consider paying $499 for the Professional Edition. Its advanced compression settings yield even better image quality, and it has a few features the free version lacks (for example, the ability to add color watermarks to a movie as you compress it).

Unfortunately, neither version takes advantage of multiple processors—a useful feature when you’re encoding live events. (A free update that adds support for multiple processors should be available by the time you read this.) One of the Professional Edition’s best capabilities—variable-bit-rate (VBR) encoding, which improves image quality—will be inaccessible until Discreet’s Cleaner 5.1 ships. And the program runs only in Mac OS 9—not in OS X’s Classic mode.

Macworld’s Buying Advice
Sorenson Video 3 Professional Edition is a superb, if pricey, codec for low-bit-rate applications. QuickTime pros who create high-quality Web video will want it, especially once Cleaner 5.1 is available.—JIM HEID

Rating: ★★★½
Pros: Dramatically improved image quality; advanced compression options.
Cons: No multiprocessor support; VBR encoding requires Cleaner 5.1.
Company’s estimated price: $499
OS compatibility: Mac OS 9, not Mac OS X’s Classic mode

FireFly™ Portable CD-R/W
Speedy (8x8x24), reliable CD burning

FireWire™ Thin Drives
Fast, portable hard drive in 10, 20 and 30 GB capacities

Get to your destinations faster and easier with SmartDisk products designed to meet the demands of your portable lifestyle.

Keep your engine running with power accessories for your PowerBook or iBook available at www.smartdisk.com.

www.macworld.com December 2001 49
NO PURCHASE NECESSARY TO ENTER OR WIN. IF YOU DO NOT WANT TO BE BOUND BY THESE RULES, PLEASE DO NOT ENTER THE DRAWING.

HOW TO ENTER: Drawing is open only to current Macworld subscribers to Macworld Online (Marcworld.com). To enter, complete the survey at www.macworld.com/survey and fill out the entry form at the end of the survey. The form must contain your name, mailing address, e-mail address, and daytime phone number. If your name and/or address differ from Macworld’s subscription records, a valid subscriber number must also be supplied. The information you provide in the survey is for research purposes and will be held strictly confidential. This information will never be sold or given away, how ever, it may be used to notify you as a result of this promotion. You may request information you provide us. Entry period begins at 12:01 a.m. (Pacific Time), on 12/21/01 and ends at 11:59 p.m. (Pacific Time) on 12/28/01. Participation constitutes entrant’s full and uncondition al acceptance of these Official Rules which shall be final in all respects. Only one entry is allowed per person. For the purposes of this promotion, an “entrant” shall be a person of family, or household with a valid e-mail address. Multiple entries by the same entrant will be disqualified. Late entries, illegible entries, and incomplete entries will not be accepted. All entries subject to verification.

ELIGIBILITY: Any questions may be answered by e-mail and/or telephone as on 12/21/01. For winner’s name, send a self-addressed, stamped envelope after 12/28/01 to Macworld Online Drawing, 301 Howard St., 15th Floor, San Francisco, CA 94105. No purchase necessary to enter or win. Drawing is open only to legal residents of the 50 United States or the District of Columbia who are 18 years of age or older upon entry. Persons in any of the following categories are NOT eligible to participate in this drawing: (i) employees of Mac Publishing, LLC and its subsidiaries, affiliates, agents, or their independent contractors; (ii) individuals engaged in the development, production, or distribution of materials for this drawing; (iii) persons who are immediate family members of any person in any of the preceding categories regardless of where they live; or (iv) persons who reside in the same household, whether related or not, as any person in any of the preceding categories.

WINNER SELECTION: On or about 12/28/01, one Grand Prize winner and one First Prize winner will be selected randomly among all eligible entries received. Sponsor reserves the right to disqualify any entrant who is not in compliance with any of the terms and conditions of these Official Rules. Any determination made by the Sponsor is final and binding upon all entrants, and no disput es will be entertained. The odds of winning depend on the number of eligible entries received. Winners will be notified by e-mail and/or telephone as on 12/21/01. For winner’s name, send a self-addressed, stamped envelope after 12/28/01 to Macworld Online Drawing, 301 Howard St., 15th Floor, San Francisco, CA 94105. A Prize Is non-transferable. No cash redemption or substitution will be allowed except at Sponsor’s sole discretion. The prize is subject to forfeiture and awarded to an alternate winner. Winners are responsible for all applicable federal, state, and local taxes. If these values are not provided by any promotional or other materials published in connection with the drawing, these rules shall control.

17-inch flat-panel displays

\[ \frac{1}{2} \] Acer FP751
\[ \frac{1}{2} \] AG Neo X174
\[ \frac{1}{2} \] Apple 17-inch Studio Display
\[ \frac{1}{2} \] Envision Peripherals EN-7100e
\[ \frac{1}{2} \] iyama Pro Lite 44A
\[ \frac{1}{2} \] NEC-Mitsubishi 1700M
Philips 170B
Planar 17.4-inch Multi-Media Monitor
Predictor PL765 LCD 17-inch
Samsung SyncMaster 170MP
Samsung SyncMaster 170T
ViewSonic VE170 ViewPanel
ViewSonic VG175 ViewPanel

Web-log analyzers

\[ \frac{1}{2} \] Analog 5.03
\[ \frac{1}{2} \] Sawmill 6.2.5
Summary 2.0.1

Math software

\[ \frac{1}{2} \] Mathematica Explorer
\[ \frac{1}{2} \] Mathsoft

USB flash storage

\[ \frac{1}{2} \] DiskOnKey
\[ \frac{1}{2} \] Trek ThumbDrive

Optical mouse

\[ \frac{1}{2} \] Kensington PocketMouse

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FLAWED:

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The Game Room

Third-person action games, such as those in the Tomb Raider series, are related to but subtly different from games in the first-person-shooter genre. They not only present action from diverse perspectives—vantage points outside your on-screen persona—but also call on different skills. These games often require a better sense of spatial awareness and feature more puzzles, platforms, and mazes.

This month I'm taking a look at two third-person action games that have recently been released for the Mac—Star Trek Deep Space Nine: The Fallen and American McGee's Alice.

Go Ask Alice
American McGee's Alice is an unusual and disturbing journey through Wonderland. Game publisher Aspyr Media and conversion studio Westlake Interactive collaborated to bring it to the Mac. It's built on top of the same engine that powers Id Software's Quake III Arena, so it has similarly rich graphics and animation.

Alice has many of the trappings you'd expect from a third-person action game. Mostly, what you must do is get from point A to point B without plummeting to your death or being feasted upon by voracious monsters. On your way to each goal, you have to figure out how to make your way across precarious ledges, through rushing water, and around other pitfalls. Some elements involve careful timing. Others involve recovering an item that another character needs in order to help you. Sometimes you have to solve basic puzzles. Truth be told, none of Alice's elements are particularly new or innovative, but they're done extraordinarily well.

In this game, Alice is older than she was in Lewis Carroll's book. A fire has claimed her family, sending poor Alice to a sanitarium. There, she takes an inward journey back to Wonderland, only to find that it's a dark shadow of the place she remembers from her childhood. Alice must find her way home from this dark, eerie place, confronting the wicked Queen of Hearts along the way.

Many elements of Alice's Adventures in Wonderland are here. Alice can summon the Cheshire Cat to get advice, for example, and he's as enigmatic as ever, though his rictal grin and wrung neck make him look more like a reanimated cadaver than the lovable pink-and-purple creature popularized by Disney half a century ago. The Caterpillar is back again, as is the White Rabbit and other characters from the original story, but they're more sinister.

Although it's downright creepy, the game—from the levels to the textures to the characters—is exquisitely designed, with fine detail and stunning architectural elements. Bold use of texture and color make this game a feast for the eyes. It's one of the best-looking games to be released for the Mac this year.

The voice acting is well done—characters are believable, and the accents and affectations are never cloying or hokey. The music helps set the mood, although it does occasionally wear out its welcome. The sometimes haunting soundtrack was composed by Chris Vrenna, whose previous credits include a stint with Nine Inch Nails.

Today Is a Good Day to Die
By far, my favorite Star Trek show has been Deep Space Nine. So I had high expectations of Simon & Schuster...
Interactive's release of Star Trek Deep Space Nine: The Fallen, a game that finally came to the Mac after a delay of almost a year. Was it worth the wait? In some respects, yes; in others, no.

The Fallen fits into the framework of Simon & Schuster's Star Trek Deep Space Nine series of novels. If you're a fan of the books, you'll be pleased to find a game that maintains their storyline. Developed by Collective Studios, Star Trek Deep Space Nine: The Fallen alternately puts you in the roles of characters Sisko, Kira, and Worf. You must recover the Red Orb, an ancient artifact containing the essence of the Pah Wraiths, a race of alien creatures that once threatened to destroy the people of planet Bajor. Two opposing forces have discovered that recovering the Orb can lead either to peace or to the development of a superweapon.

The game is powered by the Unreal Tournament engine, and it looks and plays great—most of the time. Collective Studios has added some advanced features to the engine that help provide fluid character animation and realistic special effects. All the requisite elements of the third-person action game are here. You’ll spend much of your time exploring different areas, recovering items you need to continue the game, and achieving goals such as collecting keycards. A lot of this gameplay is similar to other third-person action games, but it does drive the story forward.

The game's interface is very Trek-like, and certain elements take The Fallen beyond a basic action game. You wield a tricorder to find items and life forms, and you match your phaser to the frequency of alien shields. You can call upon Bashir, Dax, Odo, and others to help you.

One of The Fallen's most unusual aspects is that it's a story told in three parts. You’re required to play each of the three characters in the story, although the order in which you play them is largely up to you. This sounds better in theory than it is in practice, because it can lead to inconsistent storytelling. It’s worth playing the game out as all three characters, though I had to stop between characters and play something else to avoid burnout.

Call me uncoordinated, but I repeatedly found myself getting cut to ribbons by various menaces as I fumbled with the sometimes complex combination of keyboard and mouse movements needed to execute commands or use some items. The game's difficulty level seems to be tweaked well above what's customary for games of this ilk.

The Fallen has a well-crafted story filled with interstitial sequences that make the game move forward like an episode of the television show—it’s engrossing and a lot of fun. And you get a chance to explore the Defiant, visit Bajor, check out different parts of the Deep Space Nine station, and travel to a Dominion prison base.

The game's soundtrack production and voice acting are top-notch, too. In fact, the game's producers lined up most of the actors from the television series, although sound-alike actors supplied the voices of O'Brien and Sisko. Those replacement actors did admirable jobs, but I must admit that I missed hearing Avery Brooks's distinctive and commanding voice in the role of Sisko.

Alas, The Fallen had problems on my G4/500 equipped with Mac OS 9.1 and 512MB of RAM. Audio would occasionally click or pop, and I had to restart my Mac at times when the game froze. I also had a few problems getting the game to start at all.

Macworld's Buying Advice
Both of this month's selections offer new looks at familiar stories. American McGee's Alice is definitely not for those seeking Disney's sweet version of Lewis Carroll's heroine, but it's a mind-bending treat for anyone who wants hard-core gaming. Star Trek Deep Space Nine: The Fallen is beautiful look at, but it's hampered by audio glitches and can be unreliable.

MacCentral Senior Editor PETER COHEN is reserving judgement on the new series Enterprise—at least for a season or two.


---

**AMERICAN McGEE'S ALICE**

**Rating:** ★★★★

**Pros:** Beautifully rendered scenes and character animations; an intriguing take on Alice's Adventures in Wonderland; Carbonized for Mac OS X.

**Cons:** Some levels take a long time to load.

**Company's estimated price:** $50

**OS compatibility:** Mac OS 9, Mac OS X

**Company:** Aspyr Media, 888/212-7797, www.aspyr.com

**STAR TREK DEEP SPACE NINE: THE FALLEN**

**Rating:** ★★★½

**Pros:** Essentially three games in one; true to the Star Trek world.

**Cons:** Lacks reliability and stability; no Mac OS X compatibility.

**Company's estimated price:** $30

**OS compatibility:** Mac OS 9

**Company:** Simon & Schuster Interactive, 888/793-9972, www.ssimaginteractive.com
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The Mac community has been buzzing about Mac OS X for years. But even Apple admits that OS X's previous incarnations—from last year's beta to this spring's first "final" release—were only for people who wanted to experiment with and explore the operating system's new features. For these early adopters, OS X was a glimpse into the future—the rest of us just sat back and waited for the future to arrive.

Apple's new version of the OS, Mac OS X 10.1, is what we've been waiting for. With improved reliability, dramatic speed boosts, many interface improvements, and a clutch of native software, this release is the first version of OS X that's truly ready for general use.

Although Mac OS X is still not a feature-for-feature match for Mac OS 9, it's no longer a step backward (see "Are You Ready for OS X?" June 2001). This version combines much of OS 9's functionality with a collection of improvements that make upgrading to OS X a serious possibility for even dyed-in-the-wool devotees of the classic Mac OS.

**SPEED BOOST**

Most Mac OS users asked Apple to improve OS X's performance before adding whizzy new interface additions or networking utilities—the fact is, the first version of OS X was slow.

**Fast and Furious** Apple says version 10.1 is "all about performance," and our tests bear that claim out. The Finder is now quick to respond to clicks, double-clicks, and drags—in many cases, OS X's responses are now faster than OS 9's. Menus drop from the menu bar much faster than they did in version 10.0, and a moderate-size folder can now be copied in the blink of an eye.

Application launches are also much faster in this version. When a couple of programs are running, a new program launches in a single "bounce" of its icon in the Dock. The more programs you have running, the longer launching a new one takes, but starting apps is no longer the trial it was in the initial release of OS X.
Lab Testing  Macworld Lab compared Mac OS X 10.1 with Mac OS X 10.0.4 and OS 9.2.1, and found that the new version of OS X was clearly faster than its predecessor (see “A New 10”). OS X 10.1 also tended to be as fast as or faster than OS 9 on G4 systems, but it was slower on G3 Macs.

Generally, drawing on-screen graphics has gotten a big boost in version 10.1, especially in the 3-D realm. According to Apple, the speed of graphics drawn via OpenGL has increased by 20 percent in this release. In addition, OS X 10.1 offers native support of the GeForce3 acceleration card. In our graphics-intensive Quake III tests, version 10.1 was clearly faster than version 10.0.4, but it was slower than OS 9 on all systems except the dual-processor 800MHz Power Mac G4. Oddly, OS X 10.1 actually performed worse than version 10.0.4 on our PDF scrolling test—and both lagged very far behind OS 9.

According to Apple, every dimension of the operating system has been modified to improve performance—the virtual memory system, the file system, the graphics subsystems—and there have been innumerable small speed improvements as well. Our tests verify Apple’s claims. The most impressive improvement was in iMovie rendering, which was almost twice as fast in version 10.1 as in version 10.0.4.

And the speed boosts aren’t limited to OS X-native applications. Our tests show that applications tend to run almost twice as fast in OS X 10.1’s Classic environment as they do in OS 9. Most actions in our Photoshop 6.0 tests took only a few seconds longer in OS X 10.1 than in OS 9—but they were faster under OS X 10.1 than under OS X 10.0.4.

The result of Apple’s tweaks to OS X is an operating system that feels eminently usable, a big change from the hair-pulling experience that was version 10.0.

INTERFACE MODIFICATIONS
Giving Mac OS X a speed boost may have been Apple’s primary focus, but Mac OS X 10.1 also features a host of interface changes. Some new additions boost productivity, while others are tweaks to poorly thought-out features from OS X’s first release (see “Mac OS X Face-lift”).

Dock Tweaks  The biggest change to the Mac interface in OS X was the addition of the Dock, a strip of icons showing running applications and minimized windows while also functioning as a launcher for commonly used items. You can now move the Dock from its standard position at the bottom of the screen to either the left or the right, and other changes have been made.

Apple now offers two options for minimizing and maximizing windows when you move windows into or out of the Dock. In addition to the much-ballyhooed “genie” effect, there’s a subtler and much faster scaling effect, which shrinks a window (without any processor-intensive warping effect) that’s on its way to the Dock.

Take Out the Trash  Another tweak to the Dock alters an interface quirk that’s been with the Mac since it was introduced: namely, the mixed metaphor that is the Trash. Logically, when you put a document into something called the Trash, you expect it to be thrown away. But does it make sense, especially for novice users, that you drag a disk to the Trash to eject it?

In OS X 10.1, the icon transforms itself based on context: the familiar garbage-can icon remains when you drag a document to the Trash; an eject-button icon appears when you drag a removable disk to the Trash; and a “burn” icon shows up when you drag to the Trash a CD-R that’s destined to be burned with OS X’s new data CD-burning features.

Quick Access  In OS X’s original release, controls for many common system preferences were hidden deep in the System Preferences application. In version 10.1, Apple has brought them to the forefront by adding a series of icon menus to the right-hand corner of the Mac OS menu bar.

RENDERING IN IMovie
WAS NEARLY TWICE AS FAST IN VERSION 10.1 AS IN VERSION 10.0.4.
This new method lets you view a portable Mac's battery status, set your system volume, monitor AirPort signal strength, choose AirPort servers, and modify display and networking settings—and it's as easy as using Mac OS 9's Control Strip.

Even the clock in the top right corner is now a drop-down menu—if you click on it, you can see the weekday, date, and time, and have quick access to clock settings and the Date & Time preference panel. You can rearrange menu-bar items by Date & Time preference panel. You can also remove an item by clicking and dragging them into position. You can also remove an item by clicking and dragging it off the menu bar; then you simply watch it disappear in a puff of smoke—much easier than turning it off via its preference panel.

Docking Control Although Apple prefers that third-party software developers not add items to the menu bar, some have done so—Aladdin, for example, with StuffIt Deluxe 2.6.5. These, however, cannot be moved or removed. Alternatively, developers can create items whose icons sit in the Dock and provide a set of commands when control-clicked on. For example, a future, OS X-savvy version of Palm Desktop might have an icon in the Dock that revealed the current day's appointments and to-dos, as well as shortcuts to launching the full Palm Desktop application or making a quick appointment.

Apple itself is taking advantage of this technology. iTunes—now part of OS X—offers a contextual menu, which indicates the title and artist of the currently playing track and gives you pause and track controls, in the Dock.

Preference Order In the first release of Mac OS X, Apple replaced control panels with the System Preferences application, a multipaned window with 21 preference items to click on. For users still trying to adapt to life without control panels, the sea of icons in System Preferences was especially confusing.

With 10.1, Apple has tried to clean up the System Preferences application, dividing preference icons into four categories: Personal, Hardware, Internet & Network, and System.

A few preferences behind those icons have changed, too. For example, the Desktop preference panel's Desktop Pictures option now lets you view a folder's picture files as thumbnails, making it easier to select a picture to place on your desktop. If you want to enable or disable any of OS X 10.1's new menu-bar icons, you do that via the relevant preference-panel settings, such as the new Show Displays In Menu Bar option in the Displays preference panel.

Improved Access There's one new preference panel in Mac OS X 10.1: Universal Access. Like the Easy Access tool found in the classic Mac OS, Universal Access serves people who have difficulty using mice or keyboards. From the Keyboard tab, you can activate an option that continues

A New 10

We tested three Macs—an iMac G3/500, a Power Mac G4/867, and a dual-processor Power Mac G4/800—to see how Mac OS X 10.1's performance compared with Mac OS X 10.0.4's. To see how OS X's scores stacked up against those of the classic Mac OS, we also ran our tests in OS 9.2.1 on all three systems. Version 10.1's most dramatic speed gains were in Movie rendering, opening multiple folders, our Quake frame-rate test, and our Cinema 4D XL Multitask test.

Best results in bold. Shorter is better. Longer is better.

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<tr>
<th>System</th>
<th>STARTUP</th>
<th>OPEN MULTIPLE FOLDERS</th>
<th>IMOVIE 2.0 RENDER</th>
<th>PDF SCROLL</th>
<th>ITUNES 1.1 MP3 ENCODE</th>
<th>CINEMA 4D XL 7.1</th>
<th>CLASSIC STARTUP</th>
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*Photoshop testing under Mac OS X was done in Classic mode. **NA=not applicable.

Cinema 4D scores are in minutes:seconds. Quake III scores are in frames per second. All other scores are in seconds. We tested all systems with 256MB of RAM, with Mac OS X 10.1, Mac OS X 10.0.4, and Mac OS X 10.0 installed on separate partitions. We set displays to 1024x768-pixel resolution and 24-bit color. For Photoshop tasks, we used a 50MB file. Cinema 4D XL rendered a model at a resolution of 640 by 480 pixels with oversampling set to 2 by 2. We rendered the same model in Cinema 4D XL while playing a QuickTime movie in the background for the Multitask test. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long and converted it using iTunes' Better Quality setting of 160 Kbps. We ran Quake III v1.29R's Time Demo at 640-by-480-pixel resolution, with graphics set to Normal. We used Adobe Acrobat 5 for the PDF scroll test. Classic mode used the base extensions for Mac OS 9.2.1—Macworld Lab testing by Ulysses Bravo

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MAC OS X FACE-LIFT

Mac OS X's brand-new Aqua interface was a giant leap for Apple, but not everyone felt the same way about that leap's direction. Some parts of the interface were buried away in unfamiliar places, some were not completely finished, and others were missing altogether. With version 10.1, Apple has done more to make the interface friendly and usable; those who still hanker for the days of Mac OS 9 should be pleased.

Print dialog box. and turning on Full Keyboard Access allows you to enter a sequence of modifier keys as a key combination. For example, if you can press only one key at a time, you can press the command and P keys in succession, instead of simultaneously, to get the Print dialog box.

Line Up The improved Systems Preferences pane gives you easier and more logical access to the preferences that control every aspect of your interaction with the OS. Preferences are grouped into four shell-like categories rather than shown all together, and common preferences are duplicated at the top.

Drop and Give Me Options With the new Apple menu-bar icons, you can see the date and time, control your AirPort connections and view signal strength, change your monitor resolution, adjust your system volume, and more.

Movie Magic Apple's DVD Player 3.0 lets you watch movies in OS X. Its controller is like a set-top DVD player's, and it has full-screen and launch-on-insertion options.

Pop Goes the Dock In OS X 10.1, Apple added more flexibility in the Dock. You can move the Dock to the left or right side of the screen—a common user request—and you can now control actions via Dock-based contextual menus that open with a control-click. In iTunes, for example, you can see what track is playing, pause it, or go to another track in your playlist. Third parties can build this functionality into their Dock icons.

From the Mouse tab, you can enable a feature that lets you use the numbers on your keypad to control the cursor. Or you can eliminate the need for a mouse altogether by opening the Keyboard preferences panel and turning on Full Keyboard Access (control-F1). This feature lets you control the menu bar, the Dock, windows, tool bars, and palettes entirely through the keyboard.

Logging In Unlike Mac OS 9, which offers the Multiple Users feature as an option for shared Macs, Mac OS X requires everybody to log in as a user. (Apple has just managed to hide this fact by having the system create a user when you install OS X and then log you in when you boot up. You can change that setting via the Login preference panel.)

While single-user Macs never have to see any Login options, users of shared Macs aren't so lucky. In OS X 10.0, users had to enter a user name and password to log in to the system. With this version, however, Apple has made OS X's Login panel just as flexible as OS 9's—by default, the Login window now displays a list of available users for you to choose from. You can even set up icons for individual users, à la Multiple Users—just visit the Identity pane of the Users preference panel.

On-Screen Controls In the original version of Mac OS X, some hardware controls—namely, the brightness and volume controls on Mac laptops' function keys—didn't work correctly, and when they did work, you got no feedback that they were working. Now the brightness and volume controls work just as they did in OS 9, though they provide feedback as only Aqua could—when you adjust brightness or volume, a semitransparent icon appears, gives you feedback about your settings, and then gently fades away.

Other Choices Version 10.1 also gives back a few interface choices once offered only to users of the classic Mac OS. Through the General preferences panel, you can choose whether your windows' scroll bars have single- or double-headed arrows at the top and bottom. From the same panel, you can define how many documents and applications appear in the Recent Items submenu of the Apple menu (a feature from OS 9's Apple Menu Options control panel), and choose the...
point size at which the system should begin automatically antialiasing text.

**OS X GETS CONNECTED**

With Mac OS X, Apple has attempted to make an operating system that's a good cross-platform partner for Windows PCs, in areas from file names to networking.

**File Names** First off, Apple has radically changed the way the Mac handles file names. Now Mac OS is much more savvy about dealing with Windows-style file-name extensions (.doc, for example)—it can even hide those extensions from you in the Finder (see “True Names and Other Dangers”).

In addition to those changes, Mac OS can now handle long file names like those found on Windows files since the advent of Windows 95. In OS X 10.0, files could have names as long as 255 characters, but the Finder couldn’t display them. In version 10.1, the Finder can display file names on two lines when in Icon mode, making it much easier to recognize files with extremely long names.

**Network Friendly** Mac OS X 10.1 not only handles PC files in a friendlier manner but also has a much nicer demeanor when dealing with Windows file servers. Included as part of OS X 10.1 is a Server Message Block (SMB) client, meaning that Macs can now connect to PC servers without the assistance of an add-on such as Thursby Software’s Dave.

**A Little DAV’l Do Ya** WebDAV is an increasingly popular file-sharing method, especially among Web designers. WebDAV uses Web-server technology to create file-sharing connections continues

**TRUE NAMES AND OTHER DANGERS**

Perhaps the most noticeable change to the traditional Mac way of doing things is how the new OS handles file names. With OS X 10.1, Apple has begun to encourage file compatibility between Macs and Windows PCs by adopting (if not quite embracing) the three-letter file-name extensions that have been attached to PC files since the dawn of DOS.

**Brave New World** Mac OS X 10.1 tries to shield users from the ugly file-name extensions of the Windows world, while at the same time encouraging Mac users to create files in the same way that Windows users do.

Confusing? It sure is—and it could potentially pose interface dilemmas that Mac users have never seen before.

By default, Mac OS X 10.1’s Finder hides file extensions from users. Although you might look in a folder and see a Microsoft Word document called “Letter,” the file name may actually be “Letter.doc.” Apple has made it possible for developers to append hidden extensions to file names, so if you choose to save a document as “report,” it may say “report” in the Finder, but the real name on the hard drive is “report.rt.”

Version 10.1 also introduces a strange quirk to the Finder: if you’ve got more than one file with the same name, and each has a different extension, you may end up with a folder full of files that appear to have the same name (see “Will the Real File Please Stand Up?”).

Apple’s rationale is that Mac users have no interest in seeing three-letter file extensions—and Microsoft obviously feels the same way about Windows users, as it has hidden those extensions from its users since the days of Windows 95—but they’re still necessary for complete compatibility with Windows PCs, which, unlike Macs, rely on those extensions to determine a file’s type and figure out which application should be used to open a file.

Many Mac users will undoubtedly find it unsettling that, for the first time, what you see in the Finder may not be what’s actually on your hard drive. Fortunately, Apple has provided an Always Show File Extensions option in Finder Preferences; it can make sure that what you see is what you get. You can also show or hide extensions on individual files by choosing Show Info (⌘-I) from the File menu and selecting Hide Extension from the Name & Extension panel.

**What Type Am I?** Mac OS X is now much more savvy about using file-name extensions than the classic Mac OS ever was. OS X’s Finder can determine a file’s type based on its name, and treat it just as it would a native Mac document. For example, if you receive an Excel file called “spreadsheet.xls” from a PC user, it will show up in the Finder as an Excel file, icon and all.

For file extensions that could potentially be owned by more than one application—text files, for example—OS X users can use the Finder to choose a program to take precedence. Choose Show Info for a document of that type, select Open With Application, and then pick the application that should own it. Pressing the Change All button will make sure that every file with that extension (whether or not it has Mac type and creator information) will be opened by the application you chose.

**Will the Real File Please Stand Up?** In OS X, hidden file-name extensions mean that you can have multiple files with seemingly identical names.
take advantage of the Simple Object Access Protocol (SOAP) to access data stored on remote XML-based database servers. You can even drag AppleScripts to the Finder’s tool bars to add custom features to the Finder.

A BETTER DIGITAL HUB

Earlier this year, Steve Jobs first described his vision of the Mac as a “digital hub,” the nerve center of a collection of digital devices, from cameras to handheld computers to consumer audio and video devices. Not surprisingly, Mac OS X 10.1 offers several new and improved features that tie in with the Apple CEO’s strategy.

**DVD Arrives**  One of the glaring omissions in the first release of Mac OS X was support for DVD-movie playback. But this new version of OS X includes DVD Player 3.0, an application that makes the DVD-viewing experience as good as, if not better than, the one in OS 9.

### The Face of Things to Come

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* Acrobat Reader is part of the OS X 10.1 installation.
** Betas are currently available.
*** The latest version will work with OS X II run from a bootable disk or an OS 9 partition on the hard drive.
A new generation of First Person Shooters that will revolutionize Mac gaming.

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The new DVD Player app has an improved remote-control palette and lets you decide how you want the player to behave when you insert a disc (you can set it to jump into full-screen mode or to begin playing upon insertion of a disc). DVD Player won't work, though, on PCI-based blue-and-white G3s and the first G4s.

Playing DVDs really shows off the power and multithreaded nature of Mac OS X. When we played a movie on a dual-processor 800MHz Power Mac G4, we could freely drag the movie window around the screen without any apparent dropping of frames. On a 500MHz iBook, that didn't work, but we were able to use other applications while the movie played in a background window, without any hiccup or hesitation in either DVD Player or the other applications we were using.

**Video Burning** Mac OS X 10.1 doesn't include software for encoding and burning DVD-Video discs, but Apple's new iDVD 2.0—which should be available by the time you read this—requires version 10.1 to run—the biggest example being Microsoft Office X (see "Remodeling Office," elsewhere in this issue).

There are a few holdouts worth noting, including Adobe Photoshop and Apple's own Final Cut Pro; undoubtedly, certain segments of the Mac community will be forced to remain on OS 9 for a while. But most software is now making the move to OS X. And to top it off, version 10.1 includes two major applications itself, namely the final version of Microsoft Internet Explorer 5.1 and Adobe Acrobat Reader 5.0.

Apple's new operating system has left the world of theory and guesswork behind—its numerous performance and usability improvements make it a mature and reliable platform. We've been waiting for years, but Mac OS X is now truly the operating system of tomorrow. m

**TODAY, APPELETALK NETWORKING IS AS COMPATIBLE IN MAC OS X AS IT IS IN MAC OS 9.**

and the data in the temporary directory burns to the disc. Voilà—you've burned a disc from the Finder.

**Camera Friendly** Getting images from your digital camera is another important part of the digital-hub idea, and Mac OS X's support for digital cameras is better than ever.

In this version, OS X's Image Capture application also supports the Picture Transfer Protocol, an emerging standard for communicating between camera and computer. Plug in a camera, and pictures will automatically be transferred to your Pictures folder, or anywhere else you select. If you'd prefer to use some other utility to transfer your files, you can still shut off the automatic transfer.
One Evolution Deserves Another

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MacLinkPlus Deluxe 13 is the DataViz solution for OS X compatibility. With over 10 million copies sold, it continues to be the #1 selling file translation utility. MacLinkPlus Deluxe opens files that come as e-mail attachments, on disks, or files created in programs you just don't have. Whether you have an AppleWorks 6 file or an Excel 2002 file, MacLinkPlus Deluxe will be able to open it in the application of your choice. You don't have to worry about file types, document formats or Binhex encoding. What could be easier?

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EXCEPT FOR A FEW RISK-TAKERS OUT THERE, most of us don’t welcome major change. We need convincing evidence that leaving our comfortable ruts will benefit us. This is especially true when a change involves something we use every day, something our livelihoods depend on—for example, our operating systems and software programs.

With the release of Office v.X, Microsoft may have given Mac users a reason to leave the rut of Mac OS 9. Thousands of us rely on Word, Excel, Entourage, and PowerPoint, and those applications now run natively under Mac OS X. In fact, the new versions of these programs don’t run any other way, unlike some programs that work with both OS 9 and OS X. In a very real sense, the arrival of Office v.X legitimizes OS X.

Two Beta Xs In preparing this first look, we used a beta copy of Office v.X running under a prerelease version of Mac OS X 10.1. Since both products were weeks from completion, there was no way to make a solid performance judgment. With that caveat, we can report that the responsive feel of the Office applications was impressive; the programs launched quickly, and most operations were on a par with the same actions in Office 2001 under Mac OS 9.1.
Different but Familiar
With every upgrade, the first question most people ask is "What's new?" For Office v.X, there are two seemingly contradictory answers: "Everything" and "Not that much." Yet both answers are correct.

Mountains of Code For applications to run natively under Mac OS X, developers must rewrite large portions of them, especially if they're going to take full advantage of the Aqua interface. It can take months to port one application using Apple's Carbon application programming interfaces (APLs); all the underlying code that makes the program work needs revising, and every dialog box, tool bar, and window needs tweaking to look right in Aqua.

Microsoft developers had to port 2.5 million lines of Office code to OS X. Microsoft Office v.X consists of the four main applications; six ancillary programs (Clip Gallery, Database Daemon, Equations Editor, Graph, Office Notifications, and Organization Chart); and dozens of other files, such as shared libraries. Rewriting all that code required a mammoth programming effort that's lasted more than a year (see "The People behind the Program"). Much of that work went into Carbonization rather than into new features. So although just about all of Office has changed under the hood, what you'll most notice is the new Aqua paint job.

That's not to say that Office does not have any new features. Entourage X leads the pack with a significant face-lift, and Word X has a few nice additions. Microsoft gave Excel X and PowerPoint X comparatively short shrift in this revision.

Allover Aquafication Each program has been revised to follow the Aqua user-interface guidelines, adding a beautiful new look that may cause some confusion and require some adjustment. Word's Replace command, for example, has always been %H, but Aqua reserves that keystroke for hiding the current application. So Word X now uses %shift-H for Replace.

A Change to Sheets Office now uses Aqua's sheets for saving files; sheets are special dialog boxes that slide down from the title bar of a document window. With sheets, you never lose track of which window a dialog box applies to. And because sheets are attached to the document rather than the application, you're freed from an annoying Mac OS 9 trait: being stuck in an application by a dialog box that must be dismissed before you can continue. If you're in PowerPoint when your Entourage Calendar demands your attention, for example, you can take care of it right away.

Quartz Transparency Taking advantage of yet more new Mac OS X technology, Office v.X now uses the Quartz graphics layer for its drawing tools, allowing for anti-aliased and transparent graphic objects. Transparency might not sound like much of an improvement, but it can make a big difference in your documents. For instance, transparent elements in PowerPoint, Word, and Excel charts can help you present your data more clearly.

Although Office 2001 had a Semi-transparent option for graphics, it provided much less control than version v.X, which allows you to set an exact transparency percentage (see "You Can See Clearly Now"). And thanks to Quartz's superior rendering, you get smooth color gradients and higher-quality transparency.

Even though Quartz-driven transparency is a Mac OS X-only feature for Office, documents with transparent objects are still readable in older Mac and Windows versions of Office. These applications display the transparent parts of the graphics as dithered patterns, and you can't edit the transparency level.

Easy on the Eyes A large part of updating Office's interface was creating 700 new icons and changing 800 dialog boxes. Tool bars and their icons are bigger, more colorful, and more detailed, making them easier to understand—and nicer to look at.

Scroll and Click Thanks to the built-in support in Mac OS X 10.1, Office v.X applications are able to use some features in third-party mice and keyboards. Mice with scroll wheels and two buttons work; clicking the right button is the same as control-clicking, giving you easy access to contextual menus.

Entourage X From an interface standpoint, Entourage 2001, Office 2001's big addition, wasn't much more than a buffed-up Outlook Express 5. Personal informa-
tion manager (PIM) features—the enhanced address book, calendar, tasks, and notes—were clearly shoe-horned into Outlook Express’s interface. But Entourage X’s interface has had an extensive overhaul.

Easier to Switch Besides the Aqua look, you’ll find big buttons that switch between Address Book, Calendar, Mail, Notes, and Tasks, plus the vastly improved Custom Views. For the keyboard-oriented, each task area has a keyboard shortcut for quick switching.

At-a-Glance Improvements In the Calendar, events spanning multiple days now show as banners rather than as a string of repeated events (see “Calendar Evolution”). Color-coded days indicate workdays and weekends, and you can display a task list next to the calendar. New buttons in the tool bar toggle between Day, Week, and Month views.

Address Additions When you address a new e-mail message, a list of recently used addresses pops up, as do the usual address-lookup choices that appear as you type. The recently used addresses appear regardless of whether they’re in your Address Book, and names are prioritized, with the ones used most often at the top of the list. If you accumulate too many names, you can clear the list or even turn it off altogether.

E-mail Movies You can now copy formatted text, pictures, and even QuickTime movies from other applications and paste them into an e-mail message without losing the formatting. As one example, a realtor could drag a Word brochure for a property, including JPEG-formatted photos, into the body of an e-mail message for a prospective buyer, rather than enclosing the brochure as an attachment. Because many people—especially America Online and Windows users—have difficulty dealing with attachments, this addition could smooth the communication process.

Passwords New support for the Mac OS X Keychain means that you can let the system manage the passwords for all your mail accounts, without having to store them in Entourage (thus leaving your e-mail vulnerable to whoever wanders by your desk).

Custom Views If you are organizing your life in Entourage, you need tools that help you quickly sift through its wealth of information. All the task areas now have dedicated Custom Views that let you show selected data—for example, Mail Received Today or Events Due In The Next Week. You can create and save your own Custom Views, slicing and dicing data in any number of ways. For example, if you assign a common category to all of the items associated with a particular project, a Custom View can show you everything about that project, including appointments, e-mail, contacts, notes, tasks, and all the files you’ve created to support the project.

New Way to Notify Because Mac OS X does not allow extensions, the new Office Notifications application takes over the job of popping up and alerting users when Entourage reminders come due (see “Tell Me about It”). Mike Connolly, Microsoft’s group program manager, notes that Entourage X’s database is always running in the background, even when no Office applications are running. “And unlike Office 2001,” Connolly says, “there’s no performance hit on the active application, even when the database is doing an intensive operation, such as searching through mail messages.”

Besides Entourage events, Office Notifications alerts you when a buddy is available for instant messaging (if you’re online and have the new MSN Messenger 2.1 for Mac OS X installed). MSN Messenger works with Office Notifications to display .Net Alerts, a new service that lets live information from the MSN Web site, such as stock-price changes, pop up on your desktop.

Room for Improvement The PIM features in Entourage X still need
improvements before they’ll be able to go head-to-head with Power On Software’s Now Up-to-Date and Contact. Entourage is still a single-user app, so you can’t share your Calendar with coworkers. You can assign priorities to tasks but not to events. And when you complete tasks, they disappear from the Tasks pane next to the Calendar, rather than being shown crossed out. Most annoyingly, because Palm hasn’t completed native Mac OS X conduits, you can’t synchronize Entourage to your Palm handheld. Microsoft promises to make a free downloadable update available when Palm gets up-to-speed.

Word X
The most useful new feature in Word is noncontiguous text selection, which allows you to select one or more separate blocks of text in one operation: Select the first block of text, hold down the \( \text{Ctrl} \) key, and then select the next block (see “Choice Words”). Word applies your next operation to all of the selected text. Say you’re formatting a report with headings at the start of each section. You can scroll through the document, selecting each heading as you go, and then apply a style with one click.

Noncontiguous text selection also allows you to choose parts of your document for tasks. For example, you can check the spelling of the body of a report without slogging laboriously through that table of names and addresses in the middle.

Clear the Decks
One long-overdue new feature is the ability to clear all formatting of a selection and reset it to the default style for that paragraph.

Excel X
Although there are not a lot of new features in Excel, the program feels surprisingly fresh, again thanks to Quartz and Aqua. Text and numbers in cells seem easier to read and crisper, and improved shading in the row and column bars makes it more obvious which cell is selected. When you edit a cell, it appears to lift a bit above the rest of the worksheet, with a drop shadow that makes the cell you are working on very easy to pick out on screen (see “Excel Gets Obvious”).

Custom Shortcuts
For hardcore users, the most useful addition to Excel X will be customizable keyboard shortcuts. As in Word, you can add, reassign, or remove keyboard shortcuts. If you’ve been using Excel for several versions, this will be especially welcome, since Office 2001 remapped many long-standing shortcuts, such as \( \text{Ctrl} - \text{B} \) for blanking out a cell’s contents. The ability to customize the keyboard in Excel allows longtime users to restore those familiar shortcuts.

Transparent Charts
When you generate charts in Excel, you can now set the transparency of individual bars, columns, or other chart components. For example, in 3-D charts, you can make the frontmost elements translucent, so you can still see information in the rest of the chart. And because of Quartz antialiasing, jagged chart lines are a thing of the past.

Data Recovery
Excel’s new Auto-Recover feature automatically saves a snapshot of your worksheets at timed intervals you set. If Excel crashes when you haven’t saved for a while, AutoRecover brings back all or part of your unsaved work when you reopen your document. You should then save it right away, and fast!

PowerPoint X
Like the rest of Office, PowerPoint lets you set the transparency of drawn objects or pictures, and it uses Quartz’s text manipulation and layout abilities to antialias text on your slides, making for clearer and more-attractive presentations.

The Whole Package
New to PowerPoint are PowerPoint Packages. A Package gathers your presentation and any linked files into one folder, which you can then burn to a CD or e-mail to a colleague.
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THAT'S A DIGITAL CAMERA.
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Supercharge Your Office

MICROSOFT OFFICE IS PACKED with tools designed to help save you time and effort—from automatic text insertion to a dizzying array of preferences. But if you want to put Office into high gear, you can create macros—small programs that automate repetitive tasks. Windows users have long enjoyed the robust programming tools of Visual Basic for Windows, but Mac users who wanted to take advantage of this power had to rely on the limited capabilities of Office’s scaled-down Visual Basic Editor—until now. Thanks to the release of Real Software’s $350 RealBasic 3.5 (512/263-1233, www.realsoftware.com), Mac users now have a full-featured tool for editing Office’s Visual Basic code—and putting Office into overdrive.

The Basics of RealBasic

RealBasic is a Mac OS programming environment that works a lot like Visual Basic for Windows. It allows users to create customized applications that run natively and can control almost any aspect of a computer. But unlike Visual Basic for Windows, RealBasic lets you create applications for both Mac and Windows operating systems—which means that you can share them with your cross-platform coworkers.

RealBasic 3.5—which runs on Mac OS X—adds a complete set of tools for controlling nearly every aspect of Microsoft Office. (Microsoft includes a free trial version of RealBasic 3.5 in the Value Pack folder on the Office v.X installation CD.)

Keeping It Simple

RealBasic strives to simplify the programming process. To begin building your applications, you first create a user interface. To make the job easier, RealBasic includes a Window Editor that lets you drag and drop interface elements. Once your user interface is complete, you add code to give it functionality. This is where RealBasic’s advantage over Office’s Visual Basic Editor truly shines, thanks to its powerful code tools, superior debugging capabilities, and better user interface.

You can test the interface and code as you work. Once you have them set to your liking, building a Mac- or Windows-compatible application is only a menu click away. You can then use and share this application just as you would any other.

Putting RealBasic to Work

Business users will be the first to stand up and take note of the possibilities offered by RealBasic Office Automation. For example, with three or four macros, you could cross-reference your customer database on the West Coast with your billing database on the East Coast, create a form letter for each delinquent account, save the letters as Word documents, and e-mail them to your customers. Or say you need to batch-process hundreds of images from your company catalog, overlaying a company logo and a product description—the macro could do it.

With RealBasic, these scenarios are not only possible but also relatively easy to put into action. A moderately experienced RealBasic user could produce most of these tools in mere hours.

With RealBasic 3.5, Mac users can finally exploit the timesaving features Windows users have enjoyed for years. The ease with which a business user can create cross-platform applications that automate Office workflow makes RealBasic a must-have addition.—ERICK TEJKOWSKI

Comprehensive QuickTime

PowerPoint 2001 introduced the ability to turn presentations into QuickTime movies, but the movies were more limited than the original presentation, lacking interactive features such as hyperlinks and slide transitions. PowerPoint X’s movies now look and act more like the presentation running inside PowerPoint, so presentations that you save as QuickTime movies and put on the Web or distribute on CD will display all of your presenting genius. You’ll also find support for the TV-style transition effects built into QuickTime, such as cross-fades and circle wipes, in addition to PowerPoint’s slide transitions set.

What Does It Need, and What Will It Cost?

A full installation of Office v.X will require about 200MB of disk space. Thanks to Mac OS X’s intelligent memory management, there’s no need to muck about with application memory settings, as was sometimes the case with Office 2001; as long as you have at least 128MB of RAM, Office v.X should run fine. You’ll also need to run Mac OS X 10.1—Office v.X requires it.

Cost of Admission Office v.X will sell for $499 when it’s available in continues
Getting Out of the Office

THE ARRIVAL OF MICROSOFT OFFICE v.X brings new levels of productivity and practicality to Mac OS X. But if you're looking for a way to process words or crunch numbers without kowtowing to the Microsoft behemoth, take heart: a handful of Office alternatives are available to the OS X user. Granted, none offers all the features of Office v.X. But honestly, when was the last time you threw together a PivotTable in Excel? And if all you need is a basic word processor, why shell out $499 for an entire suite of programs—some of which you may never even open? Here's a quick roundup of some lesser-known (and dramatically lower-priced) alternatives to Word, Excel, and PowerPoint in the world of Mac OS X.

Getting the Word Out
If you're looking for a Word substitute, the best of the Office alternatives by far is Apple's $79 AppleWorks 6.2 (800/692-7753, www.apple.com). AppleWorks is more than a word processor; like Microsoft Office, AppleWorks brings spreadsheet, database, presentation, and word-processing capabilities—along with some basic drawing and painting tools—to Mac OS X in one integrated program.

AppleWorks 6.2 offers everything you'd expect from a legitimate word processor: a good outliner, style sheets, support for embedded images and text-wrapping, easy-to-use tables, a spelling checker, and a thesaurus. Perhaps most significantly, AppleWorks 6.2 comes with all the DataViz translators needed to exchange documents seamlessly between current and earlier versions of Microsoft Word (compatibility stretches back as far as Word 6 on the Mac and Word 97 for Windows). Apple had removed these translators in version 6.0, turning the exchange of documents between AppleWorks and Word into a big headache. But with DataViz back in place, sharing documents with Microsoft Office users is so smooth that your colleagues probably won't even notice that you're not using Word.

Admittedly, AppleWorks 6.2 lacks some of Word's more sophisticated automation features, such as AutoCorrect and AutoText, both of which can save you a lot of keystrokes. You also can't record macros, customize menus and keyboard shortcuts, or do powerful mail merges in the program. But as a general word processor, AppleWorks 6.2 feels complete.

Looking for an even cheaper word-processing alternative? For $16, you can use FinalWord 2.1, from PineHill Products (716/349-2410, www.pinehillproducts.com). Billed as a text editor (as opposed to a word processor), FinalWord is designed primarily for editing plain text—not creating richly formatted documents.

Minimalist to the extreme, FinalWord offers little beyond the most rudimentary functions. Margin, tab, and paragraph-alignment controls are nonexistent. The Check Spelling command merely launches Rick Zaccone's Excalibur, a free third-party spelling checker you have to download separately. (And if you don't have Excalibur installed when you choose the Check Spelling command, FinalWord crashes.)

Despite its limitations, FinalWord offers some unexpected extras. For example, it has a built-in (albeit very basic) e-mail client. You can also use it to encrypt documents and create

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automatic backups. But none of this makes up for FinalWord's bugs. Many preferences and standard keyboard shortcuts are either missing or inoperable. Worse, FinalWord can't gracefully exchange data with other word processors such as Microsoft Word. You can open and save documents only as text files. In fact, if you need only basic word processing tools, you may be better off with TextEdit, which is free with Mac OS X.

**Doing the Math**

Number crunchers looking for Excel's capabilities in a smaller, less expensive package can choose from two Mac OS X alternatives: the AppleWorks 6.2 Spreadsheet module and the $99 Mesa 3.0.1 by P & L Software (www.plsys.com).

The AppleWorks spreadsheet isn't as powerful as Excel or Mesa. For example, you can't create multiple worksheets, and the chart-formatting options are limited (you have limited control over attributes such as the thickness of gridlines, bars, and lines). Still, AppleWorks is easy to use and offers more than 100 different formula-building functions—more than you'll probably ever use—and they are well documented in the AppleWorks Help system.

When it comes to raw number processing, Mesa 3.0.1 is a viable challenger to Excel. It's a powerful and sophisticated spreadsheet program that supports the full range of mathematical, financial, and database functions you would expect. But Mesa also lacks some basic features (like a Zoom tool) and has some quirky, nonstandard interface elements (see *Reviews* in this issue). With Mesa, you can get your number crunching done, but the process is often less intuitive and involves more keystrokes than Excel.

**Show and Tell**

For building presentations in OS X, you've got two alternatives to PowerPoint. Again, you can really get your $79 worth out of AppleWorks and use its built-in Presentation module, or you can try the $120 UPresent 2.6.2 from CodeBlazer Technologies (612/336-9567, www.codeblazer.com).

The AppleWorks Presentation module is basic but functional—a very stripped-down version of what you get in PowerPoint. You create slides on which you can place text and graphics, and you then organize them in a slide show with a variety of transitions. What you don't get are a lot of animated text, bullet points that automatically appear one by one, or the ability to save your finished production as a QuickTime movie. You'll also need the full AppleWorks application to show your presentations.

UPresent, on the other hand, is a totally different type of presentation program—it puts the emphasis on graphics rather than text. It's designed to help you present collections of photos, animations, and movies in a slide-show format, but it lacks the text-outlining features you'd find in PowerPoint—features that most business users rely on.

Setting up a UPresent presentation is labor-intensive. You don't type on a blank slide but instead set up custom menus for each type of media that you want to include. You then use these menus to quickly display a particular image or movie on screen. Unfortunately, you can display only one image per slide—a serious limitation. This is as confusing as it sounds. Don't expect to get anything done without reading the manual. UPresent can be useful for creating simple portfolio-style slide shows of images, but trying to create more-sophisticated presentations with it is frustrating. The program offers very few transition effects, and most of them look amateurish. Most important, combining text and graphics on a UPresent slide is absurdly difficult.

**The Outlook**

If this sampling of alternatives to Microsoft Office seems just a bit anemic, remember that Mac OS X is still in its infancy; limited options are to be expected at this point. As software developers see more people becoming full-time Mac OS X users, better alternatives to Office are sure to come.—JOSEPH SCHORR
The People behind the Program

MAC FANS AT MICROSOFT? It may seem like a contradiction, but according to Kevin Browne, general manager and a founding member of Microsoft’s Macintosh Business Unit (MacBU), that’s exactly what he and his teammates are.

The MacBU is the group of product developers, programmers, and strategists responsible for bringing powerhouse programs like Microsoft Office v.X to the Mac. But despite what many people may assume, Browne emphasizes that MacBU members are not Windows users forced to grudgingly write code for the Mac. In fact, their programmers don’t write any Windows code. Although technologies at Microsoft are shared between the Windows and Mac product groups, the MacBU is an independent entity, free to add or cut features based on what it thinks Mac users need and want.

The MacBU was formed in 1997 after the failed release of Office 4 and its update, Office 4.2. Before this time, the Windows and Mac teams at Microsoft worked together on new product releases—completing roughly 80 percent of the code before beginning the process of preparing it for a specific platform. The result was a Mac program that seemed built for Windows users.

“Office 4.2 was a bad product for our customers—it almost killed Microsoft on the Mac,” said Browne. “We’re still recovering in many ways: recovering our reputation with customers, recovering the trust level customers have with us.”

After evaluating the failure of Office 4, Microsoft decided to spin off the Mac group into its own business. The unit now writes code from the ground up specifically for the Mac.

But Browne thinks Microsoft has demonstrated its renewed commitment to Apple and Mac users over the years. Since the formation of the MacBU, the group has released Office 98, Office 2001, Internet Explorer 5, and Outlook Express 5. The release of Microsoft Office 2001 for Mac brought with it many improvements for Mac users, including many Mac-first features and greater compatibility with Office’s Windows counterpart. And Microsoft was one of the first companies to pledge support for OS X.

“The original mission of the MacBU was to bring a version of Office to the Mac,” said Browne. “Now, I look at the MacBU as having a mission to look at everything that Microsoft is building. We need to make sure we understand what the Mac customers want—what services they want—and then be able to provide those to them.”

To this end, two of the full-time employees at the MacBU spend their days collecting research data on what Mac customers want. This information is relayed to the rest of the team, who then decide if—and how—it can be implemented in a future version.

The MacBU has become more outspoken over the past year, as the group has gained confidence in its products. At Macworld Expo New York, during his keynote address, Browne asked Mac users to try the MacBU’s products and to let his team know about things they didn’t like—and to pass positive comments about Microsoft’s programs on to others.

“With Office 2001, Internet Explorer 5, and Outlook Express 5, my contention is that our Mac apps are among the best Mac apps there are,” said Browne. “If there’s something missing in our products, I want to know about it. But what I have a hard time with is when people use opinions that were formed or facts that were in evidence five years ago to talk about what we are doing with our products today.”—JIM DALRYMPLE

November 2001. For a limited time, an upgrade price of $149 is available to Office 2001 owners (either the whole package or any of the stand-alone programs) through Microsoft’s Web site. (If you don’t already own any version of Office, buying the Word + Entourage Special Edition bundle and then upgrading is the cheapest way to buy Office v.X.) After this offer ends, upgrades from Office 2001—as well as from Office 98 and previous versions—will cost $259.

Considering the relative paucity of new features in these upgrades, they may seem rather expensive. You’ll need to balance their cost against the benefits of running native Mac OS X applications.

**Mac OS 9 Support** The Office 2001 package will remain available for users of Mac OS 9 and earlier, but it has been placed into “maintenance mode.” Updates, if any, will be bug fixes and changes needed to maintain compatibility with possible future classic Mac OS releases. But any significant Office development will occur on OS X.

**The Last Word** The initial release of Mac OS X was embraced by early adopters and the curious, but for most of us, it didn’t improve on the way we were working in Mac OS 9—quite the opposite, in fact. But the one-two productivity punch of Mac OS X 10.1 and Office v.X can’t be ignored, nor can Microsoft’s commitment to OS X. If you use Office and you’ve been sitting on the fence, wondering whether you should move to Mac OS X, Office v.X is a good reason to make the leap and hit the ground running. m

Contributing Editor TOM NEGRINO has Office on the brain; he’s the author of the forthcoming *Microsoft Office v.X for Macs for Dummies* (Hungry Minds, 2002) and *Microsoft Office v.X Inside Out* (Microsoft Press, 2002).
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<td><strong>DV MasStor</strong></td>
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- LVD, HVD and Single Ended SCSI Storage Systems
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<td><strong>SCSI-3 Ultra Wide and Ultra160</strong></td>
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<td><strong>MasStor FW</strong></td>
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- Exceptional Value and Performance |

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Turn Cassettes or LPs into CDs

By Jonathan Seff

If you’re like most people, you’ve spent years building your music collection. From Elvis on vinyl to Kiss on eight-track to Men at Work on cassette, you bought tons of tunes before digital was an everyday word, and before you’d even heard of compact discs. But now CD is the de facto official format for recorded music, and many of those gems you bought years ago just aren’t available on disc. And even though some are, you’ve already bought the music once, so why spend another $18 on it?

Thanks to your Mac, you don’t have to.

If you have a CD burner, either built-in or external, you can use it and your Mac to capture audio from a tape or LP, eliminate unwanted noise in the recording, and transfer your music to CD so you can listen to it in your car, at the office, or anywhere else you like to play CDs.

Several programs are made for the task, such as the free Coaster (www.visualklick.de), $30 Sound Sculptor II (http://hometown.aol.com/sculptorii/index.html), and $35 Sound Studio (215/482-6664, www.felttip.com/products/soundstudio/). CD Spin Doctor and AudioScribe are included with popular CD-burning programs, such as Toast.

There are more-expensive ways to go. But if you don’t have an audiophile’s budget, if you have more than a couple of records or tapes to convert, and if you want the easiest, fastest method and the best-quality digital recording, here’s what we suggest: use BIAS’s Peak LE to transfer the analog recording to your Mac, Arboretum Systems’ Ray Gun to remove unwanted noise, and Roxio’s Toast 5.0 Lite or Toast 5.0 Titanium to burn the music to CD.

What You’ll Need

- A Y-cable, which has two stereo RCA plugs on one end and a ¼-inch stereo miniljack plug on the other. Y-cables are available from most electronics stores for about $5.
- Your turntable or cassette-deck stereo component. If you’re using a turntable, you’ll also need a stereo receiver or pre-amplifier (available at most electronics stores for about $50).
- Records or cassette tapes.
- A soft cloth or device designed for removing dust and dirt from record surfaces. You might also consider replacing the phonograph needle.
- A tape-head cleaner or even a new, inexpensive tape player if yours is old and dusty. This will ensure that you get the best sound from your cassettes.
- An inexpensive USB audio-input device, or a PCI sound card if your Mac doesn’t have an audio-in port (like many of the newer Mac models). See step 1 for suggestions.
- Plenty of hard-drive space, since CD audio takes about 10MB per minute. A typical album will eat up between 400MB and 700MB.
- A CD-R or CD-RW drive.
- Roxio’s Toast 5.0 Lite (which is included with Peak LE, and a version probably came with your CD burner) or $99 Toast 5.0 Titanium (408/635-7694, www.roxio.com).

More Info:

- www.macworld.com/2001/07/reviews/cdburning.html
- Read our comparative review of CD-burning software.
- www.macworld.com/2001/02/reviews/peak.html
- See what Macworld thought of Peak VST 2.5.
- www.macworld.com/2001/10/reviews/soundblaster.html
- Get the lowdown on the Sound Blaster Live PCI sound card.
Set Up Your Hardware  Connect your turntable or cassette player to your Mac. You’ll need a receiver or preamplifier if you’re transferring records, and an add-on sound-input device if you have a newer Mac.

How you set up will depend on your Mac model and whether you’re transferring from cassette tape or vinyl.

You’ll transfer audio to your Mac via the computer’s audio-input port. If your Mac doesn’t have one, as is the case with many of the newer models, other low-price options include Griffin Technology’s $35 iMic or $99 Power-Wave (615/399-7000, www.griffintechnology.com), both of which connect via USB. Alternatively, you can install a PCI sound card such as Creative’s $100 Sound Blaster Live (800/998-5227, www.creativelabs.com) or M-Audio’s $230 Audiophile 2496 (626/445-2842, www.m-audio.com).

If you’re recording from a cassette deck, you can insert the end of the Y-cable with the two RCA plugs directly into the output port on the back of your component. Plug the mini-jack end into your Mac’s audio-in port (most likely indicated by a microphone icon).

If you’re recording from a turntable, however, you’ll need an additional item. Because most turntables lack built-in amplification, you’ll need to plug the turntable into a stereo receiver or preamplifier. Then run the Y-cable from an output port (such as Tape Out) on the receiver to the Mac’s audio-in port.

Install and Set Up Your Software  Now install Peak LE and Ray Gun, and configure Peak LE to receive the audio signal. Also make sure your media is recorded in the proper format for burning to CD: 16-bit, 44.1kHz stereo AIFF.

Note: After you’ve installed the Peak LE software, be sure to download the latest update to prevent data corruption or loss (www.bias-inc.com/downloads/updates/).

In Peak LE, choose Record Settings from the Audio menu, and click on Device And Sample Format in the resulting window. From the pop-up menu on the upper left, select Source. Since you’ll be recording through your Mac’s audio input, choose Built-in from the Device pop-up menu and Sound In from the Input pop-up menu. (If you’re using a different device, such as the iMic, choose its name from the Device pop-up menu.) Select On from the Speaker pop-up menu so you’ll be able to hear your music as it’s being recorded.

Go back to the first pop-up menu on the left and choose Sample. Make sure that Rate is set to 44.10kHz, Size is set to 16 bits, and Use is set to Stereo. Click on OK.

continues
Record Your Music

Now that your system and software are set up, you can start digitizing your record or tape collection. It's easiest to record each album or tape onto your hard drive as one large file.

Eliminate Unwanted Noise from Your Recording

Using the Ray Gun plug-in, you can clean up audio recorded from your tapes and LPs, by removing many of the hissing and popping sounds associated with analog recordings.

To capture the best-quality audio, clean your tapes and records, or replace your turntable's phonograph needle.

Open Peak LE's Record dialog box by clicking on the Record button A in the tool bar.

You'll now see how many minutes and seconds of music you can record B (based on the space available on your hard drive). Make sure the window indicates that it will be recorded at the audio-CD standard: 16-bit 44100Hz Stereo AIFF C.

Now click on the Record button D in the Record window, and begin to play your record or tape. The waveform being recorded will appear in the Audio Source Display area on your Mac, as will moving, colored input lights on the bottom of the screen.

When you reach the end of the first side, click on the Pause button E, turn over the record or tape, and click again on Pause.

When the recording is finished, click on the Stop button F and save the file.

Now you can delete unwanted silences by highlighting the blank space and pressing the delete key. However, don't delete silent spaces between songs yet.

Note: Before you install the full version of Ray Gun, remove the Ray Gun demo version that comes preinstalled with Peak LE (in the Peak Plug-Ins folder).

In your new file, highlight a section that has hisses or pops. From Peak LE's Plug-Ins menu, choose Premiere and select Ray Gun 1.2.0 pr.

With the Ray Gun interface, you can begin modifying the sound on your recording. Start with one of the presets found in the pop-up menu A and then move the sliders to get the desired results.

To audition the highlighted part of your recording with your Ray Gun changes, click on Play B with the various fixes turned on. Once the music sounds right to you, go back to the pop-up menu, click on Save, and enter a name for your new preset. Toggle the In/Out button C to hear the music with and without the changes you've made.

Now click on Cancel D, select the entire file you want to fix, and relaunch Ray Gun. From the pop-up menu, choose the preset you created and click on Apply E.

This is nondestructive editing. If you don't like what you've done, you can undo it.
Normalize Low Levels  Often, the music you capture will be very quiet. Normalizing is a good way to fix that problem before burning to CD—and it’s much safer than recording at high volume, which can lead to digital clipping, or distortion, that shows up as static and clicks.

Normalizing is the process by which the software analyzes your entire recording’s waveform, takes the highest point, amplifies it as high as it can go without clipping, and brings the rest of the music up proportionally.

In Peak LE, choose Normalize from the DSP pull-down menu. By default, the program will normalize 100 percent—that is, bring the highest point to its maximum safe level. Although there is a slider for choosing a lower degree of normalization, go with the default and click on OK.

After Peak LE has done all the calculations and processed the sound file, it will redraw the waveform.

Play the recording. If it was quiet to start with, it will be noticeably louder.

Insert Markers to Distinguish Tracks
Because you recorded your album to your computer as one big file, you’ll need to segment it into tracks that your CD player will recognize.

Peak LE uses markers to denote points of importance in an audio file. In this case, markers will show track breaks on a CD.

With your recorded file open, click near the beginning of the file and select Find New Marker from the Action menu (or press ⌘-M) to insert your first marker.

Then click on the white triangle at the bottom of the marker and drag it as far to the left as you can to indicate where your CD should begin.

Look for flat spaces—that is, areas of silence between tracks—in the waveform of the whole album. Go through the file, find where each song begins, and insert a marker. This tells the program where you want your CD to start the next track.

Note: You can also insert markers while the music is playing, by using the ⌘-M key combination. When you do so, Peak LE will add a marker wherever the play indicator is at the time you press the keys.

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Prepare the Tracks  Once you've marked where you want your songs to begin, you can choose one of two ways to prepare the files for the CD-burning process, according to your circumstances.

If you have lots of disk space to spare and you want to make MP3s from your recording before you burn the CD:

Press the tab key. Peak LE will highlight the waveform between the first two markers, which is your first track.

Go to the File menu, select New, and select Document From Selection. Peak LE will then copy the audio from the current highlighted area and paste it into a new document.

Save and name the file, and repeat this process for each song on your album. (To keep the tracks in order, start each name with 01, 02, and so on.)

If you want to use the fastest method and conserve hard-disk space, and if you don't want to make MP3s from your recording at this point:

Press the tab key and highlight a track area as described earlier. Instead of creating a new file, select New Region from the Action menu (or press shift-3-R) to create a region. The Edit Region window will appear; call it Track 01, and each subsequent region will automatically be named Track 02, Track 03, and so on. Click on OK.

Once you've completed this process for all the tracks, save your file.

Burn Your CD  Now for the moment of truth—when you put your precious music onto CD. Peak LE includes Toast 5.0 Lite, and you most likely got a copy with your CD burner when you purchased it.

If you exported track files individually, simply open Toast Lite or Toast 5.0 Titanium, select Audio, and drag and drop the files into Toast's Audio window. Here you can adjust the amount of blank space before each track except the first, since it must be preceded by a two-second pause. (Tapes and records have built-in space between songs, so set the gap for all the other tracks to 0 seconds.)

If you created regions in one file, select Contents from the Window menu. You'll see each of your regions listed by its name and by its start time on your disc.

Now go to the File menu, choose New, and select Playlist Document (or press shift-3-P). Drag the name of the large file containing all the separate tracks from the Contents window to your new playlist and click on the Bounce button (this "bounces" your files to Toast).

After a few minutes, Toast Lite will launch. All the regions from your playlist will appear as separate files, but their names will be different, since Peak LE sent Toast only temporary files. You can choose to burn a disc or cancel the operation; choose Cancel and click on the 2 Sec pop-up menu next to the tracks, changing it to 0 Sec. Then click on Burn.

Now you have a new CD of your old music!
Almost every color image in print consists of four ink colors: cyan, magenta, yellow, and black (CMYK). But CMYK can’t reproduce some parts of the spectrum, such as an electric blue or a metallic silver. These require spot colors. They also require finesse on your part, especially in Adobe Photoshop. Here we’ll show you techniques for using Photoshop’s spot-color tools correctly.

If you are coloring hard-edged vector artwork (such as Bézier shapes or type) with a spot color, it’s best to apply color in your illustration program or page-layout application. However, Photoshop is called for when spot colors are part of a bitmapped image. For example, spot colors are key to duotones, which typically boost the tonal range of black-and-white photographs by adding a spot color, especially in the highlights and midtones. You can also make an image pop by adding a solid spot color to just one portion of an image—for instance, printing your company logo in color in the middle of a gray-scale photo.

**Specifying Spots**

Instead of using ambiguous descriptions—“dark brick red,” for example—designers and printers rely on swatch books of numbered samples for spot-color names. Pantone (866/726-8663, www.pantone.com) makes the most-common swatch books in North America; spot colors are generally referred to by a Pantone Matching System (PMS) number.

The traditional way to add Pantone colors to Photoshop images is to convert a grayscale image to Duotone mode (Image: Mode: Duotone). But this technique doesn’t work when you want areas of solid spot color, because in a duotone image, every pixel is a blend of two or more inks.

When you want areas of solid color, you’d normally choose a color from Photoshop’s Color Picker (the dialog box you get when you click on the foreground or background color swatch in the Tool palette) and then paint or fill a selection. Photoshop lets you do this with Pantone colors too. The result, unfortunately, is a cruel joke: the color appears correct on screen, but when you try to print color separations, the spot color won’t separate onto its own plate. It appears on one or more of the other color plates, resulting in a muddy mess (because when you choose a color this way, you’re not picking a spot color—you’re picking an RGB or CMYK simulation of a spot color).

The only way to add a non-duotone spot color to a grayscale or CMYK image in Photoshop is to create a spot-color channel in the Channels palette. You can do this by clicking on the New Channel button at the bottom of the Channels palette, or by selecting New Spot Channel from the palette’s pop-up menu.

**Color and Solidity**

When you create a new spot-color channel, Photoshop lets you pick both the color and its solidity. But remember the most important rule when working with spot colors: Never trust how they appear on screen. Many spot colors can’t display correctly on screen, and even mundane colors often don’t appear properly because Photoshop displays only RGB and CMYK colors. Trust only printed swatch books (or request draw downs from your print shop).

Because you base your choice on a swatch book, you may think the new spot-color channel’s color and solidity settings don’t matter—after all, these affect only your
screen representation and prints made on desktop color printers.

But although you can’t trust what you see on screen, you still want something that looks passably correct. There is no solidity table for spot colors, so you have to experiment. Metallic color inks are generally opaque, so you should use a solidity of 90 or 100 percent. To simulate a varnish, which also counts as a spot color, pick a light yellow color and set the solidity to 0 percent. For most other colors, a solidity of 50 or 60 percent works well.

**Painting Spots**

Once you have your spot-color channel, you can paint on and add type to it. Keep in mind that each spot color is its own channel, so there are limitations. First, always paint or fill using black, white, or gray. When you place black text on the PMS 286 channel, for instance, it appears on screen as blue. (The same thing happens with the normal color channels: if you paint black just on the magenta channel, it appears on screen as magenta.) Similarly, white pixels on the spot-color channel indicate no spot color, and gray pixels indicate a tint of the spot color.

Second, you can’t put spot colors on layers—anything you put on a spot-color channel will appear in front of your other image data.

Finally, spot-color channels don’t automatically knock out the image data behind them. Spot colors overprint the other colors in your image; this may create a mottled look. When you want the spot color to print without anything behind it, you must set the pixels on the other color channels to white: set the background color to white, Ctrl-click on the spot-color channel, click on the composite-color channel (labeled CMYK, RGB, or Grayscale in the Channels palette), and press the delete key. Even better, after loading the channel as a selection, go to Select: Modify: Contract and choose to contract by one pixel. This creates a trap area, in case the spot color misregisters slightly on the printing press.

**Saving Spots**

When it comes time to save your Photoshop file and import it into a page-layout program, remember that only the native Photoshop (PSD) and DCS 2.0 file formats can handle spot-color channels, so don’t even think about using TIFF or EPS. However, QuarkXPress 4.X, Adobe PageMaker 6.X and 7.X, and Adobe InDesign 1.X can’t read spot colors in PSD files, so you should use the DCS 2.0 format if you work in one of those programs.

One notable workaround is the ImagePort XTension from A Lowly Apprentice Production ($99; 888/818-5790, www.alap.com), which lets you import native Photoshop files with spot-color channels into QuarkXPress. It also lets you turn the channels on and off, and even change the spot color itself.

When you import the DCS 2.0 file into a page-layout application, it automatically adds the image’s spot color to the document’s list of colors, so you can apply it to type or other elements on your page. However, don’t delete this color from the document: if you do, the program won’t be able to separate the spot color properly.

**Special Spot Effects**

People use spot colors in many ways. The following techniques can help your designs hit the sweet spot every time.

**Monochrome** When you want to apply a single spot color to an entire image—say, a light pastel color over a graphic to ghost it back—make a grayscale TIFF image in Photoshop and apply the spot color to it in your page-layout program. It’s easy to change the spot color later if you need to.

**Duotones** If you want a duotone-like effect but also require areas of solid spot color—for example, to put a solid-color corporate logo behind a CEO’s head shot—convert a grayscale image to Duotone mode (applying desired colors and curves via the Duotone dialog box). Then convert the file to Multichannel mode. Photoshop automatically creates the spot-color channels, ready for you to paint on or add type to. Again, save the multichannel file in the DCS 2.0 format so it separates properly in your page-layout program.

**Bump Plates** If you’re using a spot color to boost specific colors in your image (for example, making a red car appear more vibrant by adding a red spot color in that area of the image), you should take a look at CoCo ($300; 877/940-0600, www.thepowerxchange.com). This Photoshop plug-in is the best way to build bump plates of this kind. Similarly, CreoSciTex’s Silvertone plug-in is designed to make bump plates for metallic colors, such as the chrome on a car bumper ($250; 800/472-2727, www.creoscitex.com).

**Expand Your Spectrum**

Limiting yourself to printing only gray-scale or CMYK colors is like settling for a small box of crayons. Many printing presses today are set up to handle five- or six-color jobs, so it’s easier than ever to get the rich colors you crave.

Web Publishing Secrets

Whether you hand-code your Web pages or let a WYSIWYG application generate tags, you probably author in HTML. But the World Wide Web Consortium now recommends XHTML, a hybrid that works much like HTML but is based on XML, a super markup language. And making the switch to XHTML is easy—you’ll learn everything you need to know in this tutorial.

Many Benefits, Little Work
Moving your existing sites to XHTML—and using it to create new sites—can help you in several ways.

Painless Transition The Web is moving to the powerful markup language XML (see Inside XML, October 2000). Writing well-formed, valid XHTML pages is the easiest way to make the transition.

More-Logical Markup XHTML brings uniformity to your document structure, forcing you to dot your i's and cross your t's. The rules of XHTML help restore the structural integrity of documents that was lost during the Web’s rapid expansion between 1994 and 2001. This is critical for large corporations (and for organizations such as libraries and universities) whose Web pages must work well with logically marked-up documents in legacy systems and databases.

One Size Fits All Unlike with old-style HTML pages, you can easily repurpose valid, well-formed XHTML documents for wireless devices, Braille readers, and other specialized Web environments. Moreover, XHTML’s insistence on clean, rule-based markup helps you avoid the kind of errors that make Web pages fail even in traditional browsers.

XHTML Is Accessible Because they follow strict rules and avoid nonstandard markup, well-authored XHTML pages are more accessible than old-school HTML pages, helping you comply with U.S. laws (www.usdoj.gov/crt/508/508law.html) and Web-accessibility guidelines (www.w3.org/WAI/).

The Rules of XHTML
XHTML is nearly identical to the HTML you use every day—there are just a few additional rules.

Open with the Right Tags XHTML documents must begin with tags that tell the browser how to interpret them (see “Start at the Top”).

Use Lowercase Tags XML, and therefore XHTML, is case sensitive. XHTML tags and attributes must be lowercased, or your document will not validate. (Validation ensures that your pages are error free. See Web Publishing Secrets, September 2001, for details.)

To “translate” an older document into XHTML, you would recast, for example, <TITLE>My Totally Valid Web Site</TITLE> as <title>My Totally Valid Web Site/title>. All you’ve done is lowercase the title tag. Likewise, P becomes p, BODY becomes body, and so on.

The free World Wide Web Consortium (W3C) tool Tidy (www.w3.org/People/Raggett/tidy/) can automatically convert hundreds or even thousands of Web pages from uppercase to lowercase tags, making it easy to update even very large sites. Professional Web-editing tools for the Mac have also been upgraded to generate XHTML-style tags. (More on that shortly.)

Quote Your Attribute Values In HTML, you don’t have to put quotation marks around attribute values.

In XHTML, however, there must be quotes around each and every attribute value—for example, height="55", not height=55. Once again, Tidy can automatically do this work for you.
Close Everything  In sloppy old HTML, you are able to open tags such as p and li without closing them. For example, the following is perfectly valid HTML:

```html
<p>This is a paragraph. Where will it end?
<p>Who cares? Let’s just start another.
```

This open-ended approach to things made sense when the Web was young. The fewer rules HTML had, the easier it was to learn. Similarly, early Web browsers forgave inconsistent, sloppy, and even invalid HTML (and many of them still do).

All that sloppy HTML has taken its toll on the Web’s structural integrity and can wreak havoc with technologies such as Cascading Style Sheets. For instance, if you apply a style to a paragraph that you haven’t closed, a browser may not close the style, either. XHTML forces you to use correct syntax by insisting that you close every open tag:

```html
<p>This is a paragraph. Where will it end? Right here.</p>
<p>This is a new paragraph. You can tell because the previous paragraph is now closed.</p>
```

The Incredible Self-Closing Tag  Having to close tags such as p and li is logical enough, but what about “empty” tags such as br and img? In creating XHTML, the W3C decided that those elements should close themselves by including a forward slash at the very end of the tag: `<img src="clown.gif" />` should now be `<img src="clown.gif" alt="A circus clown." title="Clown Emmett Kelly demonstrates the squirting-flower trick." />`

Tools and Shortcuts  Several applications let you produce Web pages in XHTML. Hand-coders may want to investigate Bare Bones’ BBEdit ($119; 781/687-0700, www.barebones.com), Optima System’s PageSpinner ($29.95; www.optimasystem.com/pagespinner), and Mozquito Technologies’ Mozquito Factory ($249, boxed with printed documentation; $149, download only; www.mozquito.com).

Dreamweaver fans can either hand-convert Dreamweaver-generated pages to XHTML or download XHTML extensions such as the Super HTML-XHTML DTD extension or the XHTML-compatible Meta Generator extension (www.macromedia.com/exchange/dreamweaver/).

Converting to XHTML is easy—and how often can you say that about new Web technologies? But don’t let the smooth taste fool you: there’s a lot of power behind this easy-to-work-with technology. Learning the simple rules of XHTML today is the best way to prepare yourself and your sites for the XML-driven Web of tomorrow.

JEFFREY ZELDMAN (www.zeldman.com) is the author of Taking Your Talent to the Web: A Guide for the Transitioning Designer (New Riders, 2001) and the creative director of A List Apart (www.alistapart.com), a weekly online magazine for people who make Web sites.
Tell the truth: you're a bit intimidated by Mac OS X. The Aqua interface isn't a problem, but OS X's Unix underpinnings can bring out the technophobe in anyone. Mercifully, Mac developers are rushing to the rescue with utilities that let you tap Unix services—for everything from scheduling tasks to running an industrial-strength Web site—without having to use the still-daunting command line.

Under the Hood
Beneath OS X's surface is an array of Unix programs (called “services”) that handle jobs such as Web serving and security. Each has its own set of controls and method of configuration, usually involving a text file—unfamiliar territory to many Mac users. OS X’s System Preferences provides access to some settings but not all of them, and many optional features are turned off in the default installation.

Mac vendors and developers are now offering new utilities that provide users either a Mac-like graphical interface on top of a traditional Unix service or an improvement on existing features in OS X.

Most of these utilities require that BSD Unix Subsystem be enabled. Although this package was a standard part of the Mac OS X 10.0 installation, Mac OS X 10.1 reduces it to an option. When installing the OS X 10.1 update, make sure the BSD Subsystem option is selected (in the Custom Install window).

Productivity Helpers
OS X's Unix side can make for some unwelcome chores that intrude on your workflow, but two utilities aim to improve your productivity.

As new OS X users soon discover, Unix is much more vigilant than the classic Mac OS about restricting access to shared files—and setting permissions using the standard Show Info command can become a time-consuming and tiresome task. Longtime Mac developer Bare Bones Software offers Super Get Info ($20; 781/687-0700, www.barebones.com), which improves on and simplifies the Show Info window.

Super Get Info provides a window that allows you to quickly view file information, permissions, and a preview of a file's contents. Even better, it can open multiple windows so you can compare settings among files and then apply group, owner, and permission settings to a file or even all items in a folder. And instead of a thumbnail, the preview image is big, providing a real look at the file.

Another new and useful utility is Cronnix 1.4.1, by German developer Sven Schmidt (www.koch-schmidt.de/cronnix/). This free software applies an Aqua interface to cron (or crontab), the powerful task-scheduling scripting service. With OS 9, you have to buy a separate task-scheduling utility, but this function is built into OS X, so why not take advantage of it?

Let's say you want to schedule a weekly AppleScript that backs up certain files on your hard drive. You can drag and drop that AppleScript (or any script, such as a CGI script or PerlScript) into Cronnix to easily build the schedule, instead of having to type the path names and directory structures in the Terminal window. Composing the command via Terminal wouldn't be terribly difficult, but it's just not the Macintosh way.

Firewall Utilities
In the classic Mac OS, Web sharing is relatively secure, but in OS X you must be more careful. If you decide to allow remote log-in via Telnet or to run a Web server
IPso Facto  The Moose's Apprentice 10.1.4 provides an editor for many settings, such as IP filters. It notifies you of any modifications to the settings and lets you undo unwanted changes.

(see Mac OS X Secrets, November 2001), you’ll need some additional security and adjustment of ports. Mac OS X comes with ipfw, a network-firewall package, and because ipfw has been extended by third-party developers, you no longer have to make a trip to the Terminal application to use it.

To that end, Brian Hill says he designed the $25 BrickHouse 1.1b5 Firewall utility (http://personalpages.tds.net/~brian_hill/brickhouse.html) with the Web-serving novice in mind. In addition to an easy interface, it comes with settings that help prevent denial-of-service and other resource-based attacks over the Internet. It also provides filters for common network configurations, such as DHCP (dynamic host configuration protocol), frequently used with broadband access.

One of BrickHouse’s competitors, Mike Vannorsdel’s $25 Firewalk X 1.3.7 (www.pliris-soft.com) provides feedback on your firewall’s status, sending notification via e-mail when a new event occurs. Using Firewalk X, you can create and save different sets of rules and switch between them on-the-fly.

A different security tack is offered by WunderMoosën's The Moose's Apprentice 10.1.4 (www.wundermoosen.com). This $15 utility generates a daemon that compares important system files to their last saved versions. If a file has been modified without your knowledge, The Moose's Apprentice will alert you and let you step backward though the file's history to undo the unwanted changes.

Web Administration Made Easier
Mac OS X comes with the industrial-strength Apache Web server, which provides great performance—yet its installation and administration can be arcane to many people who run Web sites (see Mac OS X Secrets, August 2001).

A company with much experience developing Unix and Apache for the Mac, Tenon Intersystems offers iTools 6.1 (800/662-2410, www.tenon.com) for Mac OS X and Mac OS X Server. The $399 package ($299 for users of Tenon’s MachTen and WebTen products or any commercial Mac OS-based Web server software) brings Aqua and HTML interfaces to Apache, so someone other than a Unix guru can administer the server.

Supporting remote administration, iTools provides a wide range of extras for Apache, including support for the Secure Socket Layer encryption protocol used in online commerce; WebMail, a service that lets remote users access their mail; a domain-name server; and a search engine. The package also comes with a set of third-party Apache modules.

Tracking the visitors to and usage of your site is very useful, but reading log files containing that information can be overwhelming. Flowerfire CQ now offers an OS X CGI version of its powerful Sawmill 6.2.1 server-log-analysis tool ($99 for one user, $399 for an organization with fewer than 50 users; 650/219-4923, www.flowerfire.com); according to the company, it runs three times faster than the Carbonized Mac OS X version. While providing general statistics such as a list of the ten most popular files on your server, Sawmill allows you to analyze usage patterns on your site by tracking each visitor’s progress, page by page. On top of all that, it can provide live statistics and lets you use custom filters to analyze viewing habits.

More Than Just a Pretty Face
Some utilities are only for serious work, but TinkerTool 1.5 (www.bresink.de/osx/) also appeals to Mac users’ lighter sides. Marcel Bresink’s freeware controls a grab bag of hidden preferences in the Finder. Some are minor, such as animation effects in the Dock; however, others provide more functionality. For example, TinkerTool can fine-tune font antialiasing to improve appearance on low-resolution analog displays, or it can show Terminal in a transparent window.

But keep in mind that TinkerTool’s feature set may change often, depending on the settings that Apple engineers decide to implement (or hide) in each release of OS X. Some features in earlier versions have been rolled into the current Finder’s Preferences panel. “In an extreme case, none of TinkerTool’s features might survive, but I don’t really expect that,” says Bresink.

A Moving Target
The field is wide open for Mac OS X utilities such as these. Programs will come from commercial developers, as well as individuals who start out writing small applications to simplify their lives and then offer those apps for free to the Mac community. Of course, as Mac OS X evolves, we can expect some of these improvements to make their way into the standard OS.

Now dusting off his Unix grep manuals, DAVID MORGENSTERN is a freelance editor and was once the editor of MacWeek.

More Info:  www.macworld.com

For links to the software mentioned in this article, visit Macworld.com and type OSXSecrets in the Search box.
Mac 911

Filled as I am with the spirit of giving during this holiday season, I give you in this month’s column the lowdown on how to install multiple operating systems under Virtual PC, what your surge protector can and can’t do for you, how to determine which extensions are expendable, why worms are harmful not only to cats but also to computers, and the ins and outs of disk formatting.

**Multi-OS VPC**

**Q.** I would like to run Connectix’s Virtual PC on my Mac. Though I have a copy of Windows 2000, do I need to buy the Windows 2000 version of Virtual PC? Or can I purchase the less expensive DOS version and install my own copy of Windows 2000?

**PRZEMYSŁAW KROJČER**

New York, New York

**A.** This is the kind of save-a-buck spirit I admire—particularly in this challenging economic climate. You can indeed save several dollars by purchasing the DOS-flavored version of Virtual PC (VPC) rather than the one smothered in rich—nay, fatty—Windows 2000 sauce. Virtual PC for DOS costs a mere $100 while VPC for Windows 2000 is priced at $250. The Windows 98 and ME versions cost $200 each (800/950-5880, www.connectix.com).

Installing an additional OS isn’t difficult. Simply launch Virtual PC, tell it you’d like to create a new machine, name that machine, and select the Guide Me option.

Next, create a new drive image and tell VPC what sort of OS you intend to install—in your case, Windows 2000. Start the virtual machine and insert your Windows 2000 CD, letting it mount automatically. Press any key to continue, choose the option to boot from the CD, and watch as Windows slowly does its stuff.

If the OS you’re installing requires a floppy disk to boot, you’ll have to hunt around for a Mac with a floppy drive and then use Apple’s Disk Copy utility to create a disk image of that floppy. When it’s time to boot the virtual machine, drag your newly created floppy-disk image to VPC’s floppy-disk icon.

**A Shocking Affair**

**Q.** In a recent column, you suggested disconnecting your Mac’s modem from your surge protector to speed up the modem. Doesn’t that make your modem more susceptible to damage from power surges and spikes?

**ALEX GRANT**

San Bernardino, California

**A.** Possibly. I weasel for this reason: should lightning travel from the heavens, through power lines, and into your home, anything but an industrial-grade surge protector would collapse under the strain—allowing devices attached to it to be thoroughly charred. This is why prudent souls unplug their computers (and any other electronic devices they cherish) when such celestial fireworks begin nearby. They also remove any phone cords leading into those computers (electricity can zip down phone lines too).

Even with the kind of less severe surges created by heavy-duty appliances or your local power company, some surge protectors may provide no protection at all. Cheapo surge protectors don’t respond quickly enough to keep deadly surges and spikes at bay.

A quality surge protector—one that protects from most common surges but not from direct lightning strikes—costs between $50 and $80. But there are more-concrete ways to tell if yours is up to snuff. First of all, be sure it meets the UL 1449 Compliance Standard. This safety standard dic-
tates how much voltage is allowed to pass through the protector. In addition to this standard, look for a rating of 330V or less. Your surge protector should also have a response time of no more than five nanoseconds—one nanosecond is preferable. And a device with a failure light provides greater protection—surge protectors can burn out, leaving your gear vulnerable. Finally, get a surge protector that carries a couple of phone jacks or DSL/cable/satellite jacks. Errant electricity can travel down these connections as well, and if it does, it could fry both your modem and motherboard if you’re not using a surge protector.

What’s That?
Q. Each time I upgrade Mac OS or QuickTime, more extensions are added to my hard drive. Which ones can I delete?
ED SHERRILL
Jacksonville, Florida

A. This question seems to return to us with the same regularity as the monarch butterfly to California’s Monterey peninsula. Unlike that airborne caterpillar, however, it will soon return no more. For better or worse, with Mac OS X, extensions and control panels are a thing of the past.

Until you make the leap to OS X, you can open the Extensions Manager control panel to see which of the OS 9 add-on doodads your Mac requires. Select Mac OS 9.1 Base (or whatever version of the OS you’re running) from the Selected Set pop-up menu, and scan down the list of items. Apple has put a check mark by items it feels are essential for the proper operation of your Mac. But even this list contains far more active items than are necessary.

The trick is to learn what a particular add-on does so that you can make an informed decision about whether to terminate it. There are loads of ways to gain this information. You could, for example, open Extensions Manager, click on an item, and then click on the Show Item Information triangle to reveal a window that provides you with a terse description of that item. I’ve also found it helpful to view items by package (select As Packages from Extensions Manager’s View menu). This groups related items in a way that helps you understand what particular add-ons do, and if it does, it lets you enable or disable a slew of items with a single click.

There are also a few third-party tools that can help. Casady & Greene’s terrific $60 extension-managing utility, Conflict Catcher 8 (800/359-4920, www.casadyg.com), will, among other things, impart the purpose of most extensions and control panels you throw at it. Teng Chou Ming and Peter Hardman’s $20 Extension Overload (www.extensionoverload.com) is another good source of information, and like Extensions Manager and Conflict Catcher, it allows you to manage sets of extensions. Dan Frakes’s hopefully-updated-to-include-MacOS-9.2-by-the-time-you-read-this $20 InforMinIt (www.informinit.com) is another favorite. InforMinIt distinguishes itself by providing exhaustive information about the purpose of any extension or control panel that you’re likely to encounter.

Worrisome Worms
Q. I’ve heard about the recent outbreaks of the Red Alert worm and wonder if my iMac running OS 9 is safe.
BEVERLY MITCHELL
Yellowknife, Northwest Territories, Canada

A. From direct attack, it is. But that doesn’t mean you’re out of the woods.

As you probably know, most computer viruses are designed for the enjoyment of Windows users. But cooties such as the Red Alert and Sircam worms can cause enough collateral damage to seriously muck up a Mac user’s day. How so? Last summer, Code Red flooded enough ISP servers that many ISPs shut down their users’ ability to run personal Web servers. Code Red also disabled a number of routers—routers used by both Mac and PC folk. Sircam wasn’t nearly as devastating, but it did cause a load of annoying messages to appear in Mac users’ inboxes.

There’s little you can do to protect yourself from such collateral damage. If a computer-toting sociopath decides to exploit one of the many security breaches in Microsoft’s operating systems for the pure naughtiness of it, you’ll just have to ride it out. In the case of a Sircam-like worm, you can create an e-mail filter that automatically trashes any files whose body contains a phrase associated with the virus (Sircam e-mail contained the phrase “I send you this file in order to have your advice,” for example).

Mac-specific viruses are still quite uncommon—so much so, in fact, that I haven’t contracted a virus on one continues.
of my Macs in years. I still use virus-protection software to be safe, but so far it's hardly paid for itself.

That will likely change with OS X, however. The core of OS X—Unix—has been around for a long time, and there are plenty of folks out there who know how to exploit its weaknesses. When I begin doing real work in OS X, I'll be on the lookout for an OS X-compatible virus-protection utility.

**Formatting for Matt**

**Q.** I recently purchased a new, higher-capacity hard drive and moved all my old data to this drive. I now want to erase my old hard drive and am confused about the terms initializing and formatting. What's the difference, and how do you perform these procedures?

**Matthew Tillson**

Buffalo, New York

**A.** When you want to erase a drive quickly—without actually wiping most of your data from the drive or checking the drive for defects—you'd choose to initialize the drive (also known as performing a high-level format). Initialization doesn't remove the data from your drive; rather, it expunges its directories—the information the drive uses to locate files. That's one reason initializing takes just a few seconds.) Consequently, you can still recover old data from a drive after initialization.

To sweep the data off your drive entirely, you'd choose a low-level format. This wipes out not only the drive's directories but also its data. During a low-level format, the formatting software seeks out bad blocks on the drive—physical areas of the drive that the software determines are unreliable—and maps them out so your Mac can't write to them. A low-level format takes much longer than a high-level format (as long as an hour for a multigigabyte drive).

Note that while you can do a low-level format on a SCSI drive with Drive Setup 1.1.7 and later, you can't do it with an ATA drive. To more thoroughly wipe an ATA drive, you'd instead choose the Zero All Data option. This overwrites the drive with a sequence of zeros—making it far more difficult to recover data from the drive. (Note that such formatting is not up to Department of Defense standards, so if you want to really scramble data, use a sterner tool such as Wipe Info, part of Symantec's Norton Utilities.)

Performing each of these operations is simple. Just launch Drive Setup (found in the Utilities folder of your Applications folder in OS 9.1), select your drive, and click on the Initialize button. To perform a high-level format, click on Initialize again.

If you prefer a low-level format, select Initialization Options from the Functions menu. In the resulting window, select the Low-Level Format option (you can also choose Zero All Data in the same window). Select the options you want and click on the Initialize button to wipe your drive.

**Unsolicited Advice**

Have a seemingly dead Mac? So did I—until I gave an oft overlooked button, found in many late-model Macs, a push. Here's my story:

While testing a Power Mac G4/733, I shut down the computer, swapped in a couple of 128MB RAM modules, and pressed the power button; then . . . nothing happened. The Mac designed to play an error tone, and that, my friends, was that.

Knowing the RAM worked perfectly well in another Mac, I zapped the PRAM by holding down the 3–option-P-R keys at start-up in an attempt to bring the Mac to life. This catchall correction can generally fix such wayward behavior. In this case, though, there was no change.

I then shut down the computer, opened the case, and eyeballed the RAM to be sure it was properly seated. That's when I spied the tiny CUDA button near the battery (see "Woulda, Shoulda, CUDA")—a button that, when pushed, resets the Mac more thoroughly than a PRAM zap. I gave the CUDA button a two-second push and closed the case, and the Mac booted up with nary a complaint.

Lesson learned? When zapping the PRAM won't do the trick, give your Mac's CUDA button a try.
## ADVERTISERS AND PRODUCT INDEX

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<td>macworldexpo.com</td>
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Macworld Conference & Expo
The Moscone Center
San Francisco, California

Conferences January 7-11, 2002
Expo January 8-11, 2002

Register Online
by January 6 for special savings
www.macworldexpo.com
Macworld
Conference & Expo.

The must-attend staple of the Mac community in 2002!

Macworld Conference & Expo is more than a conference and more than an exposition. For anyone that uses a Mac in their careers or personal lives, or is interested in Mac hardware, software and peripherals, Macworld Conference & Expo is the best place to enhance your knowledge.

As an attendee at Macworld Conference & Expo, you will join tens-of-thousands of users...

- to learn from the extensive conference programs
- network with peers
- hear about the leading solutions
- test-drive the newest products and services
- demo the latest applications
- gain recognition
- purchase technologies designed to improve your business and your life

The evolution continues.

The spring 2001 release of Mac OS X put unprecedented power and interface elegance into the hands of Mac users. As we prepare for Macworld Conference & Expo/San Francisco, the imminent release of Mac OS X version 10.1 evolves the story of the most significant change in the Macintosh user's computing experience since the introduction of the PowerPC. We're pleased to present you with a comprehensive conference agenda that looks under the hood of the new OS. With over 30 conference sessions specifically covering Mac OS X topics — and just about every session discussing how Mac OS X affects their application — we've got Mac OS X covered for you with content that is available exclusively at Macworld Conference & Expo.

Join us and expand your Macintosh horizons!

Visit www.macworldexpo.com for complete schedules and program updates!

Register online with your Priority Code by January 6, 2002 to take advantage of discounted rates! Priority Code A-MWD6
**Keynote Address**
Tuesday, January 8
8:45 am – 10:15 am

Start off your week by hearing groundbreaking and news-making presentations first-hand from Apple executives, industry leaders and alliances. The Macworld Conference & Expo Keynote has a long-standing tradition of delivering high-powered executives that set the pace for the future of the Mac OS platform. The Keynote sets a tone of excitement and enlightenment that will stay with you throughout your week at Macworld Conference & Expo as you uncover what’s new, what’s next and what’s hot for the Macintosh community.

**Feature Presentation**
Wednesday, January 9
9:30 am – 10:30 am

This ain’t your parents’ Mac: The Present and Future of the Mac Platform
Rick LePage, Editor-in-Chief, Macworld

Come hear what industry pundits think about the direction of the Mac platform. Apple offers an incredible range of products that incorporate innovative and functional design with incredible applications, superfast processors and, of course, Mac OS X. What does this all mean for the future of the Mac? In this panel discussion, learn why the Mac platform will continue to drive innovation and remain the platform of choice for creative professionals, web professionals, educators, consumers, techies and more.

*Keynote and Feature Presentation are open to Platinum Pass, Super Pass, Pro Conference, Expo Conference, Power Tools Conference and Workshop attendees ONLY. Seating is on a first-come, first-serve basis.*

**Special Interest Boulevard**
After its debut last winter, the Special Interest Boulevard returns to San Francisco featuring 100 of the coolest Mac developers, all boasting products that span a wide array of needs and interests.

As you walk along the Special Interest Boulevard at Macworld Conference & Expo/San Francisco 2002, you will find Mac developers who specialize in the following types of products and solutions:

- Digital Media
- Small Business
- Sci-Tech
- Education/Assistive Technology

www.macworldexpo.com • For information, call toll free 1-800-645-EXPO
The Macworld/Power Tools Conferences were designed in response to your request for more in-depth training on specific applications. Combine Macworld/Power Tools with a Macworld/Pro or Macworld/Users conference and you will achieve the ultimate training experience! This is an opportunity for dynamic training on all levels at the most comprehensive Mac event!

PA The Macworld Conference on Professional Photoshop
Photoshop is the “killer app” that changed the lives of thousands of graphics and creative professionals. Macworld Conference & Expo is pleased to present an advanced conference on Photoshop presented by a faculty of experts that will unlock this amazing tool’s secrets, inspiring you to take your projects in new directions. Attend this conference to improve your skills, broaden your digital imaging bag of tricks, and open new horizons as you spend two intensive days with Photoshop masters.

Monday, January 7
9:30 am - 5:30 pm
Opening Remarks: The History of Photoshop
Digital Imaging Essentials
Layer Secrets
The Power of Vector Shapes & Styles
Real World Masking & Compositing
Professional Retouching Techniques

Tuesday, January 8
10:45 am - 6:45 pm
All About Type
Special Effects
Color Management — In Plain English Please
Taking It to the Web
Actions & Droplets: Photoshop for Lazy People

PB The Macworld Conference on FileMaker Pro
FileMaker is the most popular database for the Macintosh because it is so easy to use. In the past seven years, the capabilities in FileMaker have been increased significantly. FileMaker has a robust scripting and calculation language, web enablement technologies and support for emerging technologies like JDBC, Java, XML, and Citrix. These areas and more will be covered in the Professional FileMaker Conference at an intermediate to advanced level.

Monday, January 7
9:30 am - 4:45 pm
Opening Remarks: The Future of FileMaker
Relational Database Design
Intermediate Scripting and Calculations
Emerging Technologies
FileMaker and the Web

Tuesday, January 8
10:45 am - 6:45 pm
Advanced Scripting and Calculations
The Power of Plug-ins
So You Want to be a Developer
Security
FileMaker as a Business Tool

PC The Macworld Conference on Final Cut Pro
Final Cut Pro is the video creation software that has finally delivered on the promise of the DV evolution. With power, speed and features worthy of far more expensive software, Final Cut Pro offers a true high end editing environment at a very down-to-earth price point.

Join Josh Mellicker and Steve Martin from DVcreators.net, the world’s two top Final Cut Pro gurus, for a two-day seminar that will empower you to navigate Final Cut Pro’s treacherous learning curve with ease and clarity.

Whether you’ll be creating corporate training videos, feature films, educational videos, marketing CD-ROMs, documentaries or web video shorts, this seminar will reveal a vast landscape of possibilities with this powerful video creation tool.

Monday, January 7
9:30 am - 5:30 pm
Opening Remarks: The History of Final Cut Pro
Building the Ultimate Desktop Movie Studio
Editing Essentials
Basic Time Techniques - Art and Function
Transitions, Filters and Keyframing
Compositing and Motion Graphics
Audio Post Production

Tuesday, January 8
10:45 am - 6:45 pm
Editing Aesthetics and Storytelling
Tricks, Tips and Timesavers: PowerUser Session
Software Integration
Hollywood Special Effects
Final Mastering and Output

Workshops
Begin the week with one of our information packed full-day workshops that provide in-depth training on key products and technologies. You can find full workshop descriptions at www.macworldexpo.com.

Tuesday, January 8
12:00 pm - 7:00 pm
WA JavaScript Bootcamp
WB DV Revolution Workshop - Digital Video Production from Concept to Completion
WC Practical Introduction to Mac Networking
WD Getting Started in Interactive Development
WE PDF Secrets for Print or Web
WF Dr. Mac’s “Getting Comfortable with Mac OS X” Workshop
WG The Total Communications Solution: Integrating Voice, Data, and Applications
WH QuickTime Streaming Workshop
WI Mac Efficiency and Power User Tips
WJ Integrating Professional Publishing Tools
WK Getting Started with AppleScript
WL Mac OS X In-Depth
Macworld/Pro Conference Program

January 9-11, 2002

The Macworld/Pro Conference agenda presents topics of interest to the computing professional who relies on the Macintosh as his/her platform of choice. We have a new conference agenda that offers the most sophisticated training available on Mac networking, digital video (with an emphasis on QuickTime), professional publishing, Mac systems administration for large organizations, and detailed technical presentations that take you inside Mac OS X.

Track Descriptions:

**Macintosh Networking & Communications**
This track presents techniques and technologies associated with deploying Macintosh LANs, WANs, and Internet/intranet access. These technical presentations take you inside the protocols and services you encounter when deploying connected Macintoshes. Get the most of your network or make it state of the art — these tactical sessions will show you how.

*Sessions include:*
- Mac Networking Update
- On the Trail of Network Problems
- Macintosh Network Security in a Changing World
- Advanced AirPort Networking
- The Art of Self-Defense on the Web
- Securing Your Internet Connection — Updated for Mac OS X
- Network Q & A — Ask the Experts

**Digital Video and Filmmaking**
The Mac is a mainstream tool in the digital filmmaking arena. Apple technology provides best of class tools to produce and deliver the highest quality content. Attend sessions in this track to hear from industry experts and top practitioners on how to use these tools to create quality material and delivery experiences for your customers. This track mixes practical tools advice with brilliant industry perspectives to deliver a composite picture of creating and distributing successful digital video projects.

*Sessions include:*
- AFI Presents: Digital Filmmaking at the Crossroads
- Digital Filmmaking Visualization and Preproduction
- Digital Filmmaking Distribution: Web Streaming, HD Digital Cinema and Beyond
- QuickTime Streaming Secrets
- DVD Now Means: Digital Visionary Device
- QuickTime on the Web
- Guerrilla Marketing for Independent Filmmakers
- Authoring and Delivering Interactive Video

**Professional Publishing**
Hear from industry experts how to be more profitable, efficient, competitive and employable in the creative arena. You'll gain knowledge that will help you run a leaner, meaner and more productive creative group. These sessions will show you how to improve your bottom line.

*Sessions include:*
- Mac OS X: Networked Workflows for Publishing
- Mac OS X and PDF — The REAL Story
- ColorSync Workflow Demonstration and Theory
- Real World ColorSync
- Introduction to AppleScript for Creative Workflows
- Web Development in Mac OS X: The Ultimate Web Publishing Platform

**Mac OS X In-Depth**
This track of advanced sessions takes you under the hood of Mac OS X — the new operating system for the Macintosh. You'll learn about Mac OS X's Unix heritage and why this is important for advanced usage and management mastery. Also covered are sessions on how popular add-on technologies like AppleScript and Java are affected by OS X. You'll hear about housekeeping issues in OS X such as backup and font management. Advanced topics on the advanced operating system — Mac OS X. Only available at Macworld/Pro.

*Sessions include:*
- NetInfo for System Administrators
- Mac OS X Sysadmin Concepts
- Taking Control of Mac OS X
- Mac OS X Server: In-Depth
- Backup, Archiving and File Transfers for Mac OS X
- Using Unix Software with Mac OS X
- Mac OS X Security Features and Fundamentals
- It's a Darwin World: Mac OS X and Open Source

**Mac Manager**
The Mac continues to be a platform in transition. Organizations that depend on the Mac OS now are facing new software and hardware options that require a considerable amount of strategic planning to ensure successful deployment. This track features sessions that look at the needs of organizations using the Mac and present the methods, practices and technologies that are defining the role of the Macintosh manager.

*Sessions include:*
- Ask Questions First, Reinstall Later: Hardcore Theory-Based Troubleshooting for Veteran MacTechs
- Using Java on the Mac
- Taking Over Your Company's Macs: Becoming "Mac IS" for Companies without Mac Support
- Building and Maintaining a Macintosh Datacenter

**Travel & Venue**

ETMI (Event Travel Management, Inc.)

ETMI is once again the official travel company for the Macworld Conference & Expo/San Francisco 2002, taking place January 7 – 11, 2001 in San Francisco, CA.

**Hotel Reservation Instructions**
To Make Hotel Reservations for Macworld Conference & Expo/San Francisco 2002:
- Book on-line using www.macworldexpo.com and receive immediate hotel confirmations!
- Call toll free at 1-866-254-1103 in the US or 1-312-396-2127 outside the US, Monday – Friday from 9:00 am – 7:00 pm EST.

For exciting updates of additional hotels and the lowest negotiated rates, please check the Travel page on the Macworld Conference & Expo Web site at www.macworldexpo.com.

**Airline Reservation Instructions**
Don't forget to book your airline tickets. ETMI makes it convenient by booking Hotel reduced rates and airline discounted fares with just one phone call.
- Contact ETMI by email at AirEvent-travel.com. We can book your reservations for you on any airline as well as offer exclusive discounts for Macworld Conference & Expo/San Francisco 2002 registrants on American Airlines and US Airways.
- For your convenience, you may also call the airlines directly as noted below. Please make sure to mention the tour code to take advantage of these low fares.

**American Airlines**
800-433-1790
Tour Code: A0112BA

**US Airways**
877-874-7687
Tour Code: 96192163

Register Today & Save! Priority Code A-MWD6

www.macworldexpo.com • For information, call toll free 1-800-645-EXPO
Macworld/Users Conference Program

January 9-11, 2002

The Macworld/Users Conference continues to be one of the best educational values anywhere offering over 70 conference sessions on a variety of exciting topics all presented by industry experts. Get your first taste of Mac OS X, learn all about making Desktop Movies, Digital Photography and get tips on using your favorite applications. We've also got special tracks of sessions for Creative Professionals, Educators, and Small Business owners. We've added new sessions on how your Mac can act as a Digital Hub to connect many of your favorite personal electronic devices.

Wednesday, January 8

S01 Making the Transition to Mac OS X
S02 Crashed Again! How the Pros Troubleshoot Macintosh
S03 Your Mac as a Digital Hub
S04 Selecting the Right Tools for Your Small Business
S05 Getting Started with Home Movie Making
S06 Photoshop Digital Creation: Uncanny Realism
S07 FileMaker Pro Supersession
S08 High-performance Computing for the Sciences on the Macintosh
S11 Using the Classic Environment in Mac OS X
S12 "Macintosh Bible" Roundtable
S13 Wireless Networking Essentials
S14 iTunes Rocks — I Want My MP3
S16 Making iMovies with David Pogue
S17 Mac OS X for Musicians
S18 Introduction to 3D Animation
S19 Science Education
S22 The Care and Feeding of Hard Disks
S24 Mac OS X and the Digital Lifestyle
S25 Making a Life While Making a Living as Independent Professionals, Consultants and Entrepreneurs
S26 Editing Techniques for iMovie 2
S27 It's the Fonts
S28 Microsoft Office 10 Inside and Out
S29 Macs in the Law Office

Thursday, January 10

S31 One User, Two User...Red Mac, Blue Mac
S33 Internet Security for the Rest of Us
S35 Wireless Networking for Small Business
S36 Shooting Great DV
S37 Photoshop: Ho-hum to Wow! in 60 Seconds
S38 From 0 to 360 Degrees in QuickTime VR
S39 Return on Investment: Can Your Community Pay the Bills?
S41 Troubleshooting Mac OS X
S42 PalmPilot & Macintosh — A Match Synched in Heaven
S43 Creating Wireless Computer Labs
S45 Small Business Management Made Easy — With an All-Mac Business Management System
S46 Cool QuickTime Tools
S47 Digital Photography Studio Essentials for Professional Photographers
S48 Sunlight at the Page Layout Corral
S49 Why Should You Care About MPEG-4
S50 Education Has Moved Online
S55 How to Digitally Archive Your Family History
S55 The Total Communications Solution: Integrating Voice, Data, and Applications
S57 Recipes for Success with Adobe Photoshop Elements
S58 Just Flash It

Friday, January 11

S61 Troubleshooting Classic in Mac OS X
S62 Best of Mac Secrets
S63 Transitioning to Mac OS X in Higher Education
S64 A Mac User's Survival Guide to Working with Windows Clients
S66 Getting the Most Out of iMovie: Tips and Tricks for Advanced Movie Making
S67 Messages/Narrow Pipe
S68 Xtending QuarkXPress with Xtensions
S71 Backing Up Under Mac OS X
S75 Selecting the Right Macs for Your Small Business

Register Today & Save!

Priority Code A-MWD6

www.macworldexpo.com • For information, call toll free 1-800-645-EXPO

Conference Packages

BRAND NEW! Platinum Pass
2 Days of Macworld/Power Tools Conference Sessions, 3 Days of Macworld/Pro Conference Sessions, 3 Days of Macworld/Users Conference Sessions, Lunch (Jan. 7-11), Keynote, Feature Presentation, MacBeginnings, Birds of a Feather Meetings, and Exhibit Floor (Jan. 8-11)
Register for a Platinum Pass and get the 5th FREE!

Super Pass
Workshop (Jan. 8), 3 Days of Macworld/Pro Conference Sessions, 3 Days of Macworld/Users Conference Sessions, Lunch (Jan. 8-11), Keynote, Feature Presentation, MacBeginnings, Birds of a Feather Meetings, and Exhibit Floor (Jan. 8-11)
Register for 4 Super Passes and get the 5th FREE!

BRAND NEW! Macworld/Pro Conference — 3 Days
3 Days of Macworld/Pro Conference Sessions, Lunch (Jan. 9-11), Keynote, Feature Presentation, MacBeginnings, Birds of a Feather Meetings, and Exhibit Floor (Jan. 8-11)

BRAND NEW! Macworld/Power Tools Conference
2 Days of Macworld/Power Tools Conference Sessions, Lunch (Jan. 7-8), Keynote, Feature Presentation, MacBeginnings, Birds of a Feather Meetings, and Exhibit Floor (Jan. 8-11)

Workshop
Workshop (Jan. 8), Lunch on Workshop Day (Jan. 8), Keynote, Feature Presentation, MacBeginnings, Birds of a Feather Meetings, and Exhibit Floor (Jan. 8-11)

Macworld/Users Conference — 3 Days
3 Days of Macworld/Users Conference Sessions, Keynote, Feature Presentation, MacBeginnings, Birds of a Feather Meetings, and Exhibit Floor (Jan. 8-11)

Exhibits Only Package
MacBeginnings, Birds of a Feather Meetings, and Exhibit Floor (Jan. 8-11) (Does NOT include access to Keynote or Feature Presentations)
NEW Power Mac G4!
Up to 512MB FREE!
733MHz, Dual 800MHz and 867MHz!

Apple delivers two powerful systems with a PPC™ G4 processor, DVD capabilities and easy expandability in either a portable or desktop version. And with MacMall’s incredible prices and service you’ll find purchasing one of these two exceptional systems easy and enjoyable!

The Power Mac G4 puts tremendous creative resources at your fingertips with the revolutionary SuperDrive (DVD-R/CD-RW) and award-winning digital video editing and DVD authoring software. You can choose from three models: the dual 800MHz or 867MHz model with a SuperDrive or the 733MHz model with a CD-RW.

Power Macintosh™—redefining computing speed!
- Up to 867MHz PPC G4 processor; or dual 800MHz PPC G4 processors
- Up to 256MB of PC133 SDRAM
- Up to 80GB HD & up to 7200RPM
- CD-RW drive or SuperDrive (DVD-R/CD-RW drive) • 56K modem
- Three 3.5" expansion bays with support for up to 232GB of storage
- NVIDIA GeForce2 MX graphics card with 32MB SDRAM or TwinView with 64MB SDRAM for dual display support (800MHz model)
- Standard headphone jack
- Multiple audio output capabilities
- Two FireWire ports • Two USB ports
- AirPort™ Card slot • 10/100/1000BT
- iMovie 2, QuickTime, iTunes, iDVD (requires SuperDrive), FAXstf and more!

Astonishing processing power!
Apple has once again managed to do the near impossible, improve upon perfection with the introduction of its new, faster PowerBook G4.

The PowerBook G4 is a full-featured system with everything you need to do your best work on the move such as a PowerPC G4 processor, up to 30GB of hard drive space and an AirPort card pre-installed on the 667MHz models.

Revolutionary design!
- 1 inch thin and only 5.3lbs.
- Durable titanium casing
- Slot loading DVD-ROM drive for playback of DVD-Video, DVD-ROM, DVD-RAM and CD-ROM

Supercomputer performance!
- Up to 500MHz PPC™ G4 processor with Velocity Engine™
- Up to 5 hours of run time
- 128MB or 256MB of PC100 SDRAM
- Easy expandability through FireWire™, USB and PC Card slot
- Built-in 2D/3D graphics acceleration with integrated ATI RAGE Mobility 128 video controller w/AGP 2X
- Built-in 10/100BASE-T Ethernet

PowerBook Accessories
#959645 PowerBook G4 Additional AC Adapter $69
#956072 PowerBook G4 Additional Battery $129
#953968 Apple Pro Keyboard $59
#953969 Apple Pro Mouse $59

"My new Power Mac G4 is so blazing fast, I’ve doubled my productivity and reduced my frustration in Photoshop!"
—Janine Ahuja, Art Director

Apple Power Mac G4 starting at
$1,694!

We’ll beat any price or competitive promotion on any Mac computer • Free
Light. Speed. The New 667MHz Titanium PowerBook G4!

AirPort-ready: The PowerBook G4 is ready for wireless networking with two built-in antennas. The 667MHz model has an Apple AirPort card pre-installed!

Full-size keys: Built-in keyboard includes 12 function keys and 4 arrow keys.

Built-in Gigabit Ethernet: Features built-in Gigabit Ethernet (10/100/1000 BASE-T) for quick access to a corporate network, DSL modem or cable modem.

Power, performance and speed: Includes a PowerPC G4 processor, room for up to 1GB of RAM and up to 30GB of hard disk space—all beautifully designed into a titanium case. The entire PowerBook only measures 13.5 x 9.5 x 1 inches and weighs just 5.3 pounds!

5 hour Battery & Radeon Graphics: Includes a 55-watt-hour lithium-ion battery that provides 5 hours of battery life and the ATI Mobility RadeOn with unparalleled 2D, 3D and multimedia graphics performance!

Wireless Networking:
- Apple Dport BaseStation
  - 11Mb per second
  - Up to 10 users
  - 150' range

Adobe Web Collection 3.0:
- Adobe GoLive 5.0
- Adobe Photoshop 6.0
- Adobe Illustrator 9.0
- Adobe LiveMotion

Coolpix 990 Digital Camera:
- 3.34 Megapixels
- 3X optical & 4X digital zooms

PowerBook Series

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For your best price call 1-800-217-9492 macmall.com

Priority Code: ZMWD1C3
Total Editing Solutions for Digital Video Professionals!

Turnkey systems featuring today's hottest DV products!

Power Mac G4 733MHz Final Cut Pro Editing System
- A digital video editing bundle containing all the tools you need to create stunning video masterworks!
- Power Mac G4 733MHz with a total of 640MB RAM, 40GB HD and CD-RW
- 60GB Videoraid 2/60 SCSI APD 39160 Storage Controller
- Matrox RTMac
- Final Cut Pro 2.0
- SmartSound SonicFire Pro
- Boris Graffiti
- La Cie electron19Blue III 19" Monitor with Hood
- Sony SSM14NSU 14" Color Monitor
- Contour Shuttle Pro Multimedia Jog/Shuttle Controller
- Harman/Kardon SoundSticks Speakers

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- For even more digital video editing power, get the speed of dual processing, more memory and more storage!
- Power Mac G4 800MHz DP with a total of 768MB RAM, 80GB HD and CD-RW
- 60GB Videoraid 2/60 SCSI APD 39160 Storage Controller
- Matrox RTMac
- Final Cut Pro 2.0
- SmartSound SonicFire Pro
- Boris Graffiti
- La Cie electron19Blue III 19" Monitor with Hood
- Sony SSM14NSU 14" Color Monitor
- Contour Shuttle Pro Multimedia Jog/Shuttle Controller
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- Never before has so much digital video firepower been concentrated in such a convenient place. Get everything you need to create and edit video, develop rich multimedia Web sites or serve up thousands of concurrent video streams in one package!
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- Boris Graffiti
- La Cie electron19Blue III 19" Monitor with Hood
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- Power Mac G4 867MHz with a total of 640MB RAM, 60GB HD and SuperDrive
- 60GB Videoraid 2/60 SCSI APD 39160 Storage Controller
- Matrox RTMac
- DVD Studio Pro
- Final Cut Pro 2.0
- SmartSound SonicFire Pro
- 60GB Videoraid 2/60 SCSI APD 39160 Storage Controller
- Adobe Premiere 6.0
- La Cie electron19Blue III 19" Monitor with Hood
- Sony SSM14NSU 14" Color Monitor
- Sony DVMC-DA2 Digital Video to VHS Converter
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Pro Video to Go!
Includes 500MHz Titanium PowerBook G4 with 512MB SDRAM and 20GB Ultra ATA Drive PLUS Final Cut Pro 2, Boris Graffiti, SonicFire Studio, Sony GV-D900 VTR, La Cie 48GB PocketDrive and Contour ShuttlePro Multimedia Jog Controller
all this for only $7,494! #961707

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Power Mac G4 867MHz
CineWave SD Analog System
- Power Mac G4 867MHz with a total of 640MB RAM, 60GB HD and CD-RW
- CineWave Base System
- CineWave Pro Analog Option
- MaxArray LVD 72GB Ultra SCSI Dual Bus • APD 39160 Storage Controller
- Ecrix Tape Back Up System
- Final Cut Pro 2.0 • Cleaner 5.0
- SmartSound SonicFire Pro
- La Cie electron22Blue II 22" Monitor with Hood
- Sony SSDM14NSU 14" Color Monitor
- Contour Shuttle Pro Multimedia Jog/Shutdown Controller
- Harman/Kardon SoundSticks Speakers
all this for only $19,094! #963179

#963180 Power Mac G4 800MHz Dual Processor
CineWave SD Analog System $20,094
Includes the Power Mac G4 800MHz Dual Processor with a total of 768MB RAM, 80GB hard drive and CD-RW plus all of the other additional features listed above!

Power Mac G4 867MHz
CineWave SD Digital System
- Power Mac G4 867MHz with a total of 640MB RAM, 60GB HD & CD-RW
- CineWave Base System
- CineWave Pro Analog Option
- MaxArray LVD 72GB Ultra SCSI Dual Bus • APD 39160 Storage Controller
- Ecrix Tape Back Up System
- Final Cut Pro 2.0 • Cleaner 5.0
- SmartSound SonicFire Pro
- La Cie electron22Blue II 22" Monitor with Hood
- Sony SSDM14NSU 14" Color Monitor
- Contour Shuttle Pro Multimedia Jog/Shutdown Controller
- Harman/Kardon SoundSticks Speakers
all this for only $20,083! #963181

#963182 Power Mac G4 800MHz Dual Processor
CineWave SD Digital System $21,083
Includes the Power Mac G4 800MHz Dual Processor with a total of 768MB RAM, 80GB hard drive and CD-RW plus all of the other additional features listed above!

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Apple iBook G3
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the iBook weighs just 4.9lbs. and
is only 11.2 inches wide, 9.1 inches deep and a mere 1.35 inches thick!
Choose your new iBook with
a CD-ROM, DVD-ROM, CD-RW or
a Combo drive which combines the capabilities of CD-RW & DVD playback.

iBook features include:
- 500MHz PPC G3 processor
- 256K on-chip L2 cache
- 64MB or 128MB of PC100 SDRAM; one available slot for up to 640MB
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- ATI RAGE Mobility 128 graphics controller with 8MB SDRAM
- 10GB hard drive • 56K modem
- 10/100BT ready for DSL/cable modem

Apple’s new iMac—the flexible center of your digital world!
New iMac models come fully loaded with the most advanced features—speeds up to 700MHz, an engaging new interface, a CD-RW or 24X CD-ROM drive and tons of software. You can easily perform processor-intensive tasks as well as any digital projects like burning CDs or making desktop movies!

iMac features include:
- Up to 700MHz G3 PowerPC processor
- 256K L2 cache • Up to 40GB HD
- Up to 266MHz P4 processor; up to 1GB
- 24X CD-RW or 24X CD-ROM drive
- ATI RAGE 128 Ultra w/16MB SDRAM
- 15” display • 56K V.90 modem
- 10/100BT Ethernet • Airport ready
- 2 FireWire and 2 USB ports
- Standard VGA output (15-pin mini D-Sub); support for video mirroring
- 30 days free EarthLink Internet service
- Software includes: Mac OS X, AppleWorks 6, iTunes, QuickTime 4, iMovie 2, Palm Desktop, Bugdom, Nanosaur, Cro-Mag Rally, QuickTime Deluxe 2001, FAXstf, Netscape Communicator, Microsoft Outlook Express, Microsoft Internet Explorer

iMac Accessories
#57369 Apple AirPort Card $99
#57373 Apple AirPort Base Station $299
#959646 Additional iMac Rchrgble. Battery $129
#959645 Additional iBook AC Adapter $69
#959647 iBook AV Cable $19

My compact and light iBook is so flexible and versatile that I can go anywhere, easily get online and always stay in touch with my work!

—Raja Itani, Sr. Accounts Payable Supervisor

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FREE HP 315xi Digital Camera or $150 Cash Back* with purchase of a 600MHz or 700MHz iMac!
*Via mfr. mail-in rebate coupon. Offer ends 12/31/01.

Apple Mac OS X comes pre-installed on every iMac:
Mac OS X gives you more ways to personalize your system by making it easier to send and receive e-mail and to access applications, files, external devices, networks and the Internet.

FREE RAM with every iMac computer purchase:
MacMall is offering up to 256MB of free RAM with an iMac purchase. A $30 professional installation fee is required. Offer ends 12/31/01.

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Built for Mac OS X!
Enjoy six applications in one:
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- Save your work as HTML

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The best way to share documents!
- Create documents anyone can open

Adobe Photoshop 6.0
Combine vector drawing tools and layer design features
- greatly enhances all of your creative options!

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The leading layout and design software for publishers worldwide!
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Optimize performance and solve your hard disk problems!
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Fireworks 4 Studio
Create, edit & animate bitmap and vector Web graphics and add advanced interactivity & pop-ups.

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The most advanced OS!
This groundbreaking operating system delivers the performance and stability needed for 21st Century computing. And Mac OS X v.10.1 unleashes the full potential of your Mac with dozens of new features!
- Designed to run on:
  - iMac, iBook, Power Mac G3/G4, Cube and PowerBook

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**HP DeskJet 9600Cse Printer**
- Resolutions up to 2400 x 1200dpi
- 15ppm black; 12ppm color
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**Stylus® Color 777 Printer**
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- 8ppm black; 7ppm color
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**Apple 15" Flat Panel Display**
- Active-matrix LCD
- 1024 x 768 max. res.
- only $599

**LaCie 16x10x40 External SCSI CD-RW Drive**
- Only $5319

**New! CM615 17" Display**
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Delivers real-time power & creative freedom to your Power Mac G4!
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- 8.5" x 11.7" scan area
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**Apple 15" Display**
- Active-matrix LCD
- 1024 x 768 max. res.
- only $599

**LaCie 16x10x40 External SCSI CD-RW Drive**
- Only $5319

**Astra 3400 Scanner**
- 600 x 1200dpi
- 42-bit color
- 8.5" x 11.7" scan area
- only $69

**Price reflects $20 MacMall rebate. Price before rebate $269.99. Offer expires 11/30/01. System req.: PPG 120MHz or better, 128MB RAM, 160MB HD Apple Mac OS X v.10.1 or better. #208615 Microsoft Office v.X (Full) 543799**

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**For your best price call 1-800-217-9492 macmall.com**

**Priority Code: ZMWD1C3**
New Quicksilver G4 – faster than ever

Apple® Power Mac™ G4

With the entry-level Quicksilver Power Mac G4 performing as fast as a Pentium® with twice the clock speed, the new Power Mac G4 line trounces the Pentium® 4 and proves the Megahertz Myth is just that.

**G4 Processor**

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**Apple Studio 17 Display 17” Diagonal Flat-Panel**

WAS $1799.98

NOW $999.98

**Quicksilver G4**

Starting At Only $1694.98

**Power-packed at a lower price**

Apple® Titanium PowerBook™ G4

At 5.1 lbs. and 1” thin, the sleek-yet-powerful PowerBook G4 moves; up to 300-400 MHz faster than the UltraPortables. Starting at $2799.98

**NEW PowerBook G4**

Up to 667MHz starting at $2194.98

**NEW iBook G3**

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Ti74on4 Book 4 $299.98

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Up to 512MB Memory!

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* A $50 professional installation fee applies to all FREE memory promotions. It may take up to one business day to process the installation. Offer good while supplies last. Restrictions may apply.

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**108 December 2001**
New iMacs with CD burners built in

Apple® iMac™

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Processor

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iMovie 2

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AppleCare Protection Plan

iMac #722602 $149.99

IN STOCK!

Beautiful, brainy digital companion

Apple® iBook™

Taking size-slimming style cues from the Titanium PowerBook G4, the iBook's eye-catching total redesign goes beyond its good looks. At only 4.9 pounds and measuring just 1.3" thin, it's small enough, rugged enough and powerful enough to fit any mobile lifestyle. And now you also get a 500MHz G3 processor and your choice of optical drives — a CD-ROM drive, DVD-ROM or combo CD-RW/DVD-ROM drive.

G3 Processor

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ONLY

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<td>APS HyperDAT® IV (DDS-4) LVD SCSI</td>
<td>999.95</td>
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APS AIT Tape Backup

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<thead>
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<th>Model</th>
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<tr>
<td>APS AIT+ FireWire</td>
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<td>APS AIT II LVD SCSI</td>
<td>3,099.95</td>
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<table>
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<th>Model</th>
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<tr>
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<td>LaCie 40GB PocketDrive</td>
<td>$419.95</td>
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LaCie monitors

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<thead>
<tr>
<th>Model</th>
<th>Dimension</th>
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LaCie Ultra160 LVD SCSI Drives

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<th>Model</th>
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<tr>
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<td>APS ST 73GB Ultra160 LVD</td>
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<td>APS ST 180GB Ultra160 LVD</td>
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Drives listed above carry a five-year warranty, except those marked.

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<td>7200</td>
<td>$199.95 $249.95</td>
</tr>
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</table>

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<tr>
<th>Model</th>
<th>RPM</th>
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<tr>
<th>Apple iBook™</th>
<th></th>
<th>500MHz PowerPC G3 processor</th>
<th>Memory: 128MB SDRAM</th>
<th>15GB hard drive</th>
<th>24X Max CD-ROM drive</th>
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<th>Mac OS X 10.1</th>
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<td>Mac OS X 10.1</td>
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<td>56Kbps modem and 10/100 Ethernet</td>
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<td>+ 128MB FREE</td>
<td>20GB hard drive</td>
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<td>Memory: 256MB SDRAM + 256MB FREE</td>
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<td>Mac OS X 10.1</td>
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<td>+ 6X DVD-ROM drive</td>
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<td>Mac OS X 10.1</td>
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<td></td>
<td></td>
<td>+ 20GB hard drive and combo</td>
<td>20GB hard drive</td>
<td>6X DVD-ROM drive</td>
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<td>Mac OS X 10.1</td>
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---

**Features:**
- 1 Firewire Port
- 2 USB Ports
- Airport ready
- 56K Modem
- Built in 10/100Base-t

<table>
<thead>
<tr>
<th>Part#</th>
<th>Mhz</th>
<th>Optical Drive</th>
<th>Base Ram</th>
<th>HD</th>
<th>Price</th>
<th>Or as Low As</th>
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<tr>
<td>A102 2088</td>
<td>500Mhz G3</td>
<td>24x CD-ROM</td>
<td>128MB</td>
<td>15GB</td>
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<td>A102 2089</td>
<td>600Mhz G3</td>
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<td>A102 2090</td>
<td>600Mhz G3</td>
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<td>128MB</td>
<td>20GB</td>
<td>$1695</td>
<td>$41/MB</td>
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<th>Description</th>
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<tr>
<td>PowerMac G4 666MHz/733</td>
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**Features:**
- Firewire Port
- OS 10.1 and 9.2
- 56K Modem
- Built in 10/100Base-t

<table>
<thead>
<tr>
<th>Part#</th>
<th>Mhz</th>
<th>Optical Drive</th>
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<td>A102 2086</td>
<td>550Mhz G4</td>
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<td>512MB</td>
<td>30GB</td>
<td>$1695</td>
<td>$41/MB</td>
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**Features:**
- 8MB SDRAM 2D/3D
- AGP 2x Video Graphics

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**Features:**
- 42 bit
- 2400 dpi
- FireWire/USB

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**SONY G520 21"**

- Flat Trinitron Display

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the world of the future, it’s all about being agile enough to accept and implement any new standards—particularly networking standards—that come along.

Take Microsoft’s .Net strategy, a scheme for deploying Microsoft-proprietary software modules from servers, across networks, using open protocols. In the absolute worst-case scenario, it would create new standards for establishing identity and conducting secure commerce that relied on Microsoft-licensed software. Bang—Microsoft would have a stranglehold on the Internet.

But there’s already an open-source movement to create a free implementation of .Net technologies for Linux... and since Linux is Darwin’s cousin, an initiative for OS X is right behind that.

Power In Numbers

Before OS X, the world consisted of Windows and a balkanized collection of other operating systems. Now, there’s Windows, and then there’s the open-source community. Would you believe that this community, working together, could totally screw up any chance that Microsoft might have to abuse its .Net leverage? By getting .Net into everyone’s hands, it could transform one company’s power play into a free standard that would benefit everyone and keep all operating systems and bits of beeping plastic on the same operational level.

RSVP to Darwin

I’m convinced that as OS X matures, Unix operations will become something akin to AppleScript: a powerful resource that doesn’t confuse people unless they willingly dive into it, and one that most users never exploit until they see the fabulously slick ways someone else is using it. I’ve been recommending two books published by O’Reilly and Associates: Unix Power Tools and Unix in a Nutshell. Both feature O’Reilly’s usual maximum content for minimum bucks. Of the two, Power Tools is the one you’ll be referring to most often. Nutshell takes a classroom approach, but reading Power Tools is like idly watching an expert go about his business. You won’t retain the entire picture right away, but it’ll fix in your mind what you’re capable of doing with the command line, and your eyes will thus be open to simpler ways of doing things that don’t involve mousing.

So I want you to walk right over to Darwin and introduce yourself. Don’t pretend he isn’t there. OK, yes, maybe he has caused us an inconvenience or two by strewing three-letter file-name extensions like so many empty Miller Lite cans across our pristine, Teletubbies-style landscape. But he’s got a heart of gold. And once you get to know him, you’ll understand why he was invited in the first place. m

When not writing for Macworld, the Chicago Sun-Times, and other publications, columnist ANDY INNATKO (www.andyi.com) has been thrown out of some of the most exclusive parties on society’s A list.
HOW REFRESHING it is to be at a party and on the other side of the snide comment “Good God—who invited him?” We’re at a big party celebrating the success of Mac OS X. And the him is Darwin, the cutely named Unix creature who lives underneath OS X’s Aqua interface—and who’s currently hogging a bowl of Goldfish crackers. Ever since Apple’s new operating system arrived, everyone has been just a bit uneasy about the little guy invited to the Mac party by Steve Jobs.

It’s not Darwin’s fault. Much like a fish-out-of-water partygoer no one knows anything about (except for one woman who’s pretty sure that he plays bass in a Duran Duran cover band), the very presence of this implementation of Unix has caused suspicion, fear, and loathing to spread throughout the OS X celebration.

Social conventions can be cruel. But looks can be deceiving. Even the most questionable invitee can end up being the center of attention, once he opens up and you get to know him. Darwin’s like that. Here’s what he brings to the party:

**Developers** When Apple announced its plan to build its future on an open-source (well, open-source-ish) operating system that would be based on Unix, the number of Mac OS developers instantly increased by one order of magnitude (the exact number quoted varies depending on the people you ask—and on how much glue they’ve been sniffing). This fact alone makes Darwin worth keeping around, even if he does keep pestering the DJ to play something by The Bangles.

Darwin made Mac OS instantly palatable to Unix developers; so far, more than 2,500 open-source apps have been brought to Mac OS via Darwin. Granted, few Mac users are going to see the ability to run the Pine mail client in a Terminal window as a great leap forward, but all the greatest hits of open source are here, including a lot of apps that’ll shore up the Mac’s presence in academic and enterprise computing. Browse through the links on www.macgimp.org—the home of MacGIMP, a next-to-free image editor that offers many of Photoshop’s features at a very un-Photoshop-like price—to get an idea of the larger world that lies just beyond Aqua.

All this may or may not impress you, but the fact remains that the bathroom lines at Apple’s annual World Wide Developers’ Conference just got a lot longer. That’s a bad situation for those developers, but it’s a great one for all who use the products they create.

Unix developers aren’t the only ones who’ll welcome the arrival of Darwin on the desktop: old-school Mac developers are also getting in on the act. Just in the past few months, two longtime Mac apps, FileMaker’s FileMaker Pro Server and 4D’s WebStar, announced new OS X versions that are radically different from their previous Mac incarnations. Both programs are actually Darwin applications, lurking beneath the surface of Aqua and providing huge amounts of serving power. Then both companies wrote very pretty Aqua applications—in Cocoa for FileMaker, and Java for WebStar—for us to use when we’re setting up server preferences.

**Standards** Boy, this is a big deal. The Big Shimmering Evil Green Cloud that once threatened to kill operating systems’ futures was lack of hardware. Later, it was lack of software. But here in
AMAZINGLY ACCURATE COLOR.

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