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Macworld

OS X UPDATE
Apple's First Preview of the New Mac OS X, page 18

eMac
Apple's New G4 Arrives

+ 60 SOFTWARE GEMS
Reviewed: Essential Low-Cost Utilities for OS X and OS 9

Plus | Storage Buying Guide | OS X Font Secrets | New Xserve Server | 700MHz iBook

POWERBOOK POWERHOUSE
Digital Video, Fast Cache Make the New PowerBook G4 Shine

When's the last time anyone

"There is no doubt in my mind this is the best (and best-looking), fastest, most capable iMac of all time, as well as the best iMac value ever. This computer is so fine that even Windows users lust for it."

-Bob Levitus, in The Houston Chronicle

"Apple has yet again provided a Macintosh polish and elegance at prices the Windows world can't match."

-David Pogue, The New York Times

"...the new iMac proves a sequel can be better than the original."

-Matthew Fordahl, The Associated Press

"I've been seduced by a computer. Not just any computer, but the new iMac from Apple, the sleekest computer I've ever seen."

-Mike Wendland, The Detroit Free Press

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felt this way about a PC?

"When you're actually working on the new iMac, with the screen lowered so it sits between your face and the base, it's a thing of pure beauty. You feel as if you're typing onto a gorgeous palette that's floating in the air."

-Walter Mossberg, The Wall Street Journal

"It's the kind of thing you'd expect to see in an *Architectural Digest* photo shoot of Captain Kirk's bed table."

-Steven Levy, Newsweek

"Computer users of the world unite: You have nothing to lose but your eyestrain and stiff necks."

-Stephen Wildstrom, Business Week

"Yes, I love it, it's just too wonderful..."

-David Gelernter, The New York Times

The new iMac.

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Incorporating MacUser

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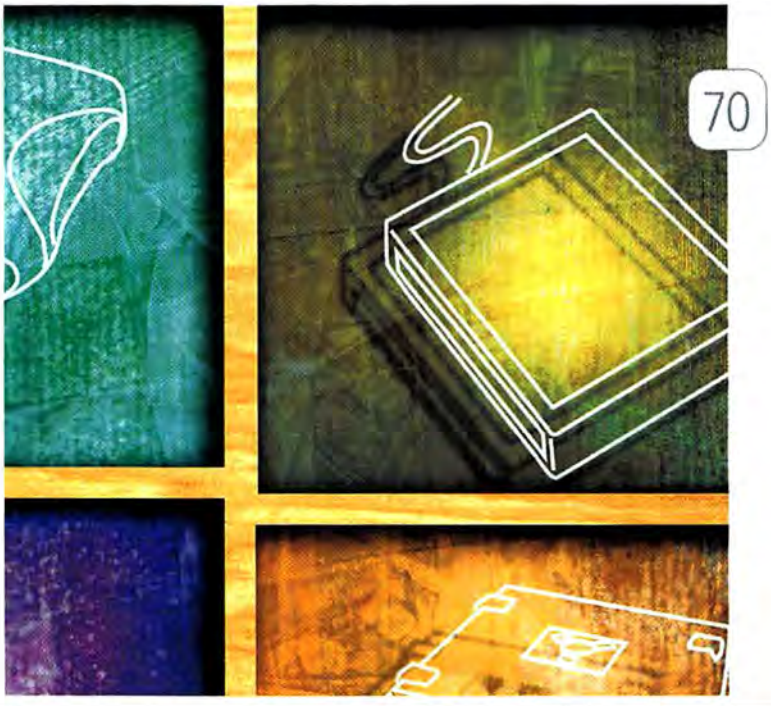

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Enjoy the action of Escape Velocity: Nova and Wipeout 2097, create your own adventure game with the Coldstone Game Engine, and connect your Nintendo G4 game controller to your Mac with the Adaptoid.

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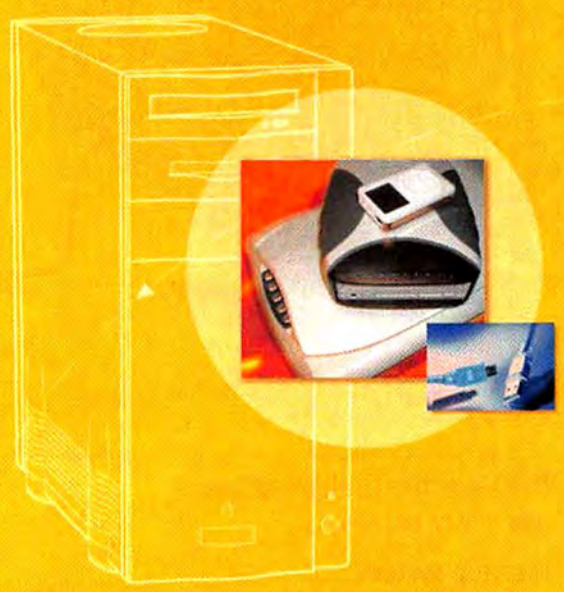

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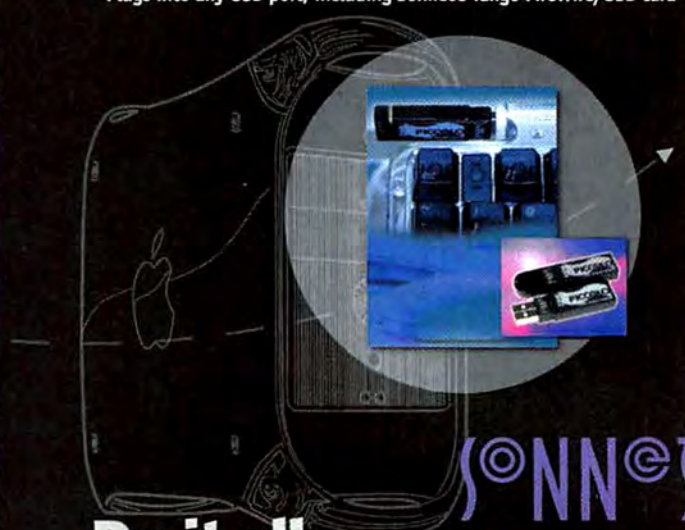

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BY | RICK LEPAGE

Should You Care about Apple's Education-Only eMac?

E Is Not for Everyone

MOST *MACWORLD* READERS WON'T EVEN SEE AN eMAC, let alone be able to buy one (for now, anyway). But this new model is more important, in its own way, than the flat-panel iMac introduced in January.

Just look at the sum of its parts. Some people have already complained that the eMac is what Apple's customers were asking for back in 1999, and there's truth to that. And the eMac certainly doesn't win many style points: it looks like a slightly warmed-over, bulkier, first-generation iMac. But it's the right machine at the right time and the right price for a market that has had an up-and-down relationship with Apple.

We've heard how PC companies (primarily Dell) have made inroads into the lucrative education market over the past few years; even Steve Jobs has admitted that Apple's past efforts in education haven't been stellar. Last year's iBook helped, but portables are only part of the equation. You also need desktops, and as cool as the new iMacs are, their flat panels, thin pivoting necks, smaller screens, and high prices scare off both school computer czars and the folks who control the budgets. They want inexpensive, hardy, powerful machines. The first-generation iMac was inexpensive and hardy, but it's been lacking in the power category for some time.

The eMac is a pretty good effort to give schools power, flexibility, and affordability. It not only has a larger display, a G4 processor—and the now requisite USB and FireWire connectors that are the key to Apple's digital-hub strategy—but also sports an *audio-in jack*, which Apple removed from the Mac product line a while ago without apologies.

Moving beyond the reemergence of audio input (admittedly a minor thing), Apple has made a bunch of even smarter moves with the eMac—for example:

- Announcing it at the right time in the purchasing cycle, so educators can evaluate its capabilities and order machines to be installed before students return in the fall.
- Offering the eMac with either OS 9 or OS X as its default operating system. Administrators have enough problems getting everything they need onto each system; they don't need to deal with reinstalling a whole OS.
- Continuing to offer the original iMac. People aren't talking about this, but the first-generation iMac is still available for $800, and Apple plans to keep the product in its lineup for the near future. This is a much better machine than the junk you can get on the PC side for the same price. However, the price needs to come down a bit more.
- Making the eMac available only to education customers. This has bothered some folks: those who want their own eMac and those who think that making the eMac widely available would help Apple sell more boxes at the cost-conscious end of the market. For now, Apple needs to make sure it can manufacture *and* deliver all the eMacs it can, to the market they were designed for. If this model is successful, Apple will probably look at a version of the eMac for the consumer market. But that's a thornier proposition for another time.

Our passion for the Mac means that we're a lot more critical of Apple than, for example, Windows users are of Microsoft, or gamers are of the companies that make their games. Although we do (rarely) laud Apple when it does cool stuff, we more often kvetch about all the stuff Apple is doing wrong. The eMac is one of those things Apple is doing right, and it's good for all of us.

Now, where are those new Power Macs for professional users?

Shareware

I'm really excited about one of this month's features: reviews of 60 shareware, low-cost, and free applications and utilities for the Mac. Working with a group of writers and editors, Associate Editor Jonathan Seff pulled together a collection of the best software for the lowest prices. Whether you're running OS 9 or OS X, there are great things nestled in those pages, a few of which rival pricier applications from the big guys.

> Apple has made a lot of smart moves with the eMac.

The Macintosh ecosystem couldn't exist if the only programs we could buy were commercial applications such as Adobe Photoshop, Apple's Final Cut Pro, FileMaker Pro, and others. Those programs are extremely important, but there are also plenty of tools that make their own valuable contributions—for a fraction of the price. Hopefully, this story will give you some idea of the scope of what's available; look for more of the same in the coming months. □

Let me know what you think—good or bad—about *Macworld* or anything else related to the Mac. You can drop me an e-mail, at rick_lepage@macworld.com, or join the discussions in our forums, at www.macworld.com. I'd love to hear from you.

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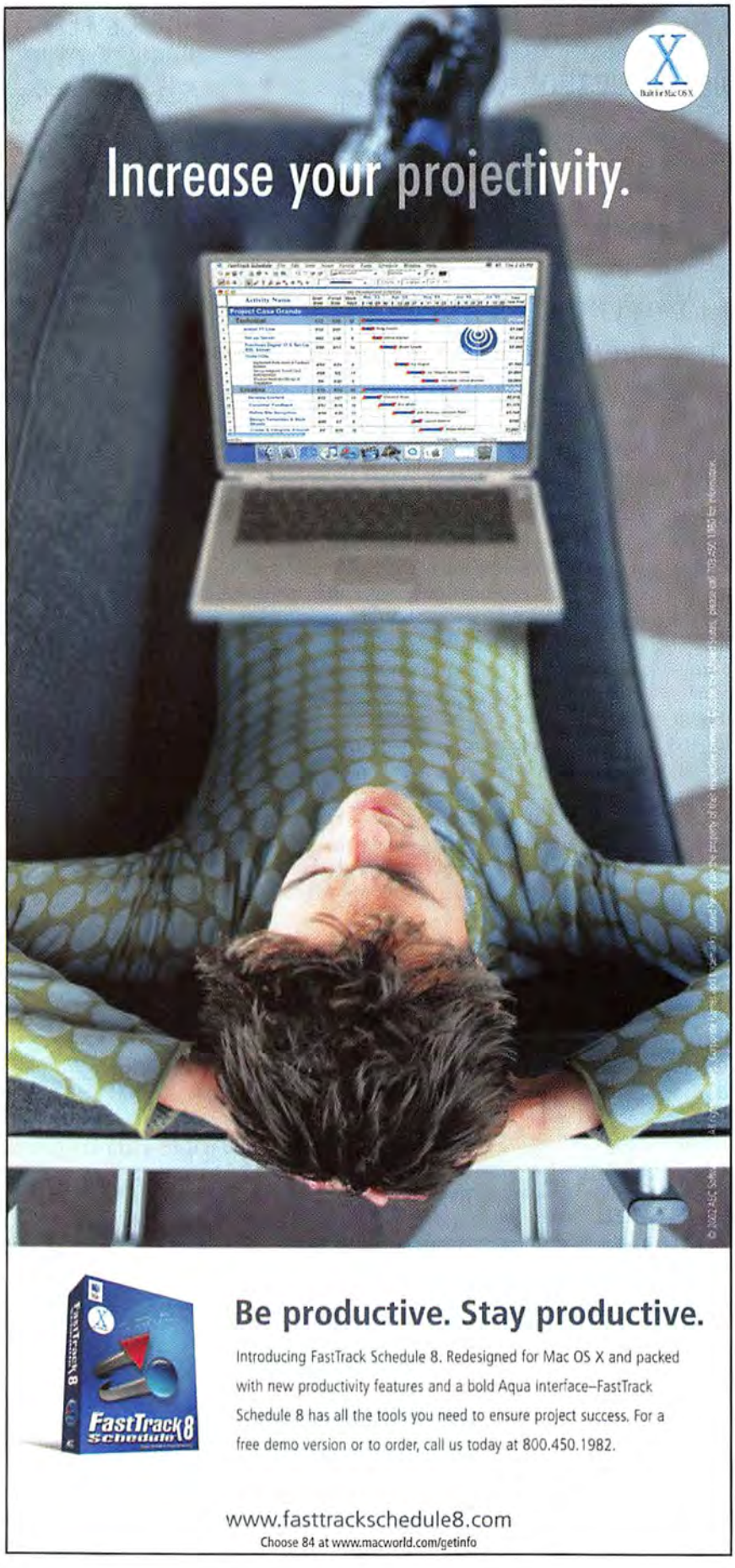

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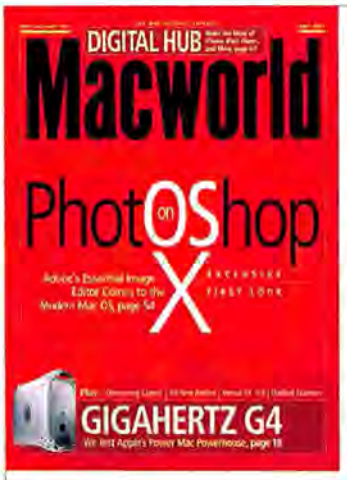

FEEDBACK

To X or Not to X

We at *Macworld* may have beefed up our OS X coverage, going so far as to replace our classic red mice with aqua models in the April 2002 issue. But it seems that some Mac users don't know whether it's time to count on X. If you're reluctant to switch to the new OS, you can take comfort in two things: we aren't abandoning OS 9 anytime soon, and OS X–native versions of programs such as Connectix Virtual PC, Microsoft Word, and Adobe Photoshop inspire just as much passion as their predecessors did. The OS may be different, but the fervor of our readers remains the same. □

A Classic Dilemma

HOWARD BROTINE

After reading "Classic Begone!" (*From the Editor's Desk*, April 2002), I am further put off by *Macworld*. So now that Photoshop 7 is out, any notion of the Classic environment has become a distant memory? That's great for you, but what about the many Mac artist types out there with limited budgets and the ability to be patient with this Mac logjam? Are we also a distant memory?

MARTIN M. MUNE

I like it that *Macworld* is committed to making the OS X switch as painless as possible for the user community, but I think you should also discuss the proper use of corporate equipment, to educate Mac users working on corporate networks. A few issues back, you showed users how to bypass standard login procedures and gain admin rights to a computer by accessing the backdoor mechanisms of OS X or by using shareware utilities ("Mac OS X First Aid," October 2001). This is probably proper behavior for home users, but in a corporate environment it isn't. IT departments lock down systems mainly because they want to minimize the loading of noncorporate software that can potentially damage the system configuration, create an unstable system, or introduce a security issue.

DAVID HENDERSON

I'm the director of computer technology for a school district outside Rochester, New York. I'm responsible for more than 750 desktop computers, 500 of which are Macs. I'd like to start switching users to OS X, but three applications I rely on are not yet available for OS X.

Most of my servers are PCs running NetWare 5.1. Currently, the only method for connecting a Mac to a NetWare server is to use Prosoft Engineering's client software. Prosoft hasn't yet released an OS X client, but it hopes to do so by late summer.

We currently use Apple Software Restore to make an image of a Mac and apply that image to similar models. Using this software, we can roll out dozens of Macs in no time at all, but two problems become apparent when OS X enters the mix—how to clone a Mac that has two partitions, and how to overcome Apple Software Restore's 2GB limit.

Finally, schools rely on desktop security software to prevent students from trashing items on the hard drive and changing settings in control panels. I have not found this type of software for OS X.

What Price AirPort?

TODD RUSTON

Shelly Brisbin dinged the AirPort Base Station significantly (*Reviews*, April 2002) for being more expensive than its competitors, comparing it with two products that don't have two important features that the AirPort does—a built-in modem and AOL compatibility. For the considerable number of people that live outside broadband-enabled areas, the modem-sharing feature is a major selling point. I'm all for finding and using lower-cost non-Apple products, but I have not been able to find any competing home router and wireless access point that includes the built-in modem feature. I don't think it's fair to imply that the Apple product is overpriced when it provides more capability than the products you're comparing it with.

BOB COOGAN

The main reason Apple has only a small percentage of the consumer market is overpricing. Your AirPort review offers a prime example. The iBook notwithstanding, Apple has a serious problem with reaching mainstream America, because the company's products simply cost too much.

A Way with Word

EDWARD J. FLESCH

Thanks to Nan Barber and David Pogue for reminding me of the usefulness of Microsoft Word's macro feature in "Teach Word New Tricks" (*Secrets*, April 2002). I'd recommend one refinement to the procedure in step 4. After replacing all double return characters (^p^p) with placeholders, rather than simply deleting the remaining return characters (^p), I programmed the macro to replace each one with a space, since at times such spaces are needed. Then I added another global replacement of double spaces with single spaces.

STEVE SCHLEIN

Step 2 in "Teach Word New Tricks" says that you can drag the name of a new macro from the Customize window to a menu. Unfortunately, in Word 98 Special Edition for the iMac, all the menus are dimmed when the Customize window opens, and there is no duplicate menu bar. To create a duplicate menu bar, click on the Toolbars button in the Record Macro window. Then click on the Toolbars tab in the Customize window. Under the Toolbars tab, select Menu Bar from the scroll-down list of toolbars. A duplicate menu bar will appear.

FRANCIS SAKAMOTO

To demonstrate the "power" of Word to eliminate line breaks, you list several steps taking up nearly two pages (albeit with illustrations). Changing straight quotation marks to curly ones takes up another step

and yet another column. Just performing these simple tasks takes an unnecessarily long time in Word and is annoyingly complicated. In comparison, I've set up my Mariner Write software using QuicKeys so that pressing ⌘-return eliminates all the unnecessary returns and pressing shift-option-[(left bracket) changes all the straight quotation marks and apostrophes to curly ones. What takes quite a while in Word (unless you create the suggested macro) takes less than 5 seconds in Mariner Write.

Life in the Fast Lane

CHRIS DUBUQUE

You gave Connectix's Virtual PC 5.0 a four-mouse rating (*Reviews*, April 2002), saying it performed "flawlessly." You must be on a different planet from the rest of us. The speed of VPC in OS X is a major problem. Even with Connectix's recent 5.0.2 update, the program's speed is totally unacceptable, even for basic stuff. VPC 5 seems to have much greater difficulty than earlier versions in communicating with your Mac. This includes getting it to recognize the modem, printing through the Mac, using floppies, and dragging and dropping between desktops. With Connectix's new $35-a-call tech support, getting these functions to work can be very expensive.

MARK WIALBUT

Although I agree that VPC 5.0 works well at emulating a Windows environment on the Mac, Jonathan Oski failed to educate potential buyers about the speed at which it does so—slow. If real-world Windows PCs truly ran at the speed of VPC 5.0 on OS X, there would be no Windows PCs on any desks. Another overlooked area of VPC's performance is its connectivity to the outside world. As someone who travels on business a lot, I must use a dial-up connection via VPC running Windows 98 SE to facilitate connection to my corporate mail server using Outlook. After waiting about ten minutes while all the various things set up (VPC, Windows, Outlook, Dialer, and VPN), I get a connection that has never exceeded 9.6 Kbps. The true throughput is half that on a good day.

DENNIS PUETZ

I currently have a PowerBook G4/400 and find that the performance of Virtual PC 4.0 is at best acceptable. When you estimated the performance of VPC 5.0 to be similar to that of an IBM ThinkPad 600X, I couldn't believe my eyes. I wondered if the faster processor really makes that much of a difference or if something else might be causing VPC to be so much faster in your tests than in my experience.

I ran my comparisons on both OS X and OS 9.2.2. I devoted more time to thorough comparisons using my Quicksilver G4/867 (as opposed to the PowerBook G4/500). I did side-by-side timed comparisons of the ThinkPad 600X and the G4/867. Granted, the G4 I used had quite a bit of memory, as well as a faster processor and a faster hard disk than your PowerBook.—Jonathan Oski

Dated Photos?

JOHN CONACHER

"The Wait Is Over" (April 2002) was an extremely helpful Photoshop article, which persuaded me that I should upgrade sooner rather than later. However, on close examination of the EXIF data in the "Rank and File" screenshot, I was interested to see a file creation date of "11/30/79 10:00:00 PM." Is Deke McClelland 22 years older than we think, or have I found someone else who's had the same problem I've experienced with file creation dates?

This seems to vary from camera to camera. The Olympus E-10 and E-20N record creation dates as "1979" but record modification dates as the date you shot the image. Other cameras give the same date for both. As far as I can tell, it has nothing to do with either Photoshop or Mac OS.—Deke McClelland

Catching Streams

STEVE MARTIN

In talking about converting Real Audio files to MP3 files (*Mac 911*, April 2002), Christopher Breen failed to mention the option of using Streamcatcher to capture audio streams in OS X. I have been using it for only a few days and think it's a great way to capture and burn streaming audio.

Although Streamcatcher is a cool program, it doesn't handle all streaming audio, such as the Real Audio files I addressed in the April column.—Christopher Breen

No Accounting for Advice

DAVE LAZAUSKI

Show me a businessperson who would trust vendor and customer lists, accounting records, and databases to an off-site location, as Jeffery Battersby recommends in your roundup of accounting software when he gives the highest score to Oracle Small Business Suite (*Reviews*, April 2002), and I'll show you a fool who'll soon be out of business. I'll spend my money on AccountEdge every time and know that my customers, vendors, backups, and private business and accounting records are safely tucked away in my computer, not up for grabs somewhere on the Internet.

Carbon or Cocoa?

WASSIM JABI

Although my taste buds can immediately tell the difference between an ice-cold carbonated soda and a hot cup of cocoa, it is becoming difficult to tell Carbonized and Cocoa applications apart in OS X. What I find unfair is that Carbonized applications are called native while the truly native applications are called Cocoa.

Carbon applications and Cocoa applications are both *native. Since most Mac users care as little about whether programs are based on Carbon or Cocoa as they do about whether programs are written in C++ or Pascal, we simply refer to all these applications as OS X native.—Ed.*

Post comments on our forums (www.macworld.com), or send them by mail to Letters, *Macworld*, 501 Second Street, 5th Floor, San Francisco, CA 94107; or electronically to letters@macworld.com. Include a return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters and posts. All published letters and forum comments become the property of *Macworld*.

CORRECTIONS

In our review of Dave 3.1 (April 2002), we listed an incorrect phone number for Thursby Software. The correct number is 817/478-5070.

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THE eMAC: A 17-INCH DISPLAY AND A 700MHZ G4 CPU—FOR EDUCATION ONLY

Head of the Class

>> Take one look at Apple's new eMac, with its CRT display and familiar tapered shape, and you may find yourself reminiscing about the original iMac. But look closer, and you'll see that the eMac is quite different from its older sibling. Powered by a G4 processor and featuring a 17-inch flat-screen display, the eMac will be the toast of the teachers' lounge—but if you're not affiliated with an educational institution, you may never be able to buy one.

Apple officials say that the company created the eMac to specifically address the needs of academic institutions that may not be able to afford a lot of $1,399 flat-panel iMacs, and schools that may fear that the computer's fragile-looking screen and neck won't stand up to the heavy punishment schoolkids can dish out (see "Does the eMac Make the Grade?").

The result is a solid, all-in-one machine with a 17-inch flat-screen CRT display that has a maximum resolution of 1,280 by 960 pixels. The eMac's screen provides 40 percent more viewing area than the old iMac's 15-inch CRT display. At the heart of the eMac is a 700MHz G4 processor with a 100MHz system bus, making this system much speedier than the CRT-based iMac. The eMac's video is powered by the same Nvidia GeForce2 MX technology that the flat-panel iMac uses.

Will the eMac ever make it to a desktop near you? That depends on whether you're reading this magazine on school grounds. If not, you'll have to wait and hope. (See "Will the eMac Stay in School?" for more.)—JASON SNELL

Will the eMac Stay in School?

It's got a 700MHz G4 processor, a 17-inch flat-screen CRT display, a slew of ports, and an optional CD-RW/DVD-ROM Combo drive. The most expensive configuration also happens to cost $200 less than the low-end flat-panel iMac model.

And it's not for you—unless you're a teacher, a student, or somehow affiliated with an academic institution that has access to the Apple Store for Education.

While the eMac may have been built specifically for use in the classroom, it will almost certainly appeal to a broad array of Mac users. Could Apple eventually add the eMac to its regular product line, where it might serve as a lower-cost desktop alternative to the flat-panel iMac?

Analyst David Bailey, of Gerard Klauer Mattison, thinks that doing so would be a smart move. "The reception for the eMac among consumers would be very strong," says Bailey.

Apple isn't ruling out such a move—"Anything's possible," shrugs Apple's Greg Joswiak—but the company isn't necessarily giving it much thought, either. "This is not a retail machine. It's not a consumer machine. It's meant for education," Joswiak says. "It was really important that we didn't lose focus [about] who it was for."

Other analysts are lukewarm about the possibility of the eMac hitting the consumer market. Tim Bajarin, of Creative Strategies, thinks Apple would be better served by concentrating on getting the flat-panel iMac's production costs down and letting that machine drive its consumer efforts.

"People are so enamored with the flat-panel iMac, the existing [CRT-based] iMac almost looks passé," Bajarin says. "And it's hard to go back."

Besides, Giga Information Group's Rob Enderle notes that a year ago, Apple was committed to phasing out CRTs. Selling the CRT-based eMac to consumers "would be a reversal," Enderle says. "And I've never known Steve Jobs to reverse himself easily."—PHILIP MICHAELS

WHAT'S NEXT

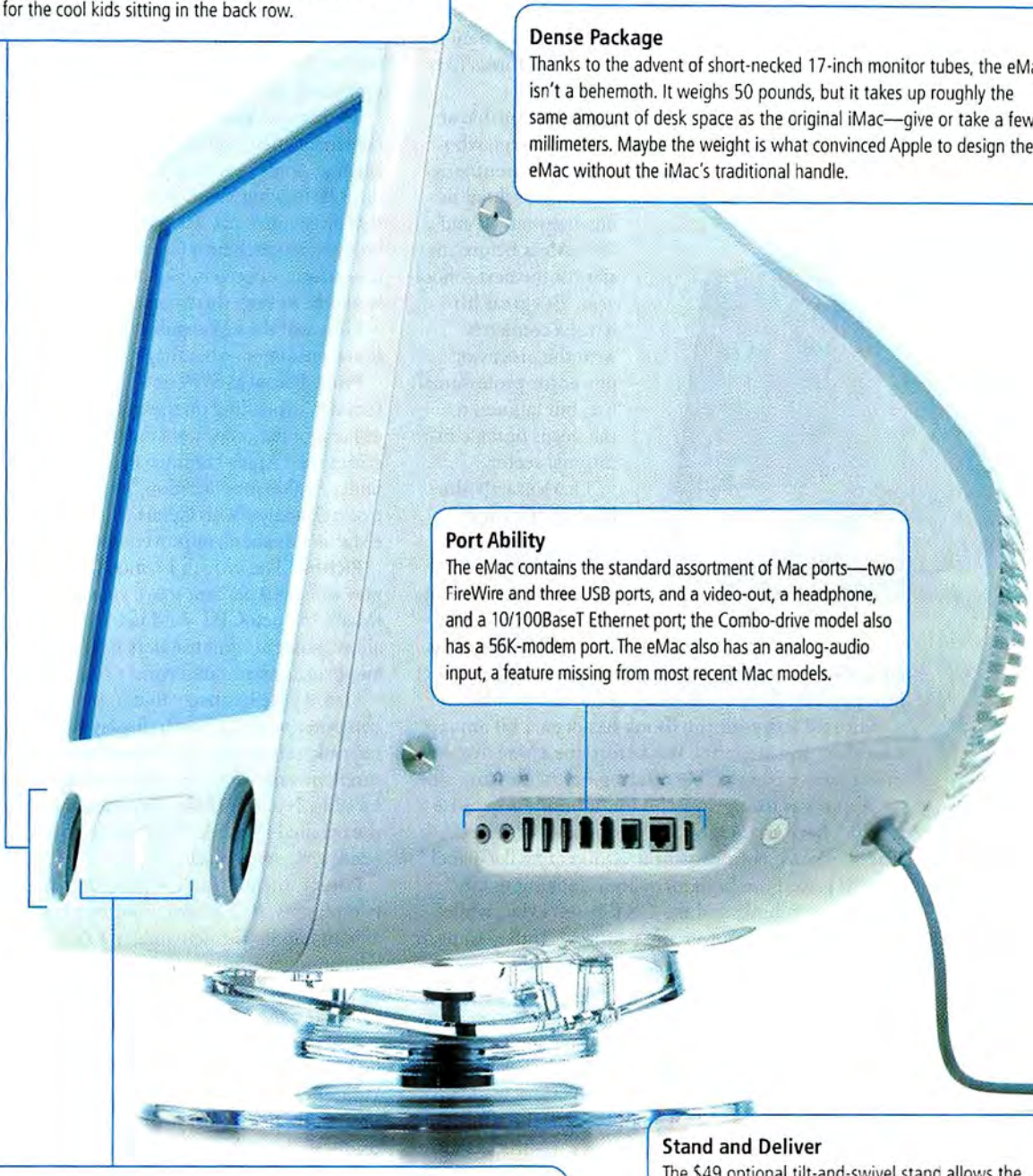
The Mac world's big event, Macworld Conference & Expo, will be at New York City's Jacob Javits Center July 17 through July 19.

Now Hear This

Like the speakers on the current Power Mac G4, the eMac's speakers are exposed. But have no fear—Apple supplies snap-in protective grilles in each eMac box. The speakers themselves, at 16 watts of digitally amplified sound, pack a punch that the original iMac's speakers (2.5 watts of analog sound) couldn't hope to match. The result is loud, clear sound—even for the cool kids sitting in the back row.

Dense Package

Thanks to the advent of short-necked 17-inch monitor tubes, the eMac isn't a behemoth. It weighs 50 pounds, but it takes up roughly the same amount of desk space as the original iMac—give or take a few millimeters. Maybe the weight is what convinced Apple to design the eMac without the iMac's traditional handle.



Port Ability

The eMac contains the standard assortment of Mac ports—two FireWire and three USB ports, and a video-out, a headphone, and a 10/100BaseT Ethernet port; the Combo-drive model also has a 56K-modem port. The eMac also has an analog-audio input, a feature missing from most recent Mac models.

Stand and Deliver

The $49 optional tilt-and-swivel stand allows the eMac to pivot with ease and adds style and flair. But you'll need to remove the stand if you want to install additional RAM, which goes behind a door in the bottom of the unit.

Welcome Mat

The shiny Apple on the front of the eMac marks the entry to this new computer's optical drive (the Combo-drive model costs $1,199; the CD-ROM-drive model, $999). A sticker on the drive door lists the eMac's serial number and Ethernet ID, in human-readable and bar-code form—a boon to educational institutions that need to log and track computer purchases. Remove two screws from a panel above the optical drive's tray, and you'll find a place to install an AirPort card.

STAN MUSLER

EDUCATORS REACT

Does the eMac Make the Grade?

Marco Torres's classroom may be jammed with a rainbow of assorted iMacs and iBooks, but the all-white eMac has caught the eye of the San Fernando Senior High School social-sciences teacher. And Torres likes what he sees.

"I like the fact that a supercomputer is available at the school level for under $1,000," says Torres, who expects his Southern California school to buy between 60 and 200 eMacs before the start of the next school year. "It's great [to have] a computer with the processor power for professional use, but tailored to the needs of the educational sector."

That's exactly the kind of talk Apple hopes to hear more of after the launch of the classroom-friendly eMac. Apple sought out feedback from its education customers and then created a computer that it hopes will shore up its place in the classroom.

Released last year, the iBook has been a hit among educators and students. But before the eMac, Apple didn't have a comparable offering on the desktop side.

"Apple was losing an awful lot of business because it didn't have an under-$1,000 product," says Rob Enderle, of Giga Information Group. The flat-panel iMac is priced too high for schools looking to buy computers in bulk, and the CRT-based iMac, while affordable, lacked power and features. "If they want to do movies, the things educators want to do, they're between a rock and a hard place," adds Enderle.

Education is a crucial—and lucrative—market for Apple. But it's also one where the company faces mounting competition. According to market-research firm Quality Education Data (QED), Macs made up 31 percent of the installed computers in the education market during the 2000–01 school year—the largest share of any single computer maker. But Wintel machines make up 64 percent of that total—up from 47 percent in 1998–99. And that share is expected to grow; QED estimates that 74 percent of the planned purchases and leases during the 2001–02 school year will be DOS/ Windows computers. Macs will make up the other 26 percent.

To that end, the introduction of the eMac isn't about convincing new users to switch to the Mac; it's about keeping Apple's existing customers satisfied. "The school districts backing Windows are going to keep going in that direction," says Tim Bajarin, president of tech-industry research firm Creative Strategies. "[For Apple], it's a matter of keeping people from defecting. The goal would be to keep them committed to the Mac."

How will the eMac pull that off? By giving educational customers what they're asking for:

Price Priced at $999 or $1,199 (for educational institutions), depending on the optical drive you order, the eMac promises educators more bang for their buck. "It's critical that Apple continue to have a desktop offering under $1,000 for education," says David Bailey, a research analyst with Gerard Klauer Mattison. "And the eMac is a dramatic improvement over the CRT iMac."

Picture The eMac's 17-inch flat-screen CRT display offers 40 percent more viewing area than the iMac's 15-inch CRT. And the eMac's higher resolution allows students and teachers to work on documents and projects without having to scroll.

Size Apple has been able to build an all-in-one computer with a 17-inch display for a while, says Greg Joswiak, senior director of hardware products. "The problem with each and every one is they were huge," he adds. Not the eMac—it's roughly the same size as the original iMac. And that's a major selling point for educators, says Bajarin.

Power Including a G4 processor was critical for two reasons, Bailey says. First, the faster CPU is better able to handle the demands of OS X, helping Apple's education customers migrate to the new OS. Second, Apple's assorted "i-apps," such as iPhoto and iMovie, run faster and smoother on a G4-powered machine.

That last point is key when it comes to distinguishing the eMac from its cheaper but stripped-down Wintel rivals. "We're not just trying to create a word processing machine," Joswiak says. "What we've been trying to do with education is make a better teaching tool, a better learning tool."—ADELIA CELLINI AND PHILIP MICHAELS

Star Pupil

PRICE*	CPU	RAM	DISK	SYSTEM BUS	CACHE	OPTICAL DRIVE	VIDEO CARD
$1,199 eMac	700MHz G4	128MB	40GB	100MHz	256K Level 2	CD-RW/DVD-ROM Combo	Nvidia GeForce2 MX
$999 eMac	700MHz G4	128MB	40GB	100MHz	256K Level 2	CD-ROM	Nvidia GeForce2 MX

* Prices for educational institutions; eligible individuals will pay an additional $50.

APPLE'S UPDATED POWERBOOKS

Change Comes from Within

You won't find a lot of changes on the surface of Apple's newly updated Titanium PowerBook G4. But open up the portable's familiar silvery casing, and you'll find a completely different computer inside. Apple has bolstered the PowerBook's processing punch, sharpened its graphics, and given Mac users another opportunity to see the big picture.

The new PowerBook features an 800MHz or 667MHz G4 chip, up from 667MHz and 550MHz in the previous configurations. More important, the PowerBook now comes with a 1MB DDR SDRAM Level 3 cache, in addition to a 256K Level 2 cache. The Level 3 cache provides quick access to data en route to the processor, with DDR RAM pushing through data on both the rise and the fall of the clock signal. That translates to a serious performance boost, as Macworld Lab's tests show. (See our review of the new PowerBook G4, *Reviews*, elsewhere in this issue.)

This PowerBook G4 also has an ATI Mobility Radeon 7500 graphics card with 32MB of DDR memory, resulting in faster 3-D–effects rendering, full-frame-rate DVD video playback, and speedier visual effects. PowerBook users will now be able to see the results on a screen that offers 1,280-by-854-pixel resolution and provides 23 percent more workspace than the previous models' 1,152-by-768-pixel resolution. For PowerBook users who demand even more screen space, Apple has released a $49 DVI-to-ADC Adapter, which can hook up one of the company's flat-panel displays to this PowerBook's Digital Video Interface (DVI) port. Finally, the new PowerBook is cooled by two independent fans that make this laptop cooler and quieter than its predecessor.—PHILIP MICHAELS

INTRODUCING XSERVE

Apple Gets Serious about Servers

Running a Mac-based server has always been a challenge. OS 9 was a decent server operating system, but it didn't offer the power and compatibility of the Unix-based OS X. And Mac hardware has traditionally been designed for the desktop, making it poorly suited to the world of server closets and storage racks.

At least, that was the case until Apple unveiled its latest G4 Mac, the Xserve, which is due to arrive in June. Measuring 17.6 inches wide, 28 inches deep, and a startling 1.73 inches high (or "1U" in server-rack parlance, meaning that it takes up one unit of rack space), the Xserve runs only Mac OS X Server and can be mounted into a standard rack in your company's server closet.

The Xserve can be configured to suit your needs. It can be powered by either one or two 1GHz G4 processors with a 256K Level 2 cache and a 2MB DDR Level 3 cache; the Xserve uses DDR SDRAM running at 266MHz, with a minimum capacity of 256MB and a maximum of 2GB. Two Gigabit Ethernet ports are standard, and two other PCI slots are available for you to populate with expansion cards. You can choose between one and four hot-swappable ATA hard drives in 60GB or 120GB configurations—the Xserve can currently hold as much as 480GB of data. If you want to swap out an Xserve drive, just press the front of that drive, wait for the LED to indicate that the drive has unmounted, and pull it out. A CD-ROM drive and the usual assortment of FireWire and USB ports (including one FireWire port on the front for easy software-loading access) are standard. The Xserve's innards slide out of its shell on a drawer, allowing for easy access to its parts for servicing.

Running an updated version of Mac OS X Server, the Xserve includes OS X–native administration software that lets you see at a glance how the server is running. It will alert you via pager or e-mail if any subsystem is in danger of failing. Administrators will also be able to configure Xserve using Hewlett-Packard's popular OpenView server-management software.

Xserve configurations start at $2,999, but you can add custom features via the Apple Store—an "ultimate" configuration costs $7,799.—JASON SNELL

LATEST UPDATE BOOSTS CPU SPEED, DOUBLES ON-CHIP CACHE

The iBook Caches Up

The iBook hasn't been left out of Apple's recent spate of product introductions and updates. And while the changes to the consumer-friendly laptop aren't as dramatic as the revisions to the Titanium PowerBook G4, the latest version of the iBook features beefed-up processing power and new graphics capabilities.

The iBook's G3 processor now sports a top clock speed of 700MHz, up from the 600MHz limit in last year's version. Just as important, the processor now has a 512K Level 2 cache. The larger a processor's cache is, the more efficiently the processor can run (because it can keep more data close at hand). The iBook's storage space has also gotten a boost; this iBook comes with either a 30GB or a 20GB hard drive (40GB is a build-to-order option). The previous version offered only 20GB and 15GB capacities.

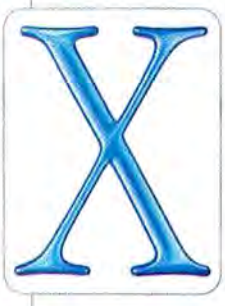
The iBook's ATI Rage Mobility 128 graphics processor has been swapped out for a more powerful ATI Mobility Radeon graphics accelerator with 16MB of dedicated memory and AGP 2× support.

A 700MHz iBook with 256MB of RAM, 30GB of storage, a DVD/CD-RW Combo drive, and a 14.1-inch display sells for $1,799. The 700MHz iBook with a Combo drive is also available with a 12.1-inch display, 128MB of RAM, and a 20GB hard drive, for $1,499. The $1,199 configuration comes with a 600MHz G3 processor, 128MB of RAM, 20GB of storage, a 12.1-inch display, and a CD-ROM drive.—PHILIP MICHAELS

APPLE PREPARES "JAGUAR" UPDATE |

Mac OS X Leaps Forward

Last year, Mac OS X 10.1 transformed Apple's new operating system from a rickety platform to a much sturdier, usable OS. The next major OS X update—code-named "Jaguar" and due out by late summer—offers more than stability. It adds a host of new features and a collection of new and updated applications from Apple. Jaguar's goal, then, is not necessarily to tweak OS X's existing capabilities but rather to expand those capabilities into new areas. The result, Apple hopes, will be a more powerful and versatile operating system.



New Features

It wouldn't be a Mac OS update without changes to the Finder. Jaguar marks the return of spring-loaded folders, a feature missing since OS 9. Another returning feature is an integrated approach to finding files, allowing you to quickly find an item on your hard drive by typing its name in a Finder window.

Other OS 9 features in this OS X update include the Simple Finder and USB Printer Sharing. And OS X has gained some of OS 9's accessibility features, such as screen zooming and inverting, a basic screen reader, and visual notification of beeps.

New Applications

Jaguar will introduce iChat, an instant-messaging client with a highly Aquafied spin on AOL's Instant Messenger program. Messages from friends appear in small text bubbles, like the ones you'd find in a comic book.

With file-finding features back in the Finder, Sherlock becomes a Web-services search tool in Jaguar. Sherlock III lets you search Web-based news and information sources, including a yellow-pages service. Web pages and other content appear within the Sherlock window.

Apple's free Mail application has also been refreshed. This new Mail will add improved filter support, intelligent spam filtering, cross-mailbox searching, and support for secure mail connections.

New Technologies

Jaguar will include QuickTime 6 (see "Coming Attraction," *Mac Beat*, April 2002), the latest version of Apple's stalwart multimedia format. Jaguar also has an update to the Quartz drawing technology at the heart of OS X; this dramatically improves the compositing of video and 3-D objects on systems with AGP 2× video cards that have 32MB of video memory.

Apple has replaced OS X's useless Address Book application with something much more dramatic—a shared Address Book database that's meant to be a systemwide repository for personal information about a computer's user and everyone they know.

Conjuring up memories of the Newton handheld device, Jaguar introduces Inkwell—users can write text by hand and insert it into any text field. When you begin a pen stroke on a graphics tablet, for example, a floating window resembling a yellow legal pad appears. After you stop writing, Inkwell transforms your handwriting into standard text.

The most interesting new technology in Jaguar is Rendezvous, which is also known as Zero-Configuration Networking. It allows devices on local networks to sense the presence of one another and dynamically share data. The Rendezvous technology is integrated in iChat, which can place all of a local network's users on a shared "buddy list."—JASON SNELL

THE READERS SPEAK |

Mac OS X: One Year Later

As Apple readies another update to Mac OS X, the company can point to several encouraging signs that the OS it released in March 2001 is gaining wider acceptance. The new operating system has already undergone one successful major update. And software makers have responded with a steady stream of OS X–native releases—indicating that Mac developers are embracing Apple's next-generation OS. But has OS X found a place in Mac users' hearts—and on their hard drives? Or does the sight of Aqua make them see red? To find out, market-research firm Karlin Associates surveyed 401 *Macworld* subscribers, in April 2002, and asked them what they thought about OS X.

Sixty percent of the subscribers we surveyed had installed OS X on a Mac, and 53 percent still had OS X on their hard drives. Among those with OS X installed, 58 percent described it as their default operating system. For survey participants who hadn't yet taken the OS X plunge, the absence of critical native applications remained the most common reason. And 46 percent of those surveyed thought that the responsibility for OS X's long-term success was equally split among Apple, Mac developers—and themselves.—PHILIP MICHAELS

Is OS X currently installed on a Mac you use?

Yes	53%
No	47%

Total respondents: 401.

Which of the following is the default operating system on the Mac you use?

OS X	58%
OS 9	41%
OS 8	1%

Total respondents: 211 (those who currently had OS X installed).

More Info:

www.macworld.com/2002/07/macbeat/poll.html
Get the full results of our OS X survey, and find out how you can take part in future *Macworld* polls.

NATIVE DRIVERS APPEARING FOR INPUT DEVICES

Of Mice and Macs

Until recently, Mac users could have either OS X or a programmable mouse—but they couldn't have both. Programmable input devices require drivers, and most mouse makers hadn't yet updated the software that accompanies their products. This situation has changed dramatically in the last few months, and most input-device manufacturers have released OS X–native versions of their driver software. Others have released beta versions, and a few have announced OS X plans.—LISA SCHMEISER

Kensington (800/235-6708, www.kensington.com) updated its MouseWorks for Mac OS X software to version 1.1 in March, and a beta of the version 2.0 software is now available. MouseWorks can be downloaded from www.kensington.com/support/sup_1170.html.

The Logitech TrackMan Wheel

Logitech (800/231-7717, www.logitech.com) is among the last input-device makers to release a native version of its driver software. Although Logitech USB devices are capable of pointing and clicking when plugged into a Mac running OS X, users will have to wait until the end of summer before an OS X–compliant driver is available for download.

Macally (626/338-8787, www.macally.com) put out an OS X–only beta version of its USB Mouse/Trackball driver earlier this year. The beta can be downloaded from www.macally.com/techsupport/drivers.html.

Microsoft (800/426-9400, www.microsoft.com/mac) released an OS X 10.1.2 driver, in April, for the Wireless IntelliMouse Explorer, IntelliMouse Explorer, IntelliMouse Optical, Wheel Mouse Optical, Trackball Explorer, and Trackball Optical. The driver can be downloaded from www.microsoft.com/mac/download/hardware/intellitypeosx.asp.

Still no luck? There's always USB Overdrive, a $20 shareware product developed by Alessandro Montalcini (www.montalcini.com/). USB Overdrive is a universal driver that handles any USB peripheral—trackballs, joysticks, game pads, and mice—from any manufacturer and lets the user configure multiple devices on either a global or application-specific basis. The fourth version of the OS X–native beta for mice and trackballs came out in February.

PRODUCT WATCH

JULY 2002

Carrara Deepens

Carrara Studio helps usher graphics pros with a 2-D background into the world of 3-D design. With the latest version of the graphics program, Eovia (888/394-2307, www.eovia.com) is ushering Carrara into the ever-deepening world of OS X.

Carrara Studio 2 ($399; upgrade from version 1, $149; upgrade from any version of Ray Dream, Infini-D, and MetaCreations Carrara Studio, $199) has a number of changes under the hood. The program, which runs on OS 9 and OS X, takes full advantage of OpenGL hardware acceleration to offer users real-time feedback on their designs. Eovia has also beefed up Carrara's selection of rendering engines, the processors responsible for displaying 3-D designs as they would appear in the natural world. In addition to traditional rendering engines, Carrara Studio 2 offers a new Global Illumination engine that combines the powers of ray-tracing and radiosity engines to produce results that are more photo-realistic. For example, this new engine takes into account the reflection of light off a bright surface, refraction, and color bleeding.

Carrara Studio 2 also offers tools for creating character animations, including hierarchical animation with constraints, as well as forward and inverse kinematics. Subdivision modeling lets users quickly add detail to their characters by subdividing simple polygon objects into more complex ones. The program now features the ability to attach bones to 3-D objects, allowing users to modify and deform objects in real time. Users can easily place bones within characters and automatically calculate influence zones, rules that define how bones relate to one another.—KELLY LUNSFORD

Hardware

Digital Cameras

Two digital cameras from Olympus America (800/622-6372, www.olympusamerica.com): The **Camedia C-720 Ultra Zoom** ($599) is a 3-megapixel camera with an 8× optical zoom. It weighs 11 ounces and measures 3.1 by 4.2 inches. The **Camedia D-550 Zoom** ($399) is a 3-megapixel camera with a 2.8× optical zoom and a 3.6× digital zoom.

Printers

Two photo ink-jet printers and a desktop photo printer from Epson (800/463-7766, www.epson.com): The **Stylus Pro 7600** ($2,995) features a 2,880-by-1,440-dpi resolution and prints images as wide as 24 inches. The **Stylus Pro 9600** ($4,995) has the same resolution and prints images as wide as 44 inches. Both printers include the seven-color UltraChrome ink system. The **Stylus Photo 2200** ($699) is a desktop printer designed for photo use; it also has a 2,800-by-1,440-dpi resolution.

Storage Devices

Two external hard drives and a CD-RW drive from Iomega (888/445-6342, www.iomega.com): The **Iomega HDD External Hard Drive** comes in 80GB and 120GB capacities for USB 2.0 ($299, $349) and FireWire ($329, $379). A 40GB USB 2.0 model ($199) is also available. The external **Iomega CD-RW 40X12X48** FireWire drive ($300) sports a digital-audio–extraction speed of 32× and comes with built-in buffer-underrun protection.

A USB hard drive from SmartDisk (941/436-2500, www.smartdisk.com): The **FireFly** hard drive is now available in a 20GB capacity ($400); there is also a previously released 5GB model.

System Hardware

A DVI-to-VGA conversion box from Gefen (800/545-6900, www.gefen.com): The **Ex-tend-it DVI-to-VGA Conversion Box** ($399) lets Mac users attach a VGA display

ICONS: WWW.ANDYMARTIN.UK.COM

WHAT'S HOT

A Quick Look at the World of Tech

1. **Apple takes care of backlogged orders for the flat-panel iMac.** *Credit for eliminating the backlog goes to ramped-up production efforts and Apple's controversial decision to fill every third order with an empty box.*

2. **Apple introduces eMac desktop just for schools.** *"Two vowels down, three to go," Steve Jobs boasts, apparently scotching plans for the occasional release of a yMac.*

3. **The next major update to OS X will feature a built-in instant-messaging client called iChat.** *The version aimed at the education market will be called eChat and will allow students to instantly sass back to their teachers.*

4. **More brick-and-mortar Apple Stores are on the way.** *Apple's aggressive expansion plans will sorely strain America's reservoir of Mac Geniuses.*

to a Mac's DVI port. The box includes its own power supply and cables.

A USB analog video capture product from XLR8 (770/564-5682, www.xlr8.com): The **InterView 2.0** ($90) now supports OS X; it allows OS X users to capture analog video through a USB port from any video source—without booting into OS 9.

Software

Animation

LightWave 7.5, from NewTek (800/847-6111, www.lightwave3d.com): The 3-D–graphics and –animation software has new tools, including sliders that control animations, an Expression Builder, and enhanced OpenGL feedback ($1,595; upgrade from LightWave 7.0, free).

Audio Software

Spark 2.5, from TC Works (www .tcworks.de): The audio-processing application now supports OS X; it also has improved editing features ($399; upgrade from Spark 2.0 and Spark XL 2.0, free).

Cross-Platform Software

Dave 3.1.1, from Thursby Software (817/478-5070, www.thursby.com): The PC-to-Mac file-sharing software now has outbound PostScript-printer support for OS X ($149; upgrade from Dave 3.1, free; upgrade from Dave 2.5, free).

Development Software

CodeWarrior 8.0, from Metrowerks (800/377-5416, www.metrowerks.com): The development tool supports C, C++, Objective-C, and Java, and it lets Mac programmers build Mac OS X and classic Mac OS applications using Carbon, Cocoa, Java, and classic Mac OS technologies ($599; upgrade, $299).

Productivity Software

ConceptDraw Presenter from Computer Systems Odessa (www.conceptdraw.com): The presentation software creates documents that can be exported to PowerPoint. It can also open PowerPoint presentations, edit them with drawing tools, and save them back to PowerPoint with animations added ($199).

SnapTalk 3.0, from Glass Bead Software (978/263-9956, www.glassbead.com): The instant-messaging and file-transfer and -compression software is now OS X native (and runs on OS 8.1 and higher). It offers secure encrypted messaging over TCP/IP and AppleTalk networks ($47 to $489, depending on number of users; upgrade pricing varies).

Utility Software

VersionTracker Pro 2.0, from TechTracker (503/227-2571, www.versiontracker.com): The software-update–tracking utility now monitors the software inventory and version status of as many as ten Macs. The OS X version of the update includes a desktop palette that features hourly updates of the VersionTracker database ($50 per year). TechTracker also announced **VersionTracker Plus**, a Web-based subscription service that lets you perform customized searches ($25 per year).

Announced

Court Ruling

A victory for Adobe (800/833-6687, www .adobe.com) in a patent-infringement suit against Macromedia (800/470-7211, www.macromedia.com): Adobe claimed that the San Francisco software company violated two of its patents on tabbed palettes. A jury awarded Adobe $2.8 million in damages, and an injunction could be issued against Macromedia.—COMPILED BY PHILIP MICHAELS

ILLUMINATING PHOTO EQUIPMENT |

Let There Be Light

At the core of all photography—digital and film—is light. Whether you're taking simple snapshots, action shots, or landscapes, natural light and your camera's built-in flash will most likely be all you'll need to snap good photographs. But if you're looking to try your hand at portraiture or some type of studio photography, you'll want to invest in additional lighting. The problem? The road to enlightenment can be confusing *and* expensive. The Digital Lighting Kit from Photoflex (800/486-2674, www.photoflex.com) aims to get you into the world of studio lighting with a minimum of hassle. The kit's hardware consists of a 500-watt tungsten lamp, light stand, and soft box—a specialized hood that goes over the light source and diffuses light evenly. The package also includes an instructional CD that showcases basic lighting techniques for digital cameras, and setups for creating effective photographs in a studio setting. With prices ranging from $350, for the basic kit, to $830, for a kit with a large soft box, shutterbugs with tight budgets won't be left in the dark.—RICK LEPAGE

Mac OS X Updates

powered by versiontracker.com

Amadeus II 3.5.1
Direct-to-disk sound editor and analyzer with MP3 support

America Online (AOL) 31B
OS X client for online service

Apple iPhoto 1.1.1
Digital-image organizer adds brightness and contrast features

BatChmod 1.3
Changes file ownership and permissions, forces the Empty Trash command

Chain 1.0
Tool for sending instant messages to other Mac users

ContactsPlus 2.75
Contact-management software

Dantz Retrospect 5.0.205
Bug fixes for backup software

Data Rescue X 10.0
Recovers data from crashed disks

DayLite 1.0.2
Customer-relationship management

Fetch 4.0.2
FTP client adds support for 31-character, or longer, file names

FileType 1.0.1
Appearance-savvy file-type changer

FinalDraft 6.0.2.5
Bug fixes, Carbonized "Ask the Expert" feature for screenwriting app

icWord 2.1
Opens and displays Microsoft Word and AppleWorks files

ImageViewer 6.0.3
Image viewer and organizer

iPhoto to PhotoToWeb 1.1.1
Export plug-in for advanced Web sites

iView MediaPro 1.5
Image-management app now downloads and catalogs directly from USB cameras

LaCie SilverKeeper 1.0
Backup utility

Macromedia Flash player X 6.0r29
Browser plug-in for viewing Flash media

MacSFTP 1.0.3
SFTP client

NoteAbilityPro 1.941
Music notation with MIDI input and part extraction

OmniOutliner 2.0rc2
Outlines and organizes tasks and projects

OttoMatic 1.2.1
Bug fixes for adventure game

Pepper 4.0.1
Text editor aimed at programmers, scriptwriters

QPS Que USB CD-RW 1.3
OS X drivers for CD-RW drive

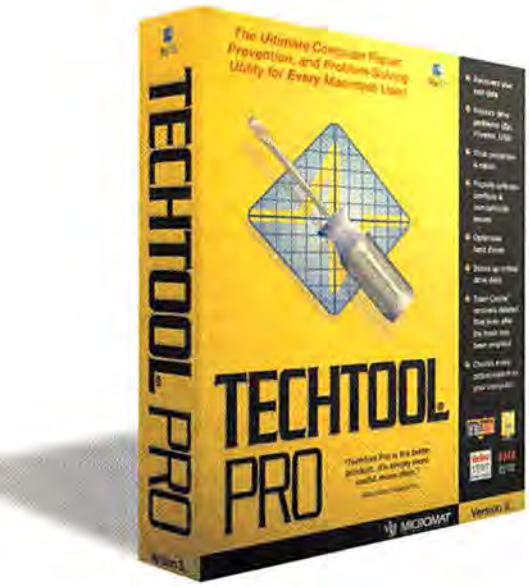
Sound Studio 2.0.2
Audio-recording and -editing tool

Stealth Serial Port X 1.0
Serial-port card for iMacs, G3s, and G4s

Tex-Edit Plus X 4.2.2
Text editor adds enabled auto-repeat for some menu items

For these and other current updates, visit:
www.macworld.com/subject/updates

In with the new...



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?

In with the newer...

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.

Micromat Inc. 800-829-6227 707-566-3831 info@micromat.com www.micromat.com

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RETROSPECT BACKUP 5.0

Industrial-Strength Program Backs Up OS X Data to a Wide Range of Media

BY ADAM C. ENGST

For many Mac users, the reason *not* to upgrade to Mac OS X used to be that Dantz Development's Retrospect Backup—which performs full and incremental backups to a variety of storage devices—couldn't back up and restore Mac OS X volumes.

The OS X–native Retrospect Backup 5.0 now joins other OS X backup utilities that appeared earlier; however, unlike Retrospect, most of them aren't designed for network usage, and many lack tape- and optical-drive support, keep only one revision of changed files, or can't restore an entire OS X system to a bootable state. Although using Retrospect can be confusing for those not well-versed in OS X's user privileges, the program proved itself capable and trustworthy when backing up, restoring, and duplicating files.

Retrospect Backup 5.0 comes in four editions—Express, Desktop, Workgroup, and Server. We evaluated each (see "Retrospect Flavors" for their major differences); unless otherwise specified, all statements refer to all Retrospect editions, which are based on the same code.

New under the Hood

Aside from cosmetic changes that make it Aqua-compliant, version 5.0's user interface and feature set are essentially the same as the highly regarded version 4.3's; the most-significant changes are architectural. Most notably, Retrospect 5.0 runs on OS 9 and OS X 10.1.2 and later, and all editions except Express can use the Retrospect Client software to back up and restore networked Macs running System 7.1 and later. This cross-generation support is important, because many people run Retrospect on OS 9 Macs but need to back up OS X Macs. (Retrospect 5.0 can still back up and restore most versions of Windows.)

Dantz has also lifted two important limitations. Retrospect 5.0's File Backup Sets—very large individual files that contain all the backed-up files used when backing up to a hard drive—are no longer limited to roughly 60,000 files. This change makes backup strategies involving inexpensive FireWire hard drives possible. Retrospect can also now back up Mac (though not Windows) files larger than 2GB. Finally, Retrospect 5.0 supports all writable optical drives shipping in Macs, including the SuperDrive, although it requires that some use CD-R media rather than CD-RW media.

The Mac OS X Experience

In our tests, Retrospect performed well overall in backing up and restoring both OS 9 and OS X hard drives. But we did encounter some flaws and baffling problems, due either to Retrospect's design or OS X's, and the few freezes we experienced generally required a restart.

The complex interactions that Retrospect coordinates between Macs, networks, operating systems, and storage devices have long revealed problems not caused by flaws in Retrospect, and OS X has added more problems that Retrospect might expose. For instance, we were unable to boot from a FireWire drive containing a duplicate of an OS X boot drive, until we first used OS X's Disk Utility to reformat the FireWire drive. Although we noticed the problem because of using Retrospect, the cause was in fact an interaction between Mac OS X and the hard drive's formatting.

Other problems related to OS X are within Dantz's power to fix, but the company doesn't always help as much as it could. For example, the manual repeatedly warns you to turn off OS X's Ignore Privileges On This Volume setting when you are restoring to other volumes; it would be more helpful if Retrospect turned this setting off when appropriate during restoration.

In other cases, Retrospect is at the mercy of OS X. Retrospect can see and back up file privileges only if the Mac being backed up is running OS X; backups made while that same Mac is running OS 9 won't restore a working OS X system. Even when you're restoring properly backed up files, be careful—restoring an entire disk writes files with their original privileges, while restoring selected files and folders writes them with the privileges of the currently logged-in user on the destination Mac.

Retrospect Flavors: Which Is Right for You?

For Individuals: Retrospect Express Backup
For people with only one or two Macs, Retrospect Express is sufficient. You probably don't care that it won't run alongside AppleShare IP or Mac OS X Server, doesn't support tape drives, and can't transfer files between backup sets. Also, Retrospect Express can restore documents only to the hard drive of the Mac running Express. You also can't create custom selectors, which allow you to include or exclude files from a backup.

For Small Offices: Retrospect Desktop Backup
If you need to back up multiple Macs over a small network, or if you want to use a SCSI tape drive to perform backups, you're going to need Retrospect Desktop. It supports Retrospect Client (which is sold separately), it supports custom selectors, and it lets you transfer files between backup sets. Retrospect Desktop won't run alongside AppleShare IP or Mac OS X Server, though, and it can add Retrospect Clients only for Macs on the same subnet. In addition, it doesn't support tape-drive autoloaders that handle more than eight tapes.

For Midsize Offices: Retrospect Workgroup Backup
The next level of Retrospect is for offices that have more-complex networks, need to use large tape-drive autoloaders, or use a single Mac OS X Server or AppleShare IP server. Retrospect Workgroup can back up the server if it's installed on the same Mac, can add Retrospect Clients on different networks, supports the full set of tape autoloaders, and includes 20 client licenses.

For Large Organizations: Retrospect Server Backup
Anyone who needs Retrospect's full power and more than 30 Retrospect Client licenses is going to need Retrospect Server, which can back up multiple Mac OS X Server or AppleShare IP servers and includes 100 Retrospect Client licenses.

22 **OS X backup software**
Retrospect Backup 5.0
23 **Web-animation application**
Flash MX
26 **High-end portable**
Apple Titanium PowerBook G4/800
27 **Compositing and rotoscoping application**
Combustion 2
28 **Digital-asset managers**
Cumulus 5.5 Single User Edition, Portfolio 6
30 **7 Wireless broadband routers**
32 **Web-animation software**
Adobe LiveMotion 2.0
34 **3-D–animation program**
Universe 4
35 **QuarkXPress plug-in package**
QX-Tools Pro
35 **Packet analyzer**
EtherPeek 4.1
36 **Palm-synchronization software**
Palm Desktop 4.0
37 **Desktop system**
Apple iMac G4/700
37 **Photoshop and Fireworks plug-ins**
Splat 1.0
37 **Slide-show–creation program**
LiveSlideShow 2.0
37 **ATA drive attachment**
WiebeTech FireWire DriveDock
38 **Financial program for small businesses**
FirstEdge
40 **Two-track audio editor**
Peak 3
41 **Web server software**
4D WebStar V 5.1
42 **Cross-platform programming software**
Revolution 1.1.1
42 **WYSIWYG Web-design program**
PageSpinner 4.0
45 **The Game Room**
Escape Velocity: Nova, Wipeout 2097, Coldstone Game Engine, Wish Technologies Adaptold
72 **9 FireWire hard drives**

OUTSTANDING: ●●●●● VERY GOOD: ●●●● GOOD: ●●● FLAWED: ●● UNACCEPTABLE: ●

Déjà View Retrospect Backup 5.0's interface is very similar to that of previous versions, though Dantz has updated it to comply with Aqua.

OS X support for hardware, particularly devices specifically related to backup, remains spotty. Many SCSI cards still don't work reliably with Retrospect, and although Retrospect Express supports entry-level USB tape drives in OS 9, that support won't carry over to OS X until Apple adds support for USB tape drives. And don't assume you can use every storage device; be sure to check Dantz's list of compatible hardware at www.dantz.com.

Documentation and Support

Retrospect's manual explains the program well, but we'd prefer more in-depth explanations of OS X specifics. Many such details exist only in the Read Me document, which users may overlook.

Dantz provides numerous free technical-support resources on its Web site, but the company now charges for telephone or e-mail support. New purchasers get free support for 30 days, but given the program's major changes related to OS X, that policy should be extended to upgraders. Though you'll likely have to pay for it, Dantz's attentive tech support suggested appropriate solutions to our problems and followed up with more suggestions via e-mail.

Macworld's Buying Advice

Despite quirks and oddities related to OS X privileges, Retrospect Backup 5.0 is the most capable personal backup program available for backing up and restoring entire Mac OS X hard drives.

Retrospect Backup 4.3 users who need to use OS X to perform backups should upgrade, as should those who suffered from 4.3's limitations. Mac users without a coherent OS X backup strategy should also seriously consider Retrospect Backup 5.0. □

RATING: ●●●●

PROS: Simple, familiar interface; Retrospect Client software works well over networks and does not affect OS X client-machine performance; compatible with many types of drives.

CONS: Confusing interactions with OS X; occasional freezes; fee-based support.

PRICE: Retrospect Express Backup, $50; Retrospect Desktop Backup, $150; Retrospect Workgroup Backup, $310; Retrospect Server Backup, $480 (lower upgrade prices available)

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Dantz Development, 925/253-3000, www.dantz.com

FLASH MX

Popular Web-Animation and Interface-Design Program Is Now Even More Powerful

BY MARTIN GITTINS

Macromedia's Flash, a Web-animation and interface-design program, has been instrumental in bringing the Web out of staid laboratories and into a Technicolor world of on-demand information, entertainment, and e-business. The program's rise has been meteoric, establishing the SWF file format as the de facto standard for streaming, interactive, animated Web content. In recent releases, Flash has also evolved from a mere animation tool into a powerful programming environment ideal for the creation of Web applications, user interfaces, games, and presentations.

With an emphasis on building dynamic, database-driven sites, the newest version, Flash MX, continues this trend. Flash MX is the first program in Macromedia's new, tightly integrated MX product line to be released; it offers an improved interface, new video support, OS X compatibility, and a host of powerful scripting tools that—when used in conjunction with the new Flash Player 6—produce leaner, and significantly meaner, Web sites.

The New Face of Flash

The ascent of Flash as a serious programming tool has left its users divided into two camps—those who use it primarily for design and animation and those who use it for programming. With Flash MX, Macromedia caters to both designers and developers; the program's tool enhancements and interface improvements are geared to each group's specific needs.

The most noticeable change in the program is its revised user interface. The mass of floating panels that cluttered previous versions has been condensed into dockable panels that you can expand, collapse, or hide—a tidy way of organizing and customizing your workspace.

Another significant interface improvement is the addition of

A Flashier Face Flash MX's user interface includes a context-sensitive Property Inspector and collapsible panels that help you keep your desktop tidy.

a Property Inspector feature similar to the one in Macromedia Dreamweaver. Property Inspector conveniently lists all the parameters for a selected tool or object in one place, thus reducing the total number of panels required for any one task. Click on a symbol, for example, and Property Inspector allows you to name the instance, set its position, or change the color effects. This alone will save a lot of time.

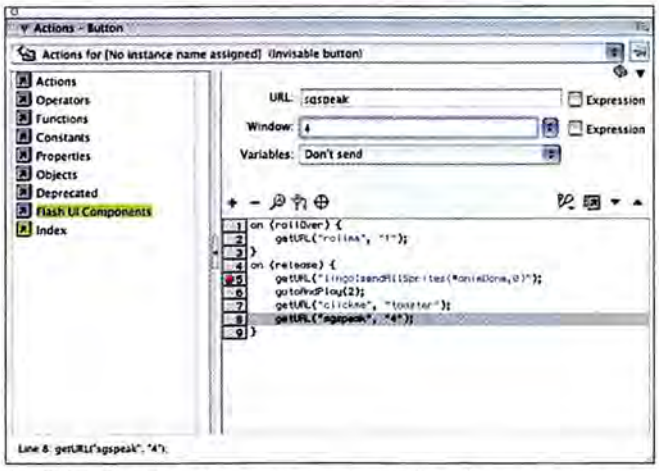
Flash's timeline has also received some fine-tuning. One of the most noteworthy additions is the ability to group layers together in folders for ease of management. Given that it's common for a simple animation to contain 30 or more layers, being able to organize, collapse, lock, and hide multiple layers at once by using folders is a real advantage. The new timeline also makes it easier to select multiple frames and to simultaneously manipulate objects from different layers.

Designer Details

Flash MX offers several new or refined tools geared specifically to the needs of designers, including a more robust color mixer, a new Free-Transform tool (which lets you scale, rotate, skew, and warp graphic elements), and improved integration with applications such as Adobe Illustrator and Macromedia FreeHand and Fireworks. For example, designers can import native FreeHand 10 files and preserve layers, text blocks, Library symbols, and pages.

Libraries—which store symbols—have also been improved; it's now easier to share common elements across a number of movies while keeping them up-to-date with any revisions. And you can import symbols directly into the Library, without first placing them on the stage.

With the introduction of Components, Macromedia has ensured that even the most code-shy user can harness the power of ActionScript, Flash's scripting language. Components, which replace the largely ignored SmartClips of version 5, are drag-and-drop behaviors that add functionality without requiring any scripting. For instance, you can create a scrolling-text window simply by dragging the scroll-bar Component onto a text field. Components are customizable, and they can be downloaded from Macromedia's community Web site (www.macromedia.com/exchange/).



Careful Coding The updated Actions panel now includes line numbering as well as debugging options such as breakpoints.

If anything has been left out, it's linear-animation enhancements; camera panning and zooming capabilities like those in the $374 animation program Toon Boom Studio (*Reviews*, March 2002) would have been welcome additions to Flash. However, you can use Toon Boom's free Flash MX importer to load your Toon Boom Studio projects into Flash MX.

Video Vitality

While Flash 5 supported linked QuickTime video, Flash MX lets you embed a variety of compressed-video formats directly into the SWF file for playback in Flash Player 6. This is achieved with the Sorenson Spark codec, which embeds the video file into the Flash movie as it's imported. Because this lets you integrate the video seamlessly into the rest of the movie environment, it's great for creating custom video players.

Flash MX also adds dynamic support for JPEG images (although it doesn't support progressive JPEGs) and MP3 audio; they can now be downloaded into the movie at runtime as the user requests them. This means that you can create an image-viewer application, for instance, that loads images from a database when they're needed, rather than requiring all of the images to be imported into a SWF file first.

Superior Scripting

For programmers who use Flash's ActionScript language to provide advanced interactivity (in Web applications, for example), there are lots of new enhancements—both to the scripting language and to the tools.

The ActionScript programming window has been overhauled, finally providing the proper coding environment that was sorely lacking in previous versions. It now offers colored syntax highlighting and code hinting (which offers a list of relevant parameters and events as you type code). And a Reference panel lets you quickly access more information about the correct syntax and parameters of a command.

Flash MX also adds an improved Debugger panel, which offers standard features such as breakpoints and code stepping to help track down and isolate errors in your script.

Unlike the last upgrade, this release has few new ActionScript commands, but operation has been improved in many of the existing ones—for instance, you'll find better handling of HTML tags such as lists. Under the surface, the new Object and Event model offers a more structured approach to scripting and makes ActionScript more like other languages, such as JavaScript. This also makes it easier to write code segments and generic functions that can be applied to other movies and projects, or even saved as Components and then shared with other developers.

Access for All

One of Flash's major weaknesses in the past was its inaccessibility—both to visually impaired viewers and to anyone who relied on the navigation conventions of Web browsers, such as bookmarking and the Back button. With Flash MX, Macromedia has responded on both counts. First, developers can now define frames as anchors, which viewers can use to navigate through a Flash movie via the browser's Forward and Back buttons or even bookmark.

Second, a new Accessibility panel lets designers add text descriptions, for use by screen readers, to every object—the Flash equivalent of adding **alt** tags to images in HTML pages.

Macworld's Buying Advice

For Flash developers looking to build sophisticated ActionScript-based Web sites, applications, or games, this upgrade is essential. While there are fewer reasons for designers to upgrade, plenty of enhancements—particularly the new user interface—make doing so worthwhile. □

RATING: ♦♦♦♦♦

PROS: Streamlined user interface; enhanced media and scripting support; faster playback.

CONS: Limited printed documentation; few new features for linear animation.

PRICE: $499; upgrade, $199

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Macromedia, 800/457-1774, www.macromedia.com

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800MHZ TITANIUM POWERBOOK G4

Smart Improvements Make High-End Laptop Shine

BY RICK LEPAGE

Many Mac users would like the PowerBook G4 to be a portable version of a desktop Power Mac, but buying a PowerBook has always meant trading some performance (and paying more) for portability. Now that equation has changed with the recent release of the 800MHz Titanium PowerBook G4, which goes a long way toward eliminating the performance gap that separates the desktop and portable worlds.

More Than a Speed Increase

Apple's two new PowerBook entries—the $3,199 800MHz model (which we tested) and the $2,499 667MHz model—boast a number of enhancements:

- a 133MHz system bus (previously, only the high-end 667MHz model had the faster bus);
- a 1MB Level 3 (L3) cache consisting of high-speed double data rate (DDR) RAM;
- a higher native resolution (1,280 by 854 pixels) on the same 15.2-inch display of previous models;
- a new ATI Mobility Radeon 7500 video chip with 32MB of DDR video RAM on an AGP 4× bus, for improved 2-D and 3-D graphics acceleration;
- a DVI-I connector, for hooking up an external digital flat-panel display;
- a DVD/CD-RW combo drive, which is now standard, as is Gigabit (10/100/1000BaseT) Ethernet and an analog sound-in port.

The 800MHz model ships with 512MB of RAM (with a maximum of 1GB supported), a 40GB hard drive, and a preinstalled AirPort card.

The Screen's the Scene

The PowerBook G4's look and weight is identical to its predecessors, but once it's powered up, you can see the first of Apple's improvements. The screen is brighter than that of the previous PowerBook G4's, and the higher resolution gives it a crisper, cleaner look with a high degree of readability.

While the PowerBook's screen supports resolutions as high as 1,280 by 854 pixels, the laptop will drive an external display as high as 2,048 by 1,536 pixels in 24-bit color. Using Apple's new DVI to ADC Adapter, we connected our PowerBook to the expansive 23-inch Cinema Display without problems.

Desktop Power

The screen is the most obvious external improvement, but Apple focused most of its effort under the hood. The 800MHz PowerPC chip is a good start, but it's the L3 cache and overhauled video subsystem that truly push the PowerBook's performance.

Apple put a 2MB L3 cache into the 933MHz and dual-1GHz Power Macs it released in January (see "The Fast Crowd," May 2002). And as was the case with those machines, the L3 cache—speedy RAM that helps the processor work more efficiently during data-intensive tasks—gives this PowerBook G4 definite speed benefits (see "Closing the Laptop Gap").

For example, the 800MHz PowerBook performed our Photoshop Suite test, which runs a series of processor-intensive operations on a 50MB image, in 36 seconds—nearly as fast as the entry-level 800MHz desktop and 10 seconds faster than the older 667MHz PowerBook. MP3 encoding, another heavy computing task, was 8 seconds faster on the 800MHz PowerBook than it was on the 800MHz desktop.

Graphics display performance is also very good. ATI's Mobility Radeon 7500 chip makes an excellent base, upon which Apple doubled the previous complement of high-speed DDR video RAM (to 32MB). The result is quicker, smoother scrolling, faster game play, and an all-around snappier system—once again on par with comparable desktop systems (which have more-powerful graphics cards). Scrolling through a 34-page PDF, which took nearly 3 minutes on the earlier 667MHz PowerBook, took only 1 minute and 45 seconds on the 800MHz model—4 seconds faster than our 800MHz desktop. In our Quake test, the 800MHz PowerBook clocked in at an unbelievable (for a portable) 71 frames per second.

Impressive Details

While performance is the big story, Apple also tinkered in other areas, answering a few complaints raised by owners of previous Titanium PowerBooks. Apple says that it has improved the PowerBook's AirPort reception; while we ran into fewer dead zones on wireless networks with the new PowerBook than with the older models, reception still wasn't as strong as with an iBook.

This PowerBook is very quiet: over a week of solid testing, its

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Closing the Laptop Gap

Macworld LAB TEST

	Speedmark 3.1	Adobe Photoshop 6.0.1	iMovie 2.1.1	iTunes 2.0.3	Quake III v1.30b1
	OVERALL SCORE	SUITE	RENDER	MP3 ENCODE	NORMAL
Apple PowerBook G4/800	164	36	54	51	71
Apple PowerBook G4/667 (previous model)	*129*	*46*	*74*	*75*	*51*
Apple Power Mac G4/800	*161*	*35*	*58*	*59*	*66*
	>Better	<Better	<Better	<Better	>Better

BEST RESULTS IN **BOLD**. REFERENCE SYSTEM IN *ITALICS*.

Speedmark scores are relative to those of a 500MHz iMac (Flower Power), which is assigned a score of 100. Photoshop, iMovie, and iTunes scores are in seconds. Quake scores are in frames per second. The 800MHz Titanium PowerBook G4 ships with 512MB of RAM and requires OS X 10.1.4. We tested each reference system with OS X 10.1.2 installed and 512MB of RAM. We set displays to 1,024-by-768-pixel resolution and 24-bit color. The Photoshop Suite test (which runs in the Classic environment) is a set of five scripted tasks using a 50MB file. Photoshop's memory partition was set to 200MB and History was set to Minimum. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long, converting it from the hard drive using iTunes' Better Quality setting of 160 Kbps. We tested Quake III at a resolution of 640 by 480 pixels with graphics set to Normal. For more information on Speedmark, visit www.macworld.com/speedmark.—MACWORLD LAB TESTING BY RICK LEPAGE AND JAMES GALBRAITH

RATING: ★★★★½

PROS: Great overall performance for a portable; increased screen resolution and brightness; wide array of external video options; runs quietly.

CONS: AirPort reception still not as strong as other Apple portables.

PRICE: $3,199

OS COMPATIBILITY: Mac OS 9, Mac OS X

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

COMBUSTION 2

Compositing and Rotoscoping Software Provides Amazing Tools, Innovative Interface

BY BEN LONG

If you're a video professional who uses Adobe After Effects, at one time or another you've probably longed for the power of a high-end compositing system such as Discreet's Inferno or Flame. Combustion 2, Discreet's first major upgrade to its low-end compositing and rotoscoping system for video and film, should ease some of that longing.

Although Combustion is Discreet's entry-level product, it's an incredibly powerful tool built around the same technology as the company's higher-end packages. At $4,995, Combustion costs nearly twice as much as its chief competitors, Adobe After Effects and Pinnacle's Commotion, but it offers color-correction and painting features far beyond those of lower-priced packages. With version 2, Discreet has added new text and particle-generation features, which make the package even more enticing. And because it can exchange data with Discreet's high-end systems, Combustion 2 can serve as a great low-cost additional workstation for post houses that already have Flame, Flint, or Inferno.

No Windows, No Menus

With Combustion, Discreet eschews almost all of the Mac's interface standards in favor of a derivation of the interface it uses in its higher-end compositors. The result is an extraordinary working environment that runs in either OS 9 or OS X. Once you get used to Combustion's interface, it's hard to go back to other compositing programs.

Combustion has no windows. The entire screen (below the menu bar) is filled with dark gray, to ease color perception. The top half shows your video (or several different views of your video), and the bottom half is a well-organized collection of context-sensitive buttons and tabbed palettes.

There's more that makes Combustion's interface so inviting. First, all functions are context-sensitive—that is, the program displays only tools and options relevant to your current action. While other software companies have tried to create similar environments, Discreet has succeeded—Combustion's elegant interface design never makes you feel cut off from the rest of your tools.

Second (and as in After Effects), all buttons and fields are *scrubbable*, so you can move your mouse back and forth over a control or field to change its value and watch the screen update in real time. This is an outstanding feature for making changes to a single axis of rotation or position.

In general, Combustion's interface is striking for how little mousing you have to do—the right control always seems to be where you need it.

The only downside to such a different interface is that it can take a day or two to recognize the visual cues that help you understand the organization and relationships of features, but once you do, other compositing packages will seem cumbersome and overly complex.

Compositing and Painting

Combustion can import all major video and graphics formats, and it provides as many as 16 bits per color channel, making it suitable for film work. Like most compositing programs, Combustion separates a project into layers. Each layer in turn can hold video clips, still images, painting information, and other layers. And by providing a workspace palette in the bottom of the screen, the program makes it easy to manage layers.

Combustion allows for both 2-D and 3-D compositing, letting you position objects in true 3-D space and giving you full control over reflections and shadows.

Color Aflame Combustion's excellent color-correction features include a unique interface, a full assortment of tools, and powerful color-matching capabilities.

The program also includes the same powerful keying technology as Discreet's higher-end apps, as well as sophisticated vector masking tools that allow for the creation of complex gradient masks.

It also includes a vector paint facility, with shapes, brushes, Bézier tools, and more, and all shapes and paint strokes remain fully editable. Combustion takes a different approach to cloning (a staple function of rotoscoping and compositing). Instead of the single, brush-like cloning tool found in most painting programs, Combustion has many—any shape can be a cloner. For example, you can draw a vector shape and tell Combustion to clone its contents from somewhere else in your image (or from an entirely different frame).

In Combustion, you perform all editing operations by applying the appropriate type of operator to your media. For example, when you want to paint into a piece of video, you apply a paint operator to that clip. In the workspace window, you can see each operator attached to its piece of video. Combustion applies all of the operators on-the-fly when it renders its images to the screen. Because *all* functions—color correcting, painting, effects filters, character generation, making selections—are applied as operators, you can easily deactivate, remove, edit, or reorder *any* of the actions that you've performed on your media. This is incredibly powerful and provides tremendous creative freedom.

Color Correction and Motion Tracking

Discreet has also included its high-end color-correction and motion-tracking tools in Combustion. The motion tracker is first-rate, delivering rock-solid image stabilization, as well as motion tracks with subpixel accuracy. And although Combustion allows you to import or export motion-tracking data to a file for later use, we'd prefer a more convenient mechanism for easily storing data within the project file, à la Commotion's Motion Tracking palette.

Combustion's color-correction tools offer all the controls you'd expect to find in an image-editing program, as well as excellent color matching—

> continues on page 42

RATING: ★★★★½
PROS: Excellent interface; great color-correction, motion-tracking, and keying tools; well-designed paint system.
CONS: Interface may take a few days to learn.
PRICE: $4,995
OS COMPATIBILITY: Mac OS 9, Mac OS X
COMPANY: Discreet, 800/869-3504, www.discreet.com.

DIGITAL-ASSET MANAGERS

Cumulus 5.5 and Portfolio 6 Make Organizing Files Painless and Finish Neck and Neck—Again

BY BRUCE FRASER

Digital-asset management has become something of a buzz word in publishing circles over the last couple years. A digital asset is simply a file that you may want to reuse, be it a photo, movie, audio clip, illustration, article, or page layout. As with every large collection, most people will need a way to organize it. Digital-asset managers Cumulus 5.5, from Canto, and Portfolio 6, from Extensis, provide such a system by going beyond Apple's iPhoto and even Adobe Photoshop 7.0's File Browser, letting you find the files you need exactly when you need them. Available in editions for single users (reviewed here), workgroups, or even large companies, digital-asset managers are a boon for publishing companies and creative pros who must organize many types of digital assets.

Uncanny Similarities

Cumulus and Portfolio have broadly similar interfaces. Neither is Mac OS X native, but both run as well in OS X's Classic mode as they do in OS 9. Each file in the catalog is represented by a thumbnail—useful for previewing images and illustrations—and by various fields that store file information, such as keywords and a file's location on your disk. Cumulus gives you all the information at a glance, while Portfolio's main window has three tabbed panels that divide the information into subcategories. You can browse thumbnails, or you can use a Sherlock-like interface to search (see "At Your Fingertips").

When we put these two programs side by side, we found that Portfolio seems aimed at a less-technical user than Cumulus, but it also offers some user-friendly features that put it ahead of Cumulus. For example, Portfolio includes a utility called Portfolio Express, which acts as a floating palette inside other applications and lets you drag and drop assets into Portfolio even when Portfolio isn't running. Cumulus's Palette View mode offers similar functionality, but Cumulus must be running for it to work, and it doesn't float above other apps the way Portfolio Express does.

Building Your Catalog

You can build catalogs in both Cumulus and Portfolio, either by letting the software scan selected files, folders, or volumes for assets or by dragging and dropping files from the Finder to the catalog window. But while it's tempting to dive in and hope that the application will do the work for you, both applications need some setting up to behave optimally. Before you start cataloging everything on your Mac, you may want to read the manuals for these products, both of which are comprehensive and come in printed form.

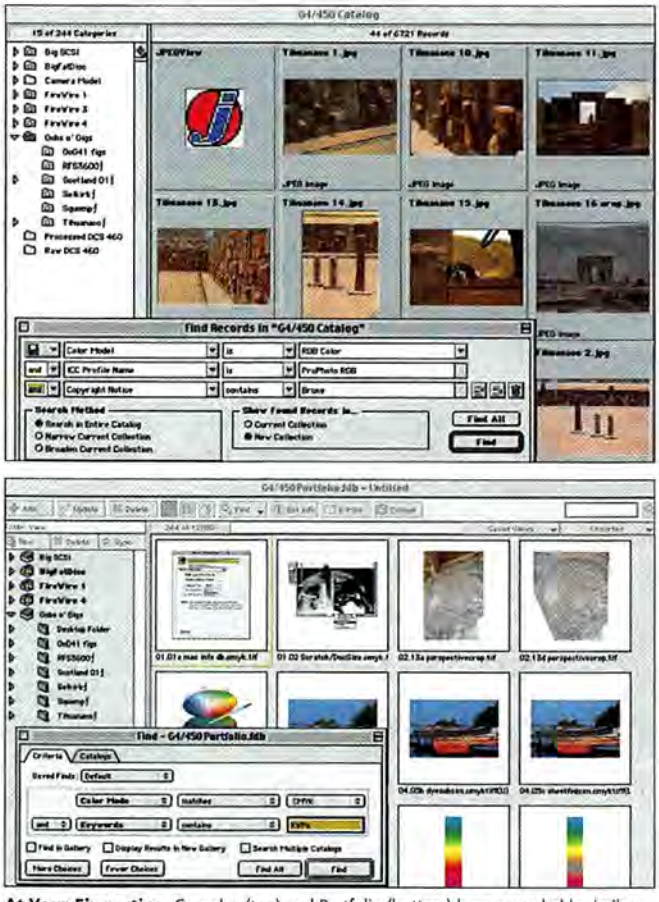
Then you'll need to figure out which kinds of files you need the application to capture, and you must tell the app which metadata—data about the files, contained *within* the files—you want indexed for speedy searching later. Capturing more data slows the cataloging process and makes the catalog larger but gives you more ways to find the exact file you want once they're all cataloged.

Cataloging is a lengthy, but automatic, process. The time it takes to build a catalog depends on the speed of your Mac, the size of your hard drive, the types of assets you're cataloging, and the amount of information you want to extract from each one. Portfolio is faster at building catalogs of digital assets than Cumulus is, but it captures fewer types of metadata and has fewer configuration options. In either program, if you're cataloging 10,000 files that take up 15GB to 20GB, think in terms of hours rather than minutes. And that's why you're better off planning ahead: if you decide later that you want to capture a data type you hadn't specified, you can update the catalog—but that, too, is quite time-consuming.

Working with Catalogs

Both Cumulus and Portfolio adopt the Finder's folder and subfolder structure as part of their catalogs, but in rather different ways. Cumulus presents a window showing the thumbnails, with a category viewer at the left. By default, Cumulus creates categories based on path names—the volume and its subfolders—so if you've already organized your files into folders and subfolders, that organization is preserved. You can click on a volume, folder, or subfolder icon to find all the files it contains. Portfolio's approach is a bit more cumbersome. It, too, assigns categories by path and works in a way similar to Cumulus, but Portfolio's categories appear in a separate palette.

It's important to note that the categories in both applications, though based on paths at the time of cataloging, don't have any live connection to the location of your files and folders. If you move or delete files in the Finder, you must update the catalog to make the categories reflect the changes. To compensate for this, Portfolio has a feature called FolderSync, which lets you view the actual files and folders in a column to the left of the catalog. Clicking on the FolderSync button updates this structure to reflect changes you've made in the Finder, and you can use



At Your Fingertips Cumulus (top) and Portfolio (bottom) have remarkably similar Find functions that capture the results in a new collection you can save for future use.

FolderSync to actually move and delete files. FolderSync is a powerful tool, but having two separate interfaces—FolderSync and the Finder—that let you copy, move, and delete files can be unsettling.

Classified, Categorized Information

To fully harness the power of either Cumulus or Portfolio, you need to know a little about metadata, and you must spend time assigning keywords to your assets. Metadata standards, such as the EXIF (Exchangeable Image File) standard and the older IPTC (International Press and Telecommunications Council) standard, let you store information ranging from caption, byline, copyright holder, and transmission instructions, to camera model, compression options, shutter speed, and image orientation, right in the image file.

You can use these pieces of information in many ways—you may want to find all images that need rotation, all images shot with a particular camera model, or all images that belong to a specified copyright holder, for example. (Other file types contain metadata too—for example, MP3 files can contain technical information about the sampling and compression rate, as well as information about the artist and album.) What makes metadata so nifty is that it's already contained in the file, so the digital-asset manager can capture it easily.

Metadata is a great tool, but if you need to find all the images you shot in South America that contain birds, or all the MP3s that are songs by all-female punk bands, for example, you need to assign keywords to the catalog entries by hand.

Using Cumulus's Categories feature is a speedy way to classify files. While the default categories are based on the volume structure, you can define categories and subcategories that appear as folders and subfolders. Dragging a group of assets from the catalog onto a category icon associates that category with the assets.

Portfolio's implementation of its Categories feature is less obvious; you must arrange the catalog hierarchy manually, first creating a category and then dragging it into an existing category to turn the one you created into a subcategory. Cumulus, on the other hand, lets you simply select a category and create a subcategory within it.

Portfolio places more emphasis on user-defined keywords. To assign keywords to assets in Portfolio, you must select the assets, then use a text-entry field to add keywords, which in comparison, is less convenient.

Macworld's Buying Advice

Like the previous versions of these products (*Reviews*, October 2000), Cumulus 5.5 and Portfolio 6 are equally fine programs, so if you're looking for a time-saving way to find and use your various digital assets, either will serve you well. Portfolio is especially well suited to users who don't need extensive metadata support and who are willing to pay twice as much for the convenience of Portfolio Express. But if you need to capture more metadata from your files, such as the ICC profile embedded in images or the number of layers in an InDesign file, Cumulus delivers an industrial-strength solution that is remarkably easy to use. □

CUMULUS 5.5 SINGLE USER EDITION
RATING: ♦♦♦♦
PROS: Supports many metadata types; easy to use.
CONS: Not OS X native; supports fewer asset types than Portfolio.
PRICE: $100
OS COMPATIBILITY: Mac OS 9
COMPANY: Canto Software, www.canto.com, 415/703-9800

PORTFOLIO 6
RATING: ♦♦♦♦
PROS: Allows file management from within Portfolio; cataloging through context-sensitive menu when Portfolio isn't running.
CONS: Not OS X native; supports fewer metadata types than Cumulus.
PRICE: $200
OS COMPATIBILITY: Mac OS 9
COMPANY: Extensis, www.extensis.com, 800/796-9798

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WIRELESS BROADBAND ROUTERS

AirPort Alternatives Provide Shared Internet Access to Wireless and Wired Macs

The Netgear MR-314 Cable/DSL Wireless Router

BY SHELLY BRISBIN

Although Apple's $299 AirPort Base Station provides wireless networking capabilities and routing in a stylish and shapely package (*Reviews*, April 2002), it's hardly the only option when it comes to setting up wireless networks. For as little as half the cost of the Base Station, you can buy an AirPort-compatible wireless router that offers most of the AirPort Base Station's features (and in some cases, even more). While a few of the seven wireless routers in this roundup aren't particularly easy to set up from a die-hard Mac user's perspective, others provide a solid set of features at a price that rivals AirPort's.

The Lineup

Macworld Lab tested seven Mac-compatible wireless broadband routers that use the same IEEE 802.11b technology (which Apple calls AirPort and other companies call Wi-Fi) found in Apple's AirPort cards and Base Station: Agere Systems' Orinoco BG-2000, Belkin's Wireless Cable/DSL Gateway Router F5D6230-3, Buffalo's AirStation WLAR-L11G-L, D-Link's D-Link Air DI-714 Wireless Gateway, Linksys's EtherFast Wireless AP + Cable/DSL Router BEFW11S4, Netgear's MR-314 Cable/DSL Wireless Router, and Zoom's ZoomAir IG-4165.

All the products we tested support a broadband Internet connection over Ethernet, have a Web-browser–based administration interface for initial setup and maintenance, and include 128-bit WEP (Wired Equivalent Privacy) encryption and Network Address Translation (NAT). They also support PPPoE (Point-to-Point Protocol over Ethernet), which is required by some broadband service providers. And although they don't include built-in modems, as the AirPort Base Station does, the D-Link and Zoom routers facilitate dial-up Internet access by including a serial modem port for an external 56K modem.

Each router in this review also includes a DHCP server that provides IP addresses to wired and wireless clients when they join the network, giving each a local network identity and access to the Internet. All but the Orinoco BG-2000 include two to four switched 10/100BaseT Ethernet ports you can use to connect wired computers or printers directly to the router, providing dedicated bandwidth for the computer or printer connected to it and thus increasing network speed.

If you want to use AppleTalk to print from a wireless computer, your choices narrow to the four products we tested that provide AppleTalk routing for both wired and wireless Macs: the Orinoco, the AirStation, the MR-314, and the ZoomAir.

Router Setup

We set up each of our seven wireless routers with little trouble, but most hiccuped once or twice. We connected each router to the Internet via a DSL modem and to a local network consisting of a Power Mac G4 with an Apple AirPort card running Mac OS X 10.1.3; a PowerBook G3 with a Lucent Orinoco Silver PC card running Mac OS 9; and two wired computers, a desktop Power Mac and a Dell PC running Windows 2000. We tested PPPoE features on a different network featuring a wired Mac, a wireless PC, and the wireless PowerBook G3.

To get a wireless router up and running, you first connect the router to your cable, DSL, or dial-up modem and then connect a Mac to the router via an Ethernet cable for the initial configura-

Wireless Broadband Routers Compared

COMPANY	PRODUCT	MOUSE RATING	PRICE	CONTACT	APPLETALK SUPPORT	MODEM PORT	BUILT-IN ETHERNET SWITCH	PROS	CONS
Agere Systems	Orinoco BG-2000	3.5 mice	$170	610/712-6011, www.orinocowireless.com	yes	no	none	Excellent access and admin control features; good business-oriented management features; support for terminal and SNMP administration; log file can be exported.	Only one Ethernet LAN port; "shark fin" design makes device prone to toppling over.
Belkin	Wireless Cable/DSL Gateway Router F5D6230-3	2.5 mice	$165	800/223-5546, www.belkin.com	no	no	3 ports	Well-designed setup wizard; good admin and access control.	Somewhat unreliable; firmware upgrade failed; no AppleTalk support; no Mac documentation.
Buffalo	AirStation WLAR-L11G-L	2 mice	$165	800/456-9799, www.buffalotech.com	yes	no	4 ports	Includes Mac-specific (including OS X) documentation.	Inscrutable documentation; poorly organized admin interface; no tech-support contact information provided.
D-Link	D-Link Air DI-714 Wireless Gateway	3.5 mice	$170	800/326-1688, www.dlink.com	no	yes	4 ports	Very thorough setup and documentation; well-designed setup wizard; extensive VPN support.	Encryption is supported but omitted from documentation; no Mac setup instructions.
Linksys	EtherFast Wireless AP + Cable/DSL Router BEFW11S4	3.5 mice	$170	800/546-5797, www.linksys.com	no	no	4 ports	Basic online help easily accessible via Web admin interface.	No AppleTalk support.
Netgear	MR-314 Cable/DSL Wireless Router	4 mice	$160	408/907-8000, www.netgear.com	yes	no	4 ports	Excellent value; AppleTalk support; good access-control features.	No Mac wireless-driver setup instructions.
Zoom	ZoomAir IG-4165	4 mice	$200	561/241-4371, www.zoom.com	yes	yes	2 ports	Dial-up modem support; AppleTalk support; fast admin interface.	Homely admin interface.

tion. Next, you'll need to configure TCP/IP on that Mac, locate the router's IP address, and enter it into a Web-browser interface to reach the administration interface. Once you've finished choosing administrative options in a browser, you'll need to set up a client driver (usually AirPort software) for each wireless Mac.

If you haven't configured TCP/IP settings before, you won't get much help from the documentation provided with most of these routers: the instructions are generally geared toward Windows users. To their credit, Netgear, Agere, and Buffalo offer Mac TCP/IP setup instructions, while Belkin and Zoom avoid the issue by giving general setup information and referring users to their computers' documentation. D-Link and Linksys provide Windows-specific instructions that Mac users who have experience setting up TCP/IP should be able to interpret. Only Buffalo's documentation provides Mac configuration instructions for configuring TCP/IP and AirPort settings in OS 9 and OS X, though it's poorly written.

Then you'll need to connect the administrator Mac to the router via a Web browser and begin the process of setting networking and wireless options: though the options themselves are the same in most products, the ease of configuration varied widely among the routers we tested. Belkin and D-Link use browser-based setup-wizard interfaces to walk you through configuration, making it easy to follow and refer back to your settings. The least intuitive interface belongs to the Buffalo AirStation; its cluttered series of screens feature error messages badly translated into English, and it provides no guidance on choosing settings specific to the kind of Internet connection you're using. Though all of the routers' Web interfaces offer some online help, Agere does the best job of integrating it into the setup pages themselves.

Making (and Keeping) the Connection

When we set up the Belkin router, we noticed that it would periodically lose its Internet connection. Belkin's tech support suggested a firmware upgrade, which, we were told, would have to be done from OS 9. The upgrade was not successful, even when we repeated the process on a Windows 2000 machine. By contrast, our upgrade of Netgear's firmware from a Mac running OS X was successful.

In terms of ongoing router management, the Orinoco is an innovator, with several features that will appeal to business users, such as a choice of Web, terminal, or SNMP access, as well as the ability to create different configuration profiles for the router that can be used when the router is moved. You can also export the Orinoco's system-log file, a feature you'll find in the MR-314 router as well.

Security

Wireless security has been a hot topic ever since security experts broke the WEP encryption scheme in mid-2001. WEP will remain the standard means of securing a wireless network until the IEEE ratifies an improved technology, and the routers we tested do include security mechanisms you can use to limit access. For instance, all the routers we tested provide MAC (Media Access Control) address control, allowing you to enable access to your network only for machines with known MAC addresses.

The routers we tested also include firewalls that prevent access from outside your network to clients on your local network. But if you *want* outsiders to be able to access the network, in the case of Web servers or other types of remote servers, all allow for a virtual server (also called *port forwarding*) that exposes one or more ports that you specify to the outside world. Netgear and Zoom shine in this category, providing a convenient list of popular port types that you can use to create a virtual server.

If you need to access files or download e-mail at home from your office network, VPN support may be a prerequisite for making a connection. If your company uses a VPN, you'll need a router that supports it. The routers in our roundup from Agere Systems, D-Link, Linksys, Zoom, and Netgear support VPN pass-through using IPsec, the standard VPN protocol. Check with your system administrator to find out which type of VPN support you need.

Macworld's Buying Advice

Apple's AirPort Base Station offers a few key features that you won't find in any of the seven routers we tested: A built-in modem, AOL support, and Mac-specific documentation. If you require any of those features, the AirPort is your best bet. But if you can forgo those options or if you need VPN support or multiple switched Ethernet ports, one of the routers in this review will most likely serve you better—and at a lower price.

We highly recommend the Netgear MR-314 Cable/DSL Wireless Router, for its welcome Mac-friendliness, excellent admin interface, and great price. The Zoom ZoomAir IG-4165, with AppleTalk support, Mac-specific documentation, and its two-port Ethernet switch, comes close to (and sometimes outdoes) the AirPort Base Station in features, and it costs $100 less. □

A Guide to the Wireless Alphabet Soup

All the wireless routers in our review, along with Apple's AirPort, adhere to the IEEE (Institute of Electrical and Electronics Engineers, pronounced "I triple E") 802.11b standard, a radio-based protocol operating in the 2.4GHz frequency band (the same band used by microwave ovens). **802.11b** is the leading wireless-LAN standard today, but there are others, both IEEE follow-ups and technologies being promoted by other industry groups.

The 802.11b offerings have come to be known as Wi-Fi (you'll see a Wi-Fi certification logo on many wireless products). True Wi-Fi products have been certified by WECA (the Wireless Ethernet Compatibility Alliance) as being compliant with the IEEE standard.

Here's a brief look at some of the wireless standards coming our way—and where they're going.

- **802.11a** signals can travel at the blazingly fast speed of 54 Mbps, albeit at a much shorter range than 802.11b. But because 802.11a operates in the uncluttered 5GHz band, it's much less susceptible to interference from the multitude of 2.4GHz devices, such as cordless phones and wireless security systems. Though some companies, including D-Link, Netgear, and Proxim, already offer 802.11a products, they're currently incompatible with 802.11b networks.
- **802.11g** is a high-speed version of 802.11b that operates in the same 2.4GHz band at speeds as fast as 54 Mbps and has a range nearly as good as 802.11b's: hundreds of feet. However, despite achieving 802.11a's speed with a much further reach, 802.11g probably won't be ratified by the IEEE until the middle of next year, which means companies are not building products that use it. Still, many industry observers believe that 802.11g will eventually supplant 802.11a, because it offers backward compatibility with 802.11b products.
- Supporting standards for security (**802.11i**), spectrum management (**802.11h**), and quality of service (**802.11e**) are also working their way toward ratification and will probably be integrated into wireless products in the next two years. These subsidiary standards will enhance Wi-Fi capabilities by working over whatever standard you use, 802.11a, -b, or -g.
- Touted as a networking technology before 802.11b emerged, **Bluetooth** was held back by its short range. Like 802.11b and 802.11g, Bluetooth operates in the 2.4GHz radio band. Both Apple and Microsoft have begun promoting the technology as a way to wirelessly connect PDAs, keyboards, monitors, and other peripherals to computers, but Bluetooth's severe range limitations make it impractical for creating wireless networks.
- Before 802.11b there was **HomeRF**, a 2 Mbps 2.4GHz standard that competed with 802.11b. But the radio-based standard, which was once championed by Intel, has largely gone the way of the dinosaur, mainly because it can't match the speed or range of 802.11b. No Mac-friendly HomeRF products are available.

LIVEMOTION 2.0

Adobe's Interactive Web-Animation Tool Adds Scripting Power but Fails to Catch Flash

When Adobe first released LiveMotion 1.0 (*Reviews*, September 2000), a program for designing interactive Web animations, it marketed the application as a simplified approach to creating SWF content. LiveMotion lacked the scripting power of its rival, Macromedia Flash, but offered an interface that many designers already felt comfortable with.

With the release of LiveMotion 2.0, Adobe hopes to broaden the program's scope. Thanks to the addition of robust scripting tools, OS X compatibility, and a long list of enhancements, version 2.0 is at last a mature program—even if it's still playing catch-up to Flash.

Script Show LiveMotion's new Script Editor finally makes the program a worthy challenger to Flash.

Adobe Integration

LiveMotion's ace in the hole has always been its tight integration with the rest of the Adobe suite. The new version builds on this strength by adding support for layer sets in native Photoshop 6 and Illustrator 9 and 10 files. After you've imported your PSD file, LiveMotion gives you the option of converting nested layers into separate objects, groups, or an animation sequence. And as with version 1.0, these objects can automatically update in LiveMotion when changes are made to the source file.

LiveMotion's timeline now bears a closer resemblance to the one in After Effects. For example, it offers the ability to hide, shy, and lock objects, making it easier to organize and navigate a complex timeline. And by using the AMX export option in After Effects 5.5, users can import After Effects compositions directly into LiveMotion 2.0. This is great for video pros who want to output their files to the Web.

Capitalizing on the fact that its timeline is measured in seconds—not frames, as in Flash—LiveMotion 2.0 also makes good use of another After Effects feature: time stretching. You can now speed up and slow down animations simply by dragging their endpoints in the timeline. All the keyframes adjust to match the new pacing.

Drawing Tools

In addition to creating the space-efficient vectors that the SWF file format is famous for, LiveMotion excels at creating and editing bitmaps—something Flash doesn't do. For example, you can use a style from the Styles palette to apply effects such as textures and drop shadows to objects. Text handling is improved in LiveMotion 2.0; it uses the same type engine as Photoshop 6. Users of previous versions will be happy to note that the program no longer exports text as vector paths, which seriously bloated files in version 1.0. And LiveMotion 2.0 lets you zoom out past the actual size of the canvas.

Alas, LiveMotion still lacks an automated bitmap tracer for converting bitmaps into Web-friendly vectors. And the program still doesn't offer native shape-tweening capabilities, although there are some convincing workarounds.

Scripting Tools

To replace LiveMotion 1.0's abysmal script engine, Adobe added badly needed scripting support through a JavaScript-based implementation of ActionScript (the scripting language of Flash) to LiveMotion 2.0. This makes it possible to build simple navigation, as well as complex Web applications, games, and other interactive content—basically, anything you can do in Flash 5. (LiveMotion 2.0 doesn't support the new ActionScript capabilities in the recently announced Flash MX and Flash Player 6.)

LiveMotion 2.0's script editor features a structured approach to script writing—including syntax color-coding—while a debugging utility helps to track down scripting errors. Applying scripts in LiveMotion is conceptually very different from the way it's done in Flash, but it is elegantly implemented. An excellent scripting guide helps you master the basics.

> continues on page 42

RATING: ♦♦♦♦

PROS: Superb Adobe integration; excellent timeline animation features; support for ActionScript.

CONS: Difficult to script; no free-hand drawing tools; no shape tweening.

PRICE: $399; upgrade, $99; GoLive/LiveMotion Pack, $499

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Adobe, 800/833-6687, www.adobe.com

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UNIVERSE 4

3-D–Rendering Speed Demon Has Major Improvements but Is Short on Documentation

BY MATTHEW LOWRIE

Electric Image's Animation System has matured far beyond its former peers (notably MacroMind's MacroModel and RayDream's self-titled RayDream) and emerged as one of the fastest film-quality renderers on the market. Electric Image's latest release, the OS X–native Universe 4, has improved its character-animation tools, and the program now includes Global Illumination light objects, among other enhancements. But as powerful as Universe is, it comes with poor documentation, and its interface is inconsistent, making it manageable for advanced 3-D artists but challenging for many beginning and intermediate users.

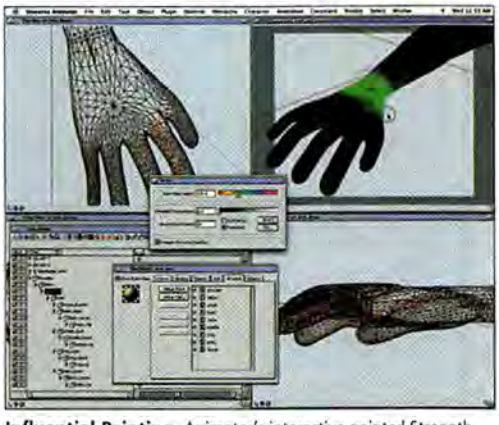
Three Apps for Three Processes

Universe 4 has three separate applications for modeling, animating, and rendering: Universe Modeler, Universe Animator, and Universe Camera. Modeler is built from the ACIS code library, which is entirely curve-based. Artists accustomed to polygonal modeling may find the terminology awkward at first, but Modeler includes familiar operations such as Booleans, sweeps, and revolves. Animator provides the world environment for texturing and animating imported models.

Camera is an independent ray-tracing renderer that generates the final output files of scenes created in Animator. That the rendering process is part of a separate application contributes to Universe's fast rendering speed.

One Interface for Two OSs

Universe 4 includes OS 9 and OS X versions. But Aqua fans will be disappointed—there's no visual difference between these two versions. Some 3-D users will prefer this for efficiency's sake, though, as Universe's custom window title bars take up less screen real estate than those of Mac OS's interface.



Influential Painting Animator's interactive painted Strength Maps give real-time feedback about bone influence on characters.

Modeler and Animator have similar interfaces, but there are usability inconsistencies between the two programs. For example, Modeler's keyboard shortcuts for viewport navigation and Move, Rotate, and Scale tool selection are different from Animator's—switching between the two can get confusing. And Modeler's lack of keyboard shortcuts for tools forces you to select them from the tool palette.

Characters Get Some Support

Universe 4's major improvements appear in the Animator application; they include cubic reflection maps, blur previews, and a real-time constraint system. The biggest addition is Animator's enhanced set of character-animation tools. The new, single-step process for binding models to bone hierarchies treats the binding as a dependency. A bone hierarchy can control multiple skins and no longer has to be a child of the model it's affecting.

Strength Maps now handle bone influence on vertices. You can create Strength Maps in two ways: by using an image's luminance value to set the weighting of bone influence or by using an interactive brush to paint strength values directly onto the skin within Animator. The new painting feature is very flexible: vertex positions are updated in real time within viewports as you paint. The program also lets you enable the painting mode in all viewports, giving you access to all sides of the model in the wireframe or shaded view.

Electric Image has enhanced rendering in Universe 4 by adding Global Illumination light objects, which let you create a random array of lights that point toward a single area, or stage, simulating natural light on objects. The rendering is on a par with that of LightWave 3D's radiosity with Global Illumination, but because Universe uses ray tracing to do this, it renders five to six times faster.

Caution When Modeling

Nearly a decade after Electric Image first developed a Mac application, it introduced Modeler, which has an assortment of features, some in need of fine-tuning. There are several tools for creating and editing NURBS curves and for generating solid or surface bodies from those curves. But as you use these tools in a project, they usually yield a cryptic ACIS-incompatibility warning message, which, frustratingly, forces you to replan your modeling strategy.

The surface-subdivision mode, UberNURBS, is great for creating smooth, organic shapes and has a broad selection of cage-editing and vertex-influence tools. Modeler also includes interactive rounding and beveling tools that rival those of Autodessys's FormZ—if only they worked as precisely. Modeler's rounding technique worked well on primitive shapes, but it didn't do so well on complex edges of extruded objects because Modeler had trouble with calculations.

All shapes created within Modeler are ACIS bodies, so you'll need to tessellate them into a polygonal model before importing them into Animator. But be prepared for the time-consuming, trial-and-error process of finding tessellation settings that balance broadcast smoothness with geometric size.

Deficient Documentation

Because Universe's documentation is still inadequate, the program is frustrating to learn if you're a beginning or even an intermediate 3-D artist. Typos aside, the documentation doesn't mention that some features may not always perform as expected, so it's difficult to troubleshoot. Luckily, users have access to support from an online community at Postforum (www.postforum.com) and DVGarage (www.dvgarage.com), as well as from the mailing list at Toolfarm.com.

Macworld's Buying Advice

Universe 4 maintains Electric Image's commitment to fast, high-quality rendering, and its new character-animation tools broaden the program's abilities beyond animating architectural fly-throughs, flying logos, and space battles. 3-D artists will have to spend a lot of time ironing out the suite's idiosyncrasies; however, the improvements in Universe 4 make it comparable to competitors that cost more. □

RATING: ♦♦♦½

PROS: Fast ray-tracing renderer; film-quality rendering; simple but powerful Global Illumination and character-animation tools.

CONS: Dissimilar interface conventions between apps; finicky Modeler application; weak documentation.

PRICE: $995; upgrade from version 3.X, $349; upgrade from Animation System 1.X and 2.X, $449

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Electric Image, 949/481-6660, www.electricimage.com

QX-TOOLS PRO

XTensions Provide Limited Value to XPress Users

Extensis's QX-Tools Pro, a collection of 12 XTensions for QuarkXPress 4 and 5, can be extremely useful for dabblers and pros alike, but its practicality depends on the version of XPress you have, the XTensions you're already using, and the nature of your XPress work.

Clutter Management QX-Tools Pro lets you either use its palettes separately or dock them together to keep your screen tidy.

Three new components in QX-Tools give the program its Pro status. The new Import component converts Microsoft Excel or PowerPoint files into EPS files and imports them into XPress. One problem with this feature is that it doesn't convert Microsoft Word or Excel tables into native QuarkXPress tables. And if you seldom import Excel or PowerPoint files, you can convert them yourself using Adobe Acrobat or Illustrator or Macromedia FreeHand.

Collect&Send, another new feature, lets you use an online preflight service from within the program and collect fonts for preflighting (something XPress 4 doesn't do). But while some of the preflight alerts are helpful, the service completely missed a screen-angle conflict in a multi-ink color.

These first two features are rather cool, but the Shortcuts component is disappointing. Instead of giving you a way to customize shortcuts, it provides only a shortcut palette. It doesn't even list menu commands that don't have keystroke equivalents, such as Fit Box To Picture. But you can create a set of commonly used shortcuts and keep them in a separate palette.

QX-Tools mainstays include the Styles, FindChange, Scaler, Viewer, and Layers components. The Styles component adds object styles, which make it very easy to perform global changes on items you have assigned the same style to. With the FindChange component, you can search for object attributes such as stroke color or background color and then change all of them at once. The Scaler component gives you more control over scaling objects. The Viewer component offers a preview palette for your document. And the Layers component means that you don't need to upgrade to QuarkXPress 5 to use layers.

Macworld's Buying Advice

In terms of features, QX-Tools Pro is a beneficial product for QuarkXPress 4 users who don't already use QX-Tools 4, and first-time QuarkXPress users starting out with XPress 5 will find that most of the XTensions (aside from Layers) are useful. But the three new components in this collection are not reason enough to upgrade from the previous version, QX-Tools 4.—SANDEE COHEN

RATING: ★★★½

PROS: Useful object-styles XTension; FindChange component makes changing attributes easy; helpful Import utility; layers for XPress 4.

CONS: Few new features for those who have QX-Tools 4; Import doesn't convert files to editable Quark tables.

PRICE: $200; upgrade from QX-Tools 4, $60

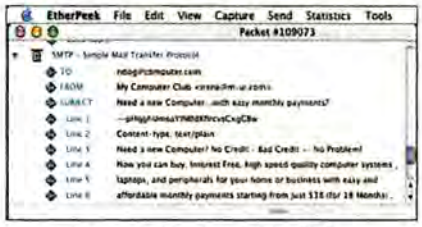
OS COMPATIBILITY: Mac OS 9

COMPANY: Extensis, 800/796-9798, www.extensis.com

ETHERPEEK 4.1

OS X Version of LAN Analyzer Gains Some Features, Loses Others

A LAN analyzer lets network administrators examine traffic at the bit and byte level so they can quickly troubleshoot network ailments. One such product is WildPackets' venerable EtherPeek, which is now available for Macs running OS X. But while EtherPeek 4.1 for Mac OS X sports several new protocol decoders, provides more stability when running alongside other applications, and offers improved performance, it lacks some helpful utilities that were bundled with the previous version of the program (*Reviews*, January 2000).



E-mail Intercept EtherPeek 4.1 for OS X can intercept e-mail packets and assemble them into readable messages—for troubleshooting purposes, of course.

Despite this slight step backward, EtherPeek is still a world-class troubleshooting tool. It captures packets from attached Ethernet or AirPort networks and uses specialized decoders to break those packets down into their component fields. This version adds new decoders for BGP, CHAP, Napster, PPTP, RTSP, SIP, and SNTP to hundreds of existing decoders. Also enhanced is decoding for FTP, HTTP, POP, IMAP, and Telnet. Plug-in analyzers extend the protocol decoders to perform useful chores such as detecting hacker attacks, logging HTTP sessions, and reconstructing e-mail messages. You can also filter packets using multistage AND, OR, and NOT conditional logic.

EtherPeek performs real-time statistical analysis of captured packets by protocol, node, or conversation, and it can export statistics as HTML or XML. EtherPeek can also generate traffic, so it's a useful tool for testing applications and hardware.

In our tests, EtherPeek 4.1 was only slightly faster than EtherPeek 4.0.2 running in OS 9. A WildPackets representative says that the OS X rewrite aimed for compatibility, rather than speed, but that future versions will better exploit OS X performance features.

This version of the program is missing two useful utilities that were bundled with the previous, OS 9 version: EtherHelp and iNetTools. EtherHelp runs on a remote Mac to capture traffic for later analysis in EtherPeek, and iNetTools is a network probe with Ping, Traceroute, and other functions. OS X's built-in Network Utility application provides similar features, and WildPackets plans to include EtherHelp in a future release.

Macworld's Buying Advice

EtherPeek is still head and shoulders above comparable products on other platforms. Although EtherPeek 4.1 for OS X is not a radical improvement on the previous version, it's the first OS X–native commercial network analyzer and therefore the perfect choice for network administrators running OS X.—MEL BECKMAN

RATING: ★★★★

PROS: Extensive protocol-decoding library; conditional filtering mechanism; useful plug-in analyzers.

CONS: Missing some of the previous version's utilities.

PRICE: $1,295; upgrade from version 4.0.2, $400

OS COMPATIBILITY: Mac OS X

COMPANY: WildPackets, 800/466-2447, www.wildpackets.com

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■□□□ **Digital Photo (Print) Division**
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Entry Period

Monday, April 1- Tuesday, September 3, 2002

All entries must be received by 5:00 pm local time on September 3, 2002

For official contest rules, please visit www.canon.com/cdcc/

Judges

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tomato (Creative Unit, UK)
Katsura Moshino (Illustrator/Art Director)
Hiroyuki Nakano (Director)
Scott Ross (CEO, President, and Co-founder of Digital Domain, Inc.)
Joshua Davis (Artist/Technologist)
Special Judge: Ryuichi Sakamoto (Musician)
Contest Supervisor: Hiroshi Kashiwagi (Professor, Musashino Art University)

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REVIEWS

PALM DESKTOP 4.0

OS X–Native Palm Software Arrives with Some Shortcomings

Palm Desktop 4.0, the software that lets you sync your Palm handheld with your Mac running OS X, has finally arrived. But besides the program's synchronizing capabilities and Aqua look-and-feel, there are few improvements to its interface or features, making it a disappointing upgrade.

OS Matters

While it's good that Palm owners no longer need to sync in Classic, a big problem for Palm Desktop users is that the OS 9 and OS X iterations of the program cannot share a data file, so if you install Palm Desktop in your OS 9 and OS X Applications folders and then synchronize under each operating system, your data will end up out of sync. You should also be sure that you want to upgrade to Palm Desktop 4.0 in the first place, as simply running the program's installer removes all previous versions of Palm Desktop from all mounted hard drives.

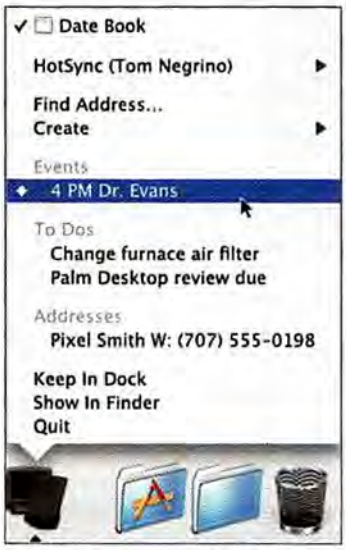
For OS X users, version 4.0 actually takes a small step backward. In version 2.6.3, the Instant Palm Desktop extension generated an icon, in the menu bar, that showed and let you create events, to-do items, and contacts, even if Palm Desktop wasn't open. This version doesn't include a *dockling* (a helper component that stays in OS X's Dock and provides a pop-up menu with information and commands), as Power On Software's Now Up-to-Date and Contact 4.1 and later do. Instead, the Instant Palm Desktop menu appears only when you click and hold on Palm Desktop's Dock icon. Inconveniently, the application must be running for this to work.

Palm Desktop now supports vCard and vCal files, making it easy to share address-book and calendar items, respectively, with other applications (including Microsoft Entourage and the new Contacts feature of Apple's iPod).

Getting in Sync

Synchronizing performance was generally quick, except for the initial sync, which took more than 10 minutes. But our attempts did not always work. On several occasions, the HotSync Manager would work correctly one time and then wouldn't work again until we restarted our Mac.

Synchronizing in OS X works only via USB. If you have an older Palm cradle that uses your Mac's serial port, you'll be able to connect it to your Mac with the help of Keyspan's USB PDA Adapter (other manufacturers' adapters are not supported). At press time, Handspring didn't support Palm Desktop 4.0 for use with any of its products, although there were widespread reports that HotSync worked with Handspring devices.



In the Dock The Instant Palm Desktop menu is under the Dock icon; choosing a menu item opens it for editing.

The release of Palm Desktop 4.0 has also allowed other companies that make OS X applications to update their conduits, which enable synchronizing with the Palm. Rewritten conduits for the OS X versions of Now Up-to-Date and Contact, FileMaker Mobile, Chronos Organizer, and Microsoft Entourage have been released or announced. And if you're waiting on any of these, you should continue to synchronize with your pre–OS X system and wait before upgrading to Palm Desktop 4.0.

Macworld's Buying Advice

Palm Desktop 4.0 is OS X native, but Palm left most of the program's features untouched. If you use either OS 9 or OS X exclusively, then Palm Desktop 4.0 should suit your needs despite its idiosyncrasies, especially if you're looking for a free solution. If you switch between operating systems, you'll have to decide which OS will be the one for your Palm.—TOM NEGRINO

RATING: ♦♦♦
PROS: Provides OS X–native synchronization.
CONS: Can't share data between OS 9 and OS X iterations of Palm Desktop on the same machine; synchronizing sometimes fails to begin.
PRICE: free
OS COMPATIBILITY: Mac OS 9, Mac OS X
COMPANY: Palm, 800/881-7256, www.palm.com

iMAC G4/700

♦♦♦♦; Apple Computer, 800/692-7753, www.apple.com; $1,599

Offering the same groundbreaking industrial design as its 800MHz counterpart (♦♦♦♦½; "The Fast Crowd," May 2002), the midlevel 700MHz edition of the iMac G4 is what you might expect—not as equipped as the more expensive model, but priced lower.

This model differs from the top-of-the-line $1,899 iMac: it has a smaller, 40GB hard drive (as opposed to a 60GB drive in the top model) and a combo optical drive that writes CD-Rs and reads DVDs (instead of the DVD-burning SuperDrive in the high-end model). For many users this is an attractive option, even though the price has been increased by $100 since the iMac G4s were announced.

In Macworld Lab tests, this new iMac, while slower than the 800MHz model, was noticeably faster than the previous generation of iMacs. In our Speedmark tests, which measure overall system performance, the new model scored 132—not as good as the 140 of the 800MHz model, but much better than the 119 of an iMac G3/700. In tests with G4-enabled applications, the iMac G4/700 also shone. In our Adobe Photoshop tests, for example, the iMac G4/700 ran 33 percent faster than the iMac G3/700 but 21 percent slower than the iMac G4/800.—JASON SNELL

LIVESLIDESHOW 2.0

♦♦♦♦; Totally Hip Software, 604/685-6525, www.totallyhip.com; $50

If you're seeking a full-featured slide-show application, you should give Totally Hip Software's LiveSlideShow 2.0 a look. This OS 9– and OS X–compatible program excels in its ability to present digital photos as QuickTime-movie slide shows that incorporate scrolling captions, transition effects, navigation buttons, sound, and themes. You could use an application such as Apple's iPhoto to create slide shows with the click of a button, but LiveSlideShow's iMovie-like interface is nearly as easy to use—you simply drag and drop images onto a timeline and preview your work as you go.

LiveSlideShow also includes welcome audio enhancements. Thanks to the program's built-in audio-recording function, you can add narration to individual slides. New to version 2.0 is the ability to add a background-music track and match the slide show's length to the music's. The program now lets you play slide shows at full-screen size and copy-protect your work. While additional themes are available as free downloads from Totally Hip's Web site, we'd like to see more variety, as well as tools for creating your own themes.—CHRISTOPHER BREEN

SPLAT 1.0

♦♦♦½; Alien Skin Software, 888/921-7546, www.alienskin.com; $99

Alien Skin Software's Splat offers six fun filters for use with Adobe Photoshop 5.0 and later (including Photoshop 7.0 in OS X) and Macromedia Fireworks 3.0 and later. The Fill Stamp filter peppers a selected area with random images of a certain category (mixed nuts, for example), and if you keep the density high, you can partially cover your source photo (of your bridge-playing aunt, for example) with the images you choose. Similarly, the Patchwork filter uses patterns, such as photorealistic stitches, light pegs, or even ASCII text, to render your original image. And the Frame filter surrounds your selection with designs or images of natural media, but unlike most framing tools, it brings in different side and corner images. However, you can't alter the frame's color before applying the filter; some of the other filters have similar restrictions.

Overall, the effects run a bit slower than those supplied by Adobe, and previews take a few seconds to render. But the effects look sharp even at print resolution, and Alien Skin designed the interface thoughtfully: you can enlarge the preview window and undo to your heart's content, and each filter has a number of useful presets.—DAVID WEISS

FIREWIRE DRIVEDOCK

♦♦♦½; WiebeTech, 316/744-8722, www.wiebetech.com; $100; with power supply, $130

WiebeTech's OS X–compatible FireWire DriveDock makes quick work of converting an internal IDE hard drive into a portable FireWire device. Simply connect the DriveDock's little blue block connector and power brick to your old drive, and use a FireWire cable to connect the DriveDock to your computer's FireWire port—the device then mounts on your desktop. (The power supply is not included, but it's available for an additional $30. You'll need to buy one if you plan to use this drive externally.) Performance depends on the drive you use in the FireWire DriveDock but compares favorably to the performance of other external drive kits that use the same highly touted Oxford 911 Bridge.

Unlike most drive kits, the DriveDock does not have an outer case, so it has a bare, industrial look. But it does have a bottom plate with four small rubber feet, which prevent vibration and protect the drive's internal electronics. Although the DriveDock takes up less desktop space than an encased external drive kit, we found that the external power brick was a bit unwieldy when we transported the drive between workstations.—JAMES GALBRAITH

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MYOB FIRSTEDGE

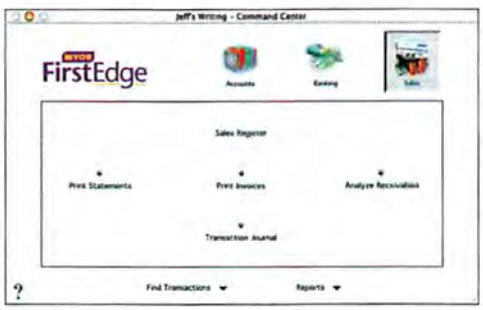
Intuitive Financial-Management Package for Small Businesses

If you're running a small business, chances are you've cobbled together your existing applications into a makeshift system that meets your business's financial needs. You may use Quicken for bookkeeping, Microsoft Word or AppleWorks for invoicing, Microsoft Excel for keeping track of payments and receipts, and yet another program for managing contacts. It can get confusing.

Enter MYOB FirstEdge, which includes the features from MYOB's high-end product, AccountEdge, that are most relevant to small businesses; it's a versatile package that's ideal for companies with one or two employees or for the self-employed. We found that FirstEdge was easy to use, and we were impressed by its excellent reporting functions, ability to work with online banking formats, and painless setup.

Out of the Box and Straight to Work

FirstEdge was designed to meet the needs of businesses with no use for accounting features such as inventory management, time billing, and payroll. What FirstEdge provides are features for handling quotes, invoicing, receivables tracking, banking, and contact management—as well as 60 customizable reports—all wrapped in a user-friendly interface.



Sibling Symmetry As in MYOB's higher-end AccountEdge, you can access all activities from a single entry window.

FirstEdge has an almost effortless setup process. The program's New Company File Assistant walks you through six quick steps and has you up and running in a matter of minutes. First you enter some basic business information—such as your company's name, address, and tax ID number. Then you select your business type. FirstEdge ships with 83 predefined business types that run the gamut from religious organization to entertainment company, and each one includes appropriate income, expense, and asset accounts. Once you've selected your business type, you can easily customize these accounts by adding or deleting items.

If you already have contact, banking, sales, or payment information stored in another program, and as long as you can save that information in a tab- or comma-delimited text file, FirstEdge lets you import it with relative ease.

But we have a couple of caveats. Although importing banking and contact information is a snap, importing sales data is a bit irksome. FirstEdge is picky about how sales text files are formatted, and importing them can require some experimenting and tweaking.

Getting to the Bottom Line

To make entering billing, quote, invoice, and banking information easy, FirstEdge embraces the register interface familiar to users of Quicken or the defunct QuickBooks. From

DiskWarrior® has
than

1999 Macworld Editors' Choice Awards
Winner, Utility Software. "DiskWarrior is an excellent ax to add to your disk-repair and -maintenance arsenal. DiskWarrior's ease of use, speed, and new method of fixing disk problems make it a powerful disk-maintenance product."

1999 MacUser Awards
Best Utility/Enabling Software. "For providing a new, easier to use, safer, and often more successful alternative to more bloated recovery applications, the judges felt DiskWarrior deserved top billing..."

1999 Apple Design Awards
Most Innovative Product, Runner-up Best New Product

5 Out Of 5 Stars
"Every Mac on the planet can benefit from DiskWarrior!"

Repairs disk problems such as disks that won't mount, files you
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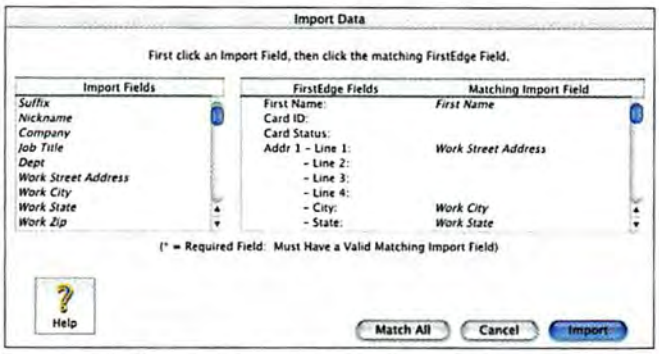

Import-ant Options FirstEdge makes it easy to import data from most of your legacy accounting applications.

a single window, you can create quotes for new business, enter sales, view open invoices, show closed sales, and issue credits. You can also view the details of any register item. Adding line items to existing quotes is intuitive, and you can convert any quote into a sale with the click of a button.

When you need to send a quote or invoice to a client, the program can turn it into a PDF file and then attach it to an e-mail, save it, or fax it. (Faxing is not currently available in OS X.)

Banking in FirstEdge works just the way you'd expect it to. You enter all your transactions in a single window. A drop-down menu lets you select whether you're going to spend money, receive money, create a new sale, or receive a payment from a customer. When it's time to reconcile your accounts, the Get Statement command lets you import any type of statement you can download from your bank, from text files to Microsoft Money and QIF files. If you're accustomed to the account-reconciliation ease of programs such as Quicken, you won't be disappointed with FirstEdge. Reconciling imported statements is just as easy as it is in that program.

FirstEdge ships with a collection of 60 reports—from balance sheets to aging lists (which show you the customers who have overdue invoices and how late they are)—that you can customize for your business. Each report can be viewed within FirstEdge or saved to a variety of formats, from PDF and HTML files (which you can then send via e-mail to your accountant) to tab- and comma-delimited text, which you can easily import into a spreadsheet program.

Macworld's Buying Advice

MYOB FirstEdge is exactly what kitchen-table businesses have been waiting for: one program that does it all. FirstEdge is amazingly mature for a program in its first release, and we chalk this up to its roots in a more full-featured accounting program. FirstEdge's easy quotes and invoicing, along with its excellent banking and reporting tools, will delight small-business owners who want to make their financial matters as hassle-free and integrated as possible.—JEFFERY BATTERSBY

RATING: ★★★★½

PROS: Excellent reports; easy quoting and invoicing; intuitive for users who are unfamiliar with accounting; banking module well integrated with a variety of online-banking file formats; quick setup.

CONS: Importing sales data is clumsy and requires special formatting.

PRICE: $99

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: MYOB, 800/322-6962, www.myob.com

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PEAK 3

Audio Editor Packs Powerhouse Features, but Its Interface and Performance Fall Short

BY JIM HEID

Here's the good news: Digital audio on Mac OS X is reaching new heights, thanks to powerful two-track audio editors such as Peak 3, from Berkeley Integrated Audio Software (BIAS). (It runs in OS 8.6 and later, too.) Suited to musicians and video and audio professionals, Peak 3 takes advantage of OS X's new audio architecture and includes several user-interface enhancements and some new audio-processing plug-ins. But there's bad news: The program continues to suffer from user-interface flaws, which can make it frustrating to use.

Audio Tool Kit

Peak's tools are generally intuitive, and the dialog boxes for Peak's more advanced audio-processing functions include helpful descriptions. Peak continues to offer powerful batch-processing capabilities that let you easily apply its audio-tweaking talents to a hard drive full of files. These batch features come in handy—for example, when you want to normalize the audio in a set of files before editing them. And the program still has many components aimed at musicians who edit audio files before transferring them to sample-playback instruments.

Peak 3 comes with 25 plug-ins, a few of which are OS X native. The plug-ins range from one that de-emphasizes sibilance to one that simulates Leslie rotating-horn speakers. But the most notable are the new VBox SE, a slick plug-in that lets you combine VST plug-ins and route audio signals between them, and BIAS Freq, a four-band parametric equalizer for boosting or attenuating certain frequency ranges.

The program also sports improved features for converting between sample rates, some redesigned tool palettes for its editing and scrolling tools, and an improved audio-level meter, which displays audio levels as a clip plays.

Most of the enhancements in Peak 3 center around OS X. Peak now employs OS X's user-interface elements, although the program's toolbar has a crude, black-and-white design that looks out of place in the colorful world of Aqua.

Auditioning Peak Like all audio editors, Peak displays an audio file as a waveform. Stereo tracks appear stacked atop each other, while the overview display near the top of the window lets you quickly jump to a specific area. BIAS Freq, an OS X–native VST plug-in, provides four-band equalization.

Peak 3 also supports OS X's Core Audio technology, which is more reliable than the Sound Manager in previous Mac OS versions—at least in theory. At press time, the driver software for most professional audio hardware had not yet been updated to work with OS X, so OS X users will have to use their Mac's built-in audio circuitry until an update is released.

Not-So-Peak Performance

Running Peak almost exclusively in OS X, we used the program to edit several voice-overs. Peak was always fast and responsive, even when working with audio clips that were 30 minutes long.

But throughout the process, the program crashed randomly, often becoming unstable as an editing session wore on. (BIAS confirmed that version 3.0 had numerous bugs, and it released version 3.0.1 at press time. We've spot-checked this update, and it appears to address the instability issue).

However, Peak's user interface, historically rough around the edges, still needs a makeover. For example, Peak doesn't have a Preferences command that leads to a dialog box. Instead, it offers a Preference menu containing a whopping 28 commands. Peak also doesn't have contextual shortcut menus, which would help users execute common tasks more quickly.

What's more, Peak lacks a printed manual. The documentation, a 198-page PDF file, contains ample information, but such a complex program (especially one that ships in a box that's about 3 inches thick) should include a printed manual.

Peeking at the Family Tree

Peak is also available in two low-end, OS X–native editions—the $99 Peak LE and the $199 Peak DV. With the LE and DV editions, you don't get Peak 3's batch-processing feature, some of its audio-processing capabilities, or support for the same number of high-end audio formats and sampling rates that professional audio hardware can use.

Peak LE is suited to basic audio work, such as editing recordings before preparing them for Web delivery; Peak DV, which is bundled with Apple's Final Cut Pro and DVD Studio Pro 1.5, is geared toward video editors. Peak DV has more audio-processing features than Peak LE—features for converting between mono and stereo formats and repairing audio clicks, for example. Peak DV can also open QuickTime movies and play them as you manipulate their audio tracks.

Despite having fewer features, these versions are similar to the top-of-the-line Peak 3: they offer unlimited undos and operate nondestructively, and your edits and modifications to the original audio file take effect only when you apply the Save command. (A fourth version of Peak, the $699 Peak TDM, works with Digidesign Pro Tools audio hardware, but it has not yet been updated for OS X.)

Macworld's Buying Advice

Peak 3 is a fast and powerful program, but it's hampered by a cumbersome interface. Peak remains an excellent tool for musicians and audio and video professionals. And now that BIAS has made Peak OS X native, the company should start sweating the details so it can deliver another update that addresses this version's interface flaws. □

RATING: ♦♦♦½

PROS: Powerful and versatile; fast performance.

CONS: Interface needs improvement; no printed manual.

PRICE: $499

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Berkeley Integrated Audio Software, 800/775-2427, www.bias-inc.com

4D WEBSTAR V 5.1

Revamped for Mac OS X, Easy-to-Configure Web Server Software Yields Excellent Results

BY STEPHAN SOMOGYI

With the advent of OS X, Mac users have access to a wealth of server software that has already proved its mettle in the Unix world. For example, Apache, which is included with OS X, is the world's most widely used Web server. It offers seemingly unlimited features, excellent performance, and reliability; however, its text-based configuration and maintenance are byzantine by Mac standards.

But Mac users don't have to settle. 4D has completely rewritten its WebStar Web server and delivered WebStar V 5.1.1, which makes OS X Web-server configuration much more palatable—for experienced administrators and novices alike. This full-featured package provides an easy-to-use interface without sacrificing server performance; it's also a viable alternative—along with Tenon's $299 iTools 6.5 (which claims to let you configure Apache through a Web-based interface)—to configuring Apache the old-fashioned way. The only downside to the package's rewrite for OS X is that existing WebStar plug-ins, such as FireSite and NetCloak, must be rewritten to work with WebStar V; these plug-ins simply won't work with the OS X–only WebStar V.

Despite its easy configuration, the WebStar V package isn't short on substance; it includes Web and FTP servers, myriad plug-ins that extend the core Web server's capabilities, and Java-based administration software for OS X and Windows—but not OS 9.

Setup and Configuration

Installing WebStar V is straightforward: for security reasons, create a new user named "webstar" on your OS X system and then run the installer. Launching the server for the first time also launches WebStar Admin Client, which allows remote and local maintenance and configuration of a WebStar V server via an interface that, while slightly awkward due to its Java roots, will be familiar to WebStar 4 users.

Above and beyond setting up server-wide preferences, WebStar V allows the server administrator to delegate virtual host-specific configuration settings. For example, if you have a building-wide Web server, the administrator can allow each department to have control over only those settings that are specific to its site, without relinquishing control of the entire server configuration. This feature can considerably lighten a server administrator's workload and make control of sites easier for each department.

Options and More Options

Although WebStar V doesn't support the many available Apache modules, 4D's out-of-the-box additions to the program's core feature set will handily address the needs of most users. In addition to WebStar V–specific plug-ins, version 5.1.1 supports standard CGI applications, including those written in AppleScript, Perl, or any other CGI-compatible scripting language. This version also includes FastCGI support, which can noticeably improve performance for CGI-type applications. (For example, WebStar V ships with a FastCGI rendition of the PHP dynamic-content generation system.)

Other built-in WebStar V options include a content-indexing and search engine, WebDAV support, Java servlet support via the Apache project's Tomcat technology, and connectivity with 4D's flagship database. Secure Sockets Layer (SSL) support is also integrated, for those who want to encrypt Web traffic to and from their servers. And easy-to-use tools are provided for getting your server's certificate.

The Keys to Their Own Kingdom WebStar V's administrative delegation capabilities allow clear separation of serverwide and site-specific configuration options.

WebStar V makes enabling features such as SSL and FastCGI support easy, whereas giving Apache's stock configuration the same capabilities would require compiling and installing Apache modules—a nonintuitive task for many administrators.

It Just Works

Apache is well known for its excellent performance, so our main goal was to find out, in a simple test, whether WebStar could match it. So Macworld Lab pitted WebStar V 5.1.1 against Apache 1.3.23, using a set of tests based on the ApacheBench testing tool and a mix of file types and sizes that closely represent the types of pages both products would serve. The only configuration change we made to Apple's stock Apache installation was enabling server-side includes to generate relatively simple dynamic Web pages.

We set up three test clients, each configured to generate eight connections, and had them request the files from a single Web server (a dual-1GHz Power Mac G4 with 512MB RAM) over a 100BaseT Ethernet network. Our test results showed that WebStar V's performance was almost indistinguishable from Apache's overall. In the two instances where one clearly outperformed the other, WebStar V was the winner.

Documentation

WebStar V may be easy to configure and maintain, but its documentation leaves much to be desired. The installation guide provides a good walk-through of the steps required, but if you encounter a problem, you won't find troubleshooting information there. Instead, you'll either have to use up one of the 12 tech-support incidents that you're afforded in the first year or ask for help on the WebStar-talk e-mail list.

It was also disappointing that the technical reference explained the server's configuration options but failed to mention the server-side include directives that WebStar V supports. The manual also doesn't mention PHP, which WebStar supports; its installation is described in a file buried deep in the server's folder hierarchy.

Macworld's Buying Advice

WebStar V offers easy-to-use graphical server management from Mac OS X and Java-enabled Windows clients, and it's ideal for both seasoned administrators and Web-serving novices. Because WebStar V 5.1.1's performance is equivalent to Apache's (and in some instances, better), the choice between the two depends on whether you want to pay for ease of use or spend some time configuring a free product. □

RATING: ♦♦♦♦

PROS: Includes graphical admin application that allows delegation; straightforward setup and maintenance; performance comparable to the well-regarded Apache Web server's.

CONS: Documentation has notable gaps; no Mac OS 9–based admin.

PRICE: $399; educational institutions, $299; upgrades from WebStar 4.X, $199

OS COMPATIBILITY: Mac OS X

COMPANY: 4D, 800/785-3303, www.webstar.com

REVISION 1.1

Development Tool Offers Easy Way to Create Cross-Platform Apps

After its introduction in the late 1980s, Apple's HyperCard made programmers out of many who would never have considered developing software. Runtime Revolution's integrated development environment, Revolution 1.1.1, is a reincarnation of HyperCard technology. Although the program is geared toward professional developers, it's not too complex for beginners.

Revolution builds on HyperCard's core concepts: stacks and cards. It lets you generate new cross-platform applications and helps you renovate your old HyperCard stacks for Mac OS X, the classic Mac OS, Windows, and Unix. And it expands the HyperTalk language with its own superset, called Transcript, which eliminates the need for many Mac-only XCMD and XFCN HyperCard extensions.

Revolution offers ample online documentation, including tutorials for programmers of all levels. Creating a new stack, adding cards and buttons, and attaching scripts are simple operations. Revolution has other helpful enhancements, such as a floating Object Inspector window that provides details on the form and function of a selected object.

But Revolution's multiplatform support has an Achilles' heel: the program's interface doesn't quite adhere to OS X's conventions. Revolution's Quit and Preferences options, for example, aren't under its application menu; they're under the File menu, as in the classic Mac OS. This kind of issue is typical of development tools that offer "write once, run anywhere" capabilities, as Revolution does.

Macworld's Buying Advice

Revolution 1.1.1 provides a cross-platform way to to build a GUI-based application. Longtime software developers can take immediate advantage of Revolution's familiar programming environment, and newcomers will be able to get up-to-speed quickly.—STEPHAN SOMOGYI

RATING: ♦♦♦½

PROS: Helpful online documentation; run-times for multiple platforms; full-featured development environment.

CONS: Imperfect user interface.

PRICE: Student-Teacher Edition, $99; Small Business Edition, $299; Professional Edition, $995

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Runtime Revolution, www.runrev.com

PAGESPINNER 4.0

♦♦♦; Optima System, www.optima-system.com; $30

With Macromedia Dreamweaver and Adobe GoLive building on their WYSIWYG Web-design foundations to include more features (at higher prices), Optima System's PageSpinner 4.0 provides a lower-cost alternative, without the bells and whistles, for those who simply want to create Web pages. This version is OS X compatible, and it continues to support XHTML and let you employ Cascading Style Sheets (CSS) and JavaScript, even if you don't know HTML.

But not much else has changed in PageSpinner since version 3.1, apart from its move to OS X. Its assistants don't allow you to change existing tags—if you make a mistake or change your mind, you have to retype each one; and the built-in HTML checker still doesn't check CSS for coding errors. PageSpinner is also starting to show its age; for example, the Internet Tools palette includes an option for Claris Emailer but not for Microsoft Entourage. And unfortunately, the included StyleSpinner application (for writing CSS) is not yet OS X native. But despite its shortcomings, PageSpinner 4.0 will fit the bill if you're looking for a functional and affordable OS X application for building Web pages.—DORI SMITH

> 800MHZ Titanium PowerBook G4

continued from page 26

two fans rarely came on, and when they did, their pitches were much lower than the 500MHz PowerBook G4's. The Combo drive was also quiet, aside from a startling click when you insert a disc.

Overall, the 800MHz PowerBook ran much cooler than any Titanium PowerBook we've tested so far. We ran the PowerBook as a desktop system for days, with its lid closed and connected to an Apple Cinema HD Display and a mouse and keyboard, and the PowerBook was rarely too hot to handle—a malady all too common with previous models.

Macworld's Buying Advice

Make no mistake—despite its physical similarities to previous PowerBooks, the PowerBook G4/800 is no mere evolution of the PowerBook line. Apple has done much more than bump up speed and add some minor features. The $3,199 price is higher than we would like, but the extras—the high-speed processor, cache and video subsystems, increased screen resolution, new video options, higher RAM complement, and built-in AirPort—alleviate some of the sticker shock. This really is the closest Apple has come to providing desktop power in a PowerBook. □

> Combustion 2

continued from page 27

ideal when you need to match colors between layers.

Two major additions to version 2 are new text features, which make Combustion just about the best character-generating app available for the Mac, and an amazing particle-generation system that allows for quick and easy rendering of everything from fire and smoke to explosions and pixie dust.

Finally, Combustion renders at very high speeds (though your performance will depend on your RAM capacity and OpenGL card), and Discreet generously includes network-rendering software with the package.

Macworld's Buying Advice

If you create composites or perform rotoscoping for a living, Combustion is well worth the investment. Although other, lower-priced programs provide some of Combustion's functionality, its excellent interface and professional-caliber features make it a pleasure to use. You'll have to rethink some of your work habits, but you'll be glad you did. □

> LiveMotion 2.0

continued from page 32

To speed up repetitive tasks, such as batch processing and drawing repeating shapes, LiveMotion 2.0 introduces automation scripts and LiveTabs. JavaScript-savvy users can create and share automation scripts that control any part of the authoring environment. LiveTabs add an interface to automation scripts, making them accessible to nonprogrammers.

Macworld's Buying Advice

LiveMotion 2.0 is a strong product that at last provides a viable alternative to Flash as an authoring tool. With a vastly improved feature set, this version will appeal to many users who approach building interactive Web content with trepidation.

Ultimately, your decision about which Web-animation tool to choose may hinge on the other products you use. While Flash has great integration with other Macromedia products and remains a step ahead in programming capabilities, LiveMotion's killer integration with other Adobe tools and its lower price may lure Photoshop and Illustrator users into the world of Web animation and interaction.—MARTIN GITTINS

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Escape Velocity: Nova, Wipeout 2097, the Adaptoid, Coldstone

Lost in Space

WHETHER YOU'RE BEING SHOT AT WITH AN ANGRY SPACE pirate's photon torpedoes or sliding your futuristic speed racer into a wall at 300 miles an hour, playing games can put you in situations you'd never dreamed you'd be in. But have you ever dreamed you'd make your own game or recycle old gaming controllers for use on your Mac? All things are possible in this month's edition of *The Game Room*.

Wild Ride Escape Velocity: Nova lets you travel the galaxy in search of adventure and riches.

Far Out

What a time for a firefight. Even though the carbon fiber I had just added gave my Valkyrie some extra protection, I really didn't need to get into a scrap with these deep-space marauders.

The cargo hold of my ship, the *Thuferin Thucotash*, was filled with passengers bound for Tau Ceti and a load of emergency medical supplies headed to Dunroamin that absolutely, positively had to get there fast—and I needed the money both these missions would net. But these brigands weren't giving up, so I trained my weapons on the enemy ships and let them have it. My shields took a beating, but I took care of business—at least I thought I did, until that most dreaded of all pirate vessels, the Manticore, vectored in and blew me to smithereens.

Is this the plot of the latest summer sci-fi blockbuster? No, it's what happens when you become engrossed in Ambrosia Software's Escape Velocity: Nova—namely, you begin to talk with your friends as though what's happening in the game is actually happening to you.

Escape Velocity: Nova is the third game in the Escape Velocity series. A peculiar mix of action and role playing, Escape Velocity has been a legend with Mac gamers since its debut several years ago. This new version improves graphics, adds tons of new story elements, and runs natively in Mac OS X.

Set far in the future, Escape Velocity: Nova puts you in the role of an independent captain of a modest shuttlecraft in outer space. You're tasked with ferrying passengers and cargo from one star system to another to earn your living. In some locations, you can find outfitters who will—for a price, of course—outfit your vessel with weapons and equipment that will help you go faster, carry more, protect yourself better, and make sure you stay around to keep earning money. Most planets and space stations are also equipped with a Mission BBS system that helps you find work. Local bars serve as areas for other meetings that can net lucrative jobs, even if the wages you earn are sometimes paid under the table.

Depending on the missions you choose and the manner in which you conduct yourself, you'll activate specific story options in Escape Velocity: Nova that will then determine the outcome of the game you play. There are about half a dozen specific story arcs embedded in Escape Velocity: Nova, each with its own risks and rewards. Additionally, you can just ferry passengers and cargo, become a rebel or a pirate, or simply wander around the stars.

> Ambrosia has wisely left alone what ain't broken.

However, once you accept a certain series of missions, you're stuck completing the story or dying in the process. If you manage to finish it, you'll have to start over from scratch with a new character before you can do anything else. Even a shuttlecraft pilot deserves a chance at a midlife career change.

The Bottom Line Mixing 2-D action in the form of spaceship battles with adventure gaming is a really appealing combination that's already proven itself in >>

ESCAPE VELOCITY: NOVA

RATING: ♦♦♦♦

PROS: Expansive story line; nice mix of combat and adventure.

CONS: Some story lines are dead ends that make you start over.

PRICE: $30

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Ambrosia Software, 716/325-1910, www.ambrosiasw.com

Choose 91 at www.macworld.com/getinfo

Rocket Sled Race futuristic tracks in the classic PlayStation game Wipeout XL, now on the Mac as Wipeout 2097.

<< two previous incarnations of the Escape Velocity series, and it works again here. The new game benefits from an overhauled engine with improved graphics and an all-new series of story lines, but Ambrosia has wisely left alone what ain't broken.

Fast and Furious

Since the Mac is a niche gaming market, we Mac users depend mostly on games that debut on Windows PCs, dedicated video-game consoles, or both. To some Mac gamers, the speed of a game's progress to the Mac platform is everything. But that's silly—just because a game is old doesn't mean it's bad. Take Freeverse Software's Mac conversion of Wipeout 2097, a game that first appeared on Sony's PlayStation console back in 1996. By any era's standard, it's a stellar 3-D racing game that has held up very well over the years.

Wipeout 2097 is the late 21st century's answer to Formula One racing. You're a pro racer, and you must grab medals in a series of races on different courses around the world. Instead of cars, you're piloting antigravity vehicles. To win, you have to keep your line straight, your corners tight, and your finger on the accelerator. >>

New Life for Old Games: Moving to Mac OS X

You made the move to Mac OS X, and along the way you discovered that some of the games you like to play aren't available for this operating system. Some of them may run adequately in Classic, but hey—it's been more than a year since Apple released OS X. So what's holding up the show?

The answer depends on whom you talk to. Some game companies face the daunting challenge of having to rework their game engines completely for OS X. Others have all their engineering resources wrapped up in new game development. It may not make sense for some of these companies to spend money on games that are unlikely to generate much more revenue. Others, however, see OS X as an opportunity to garner additional income or support their loyal users.

Blizzard Entertainment has revisited its game collection to make it work in OS X, with excellent results. Blizzard initially released OS X–native versions of Starcraft and its companion add-on set, Starcraft: Brood War, and followed that a few months ago with OS X updates of Diablo II and its Lord of Destruction add-on.

Mac game-conversion studio Westlake Interactive has added OS X support for The Sims, Star Trek Voyager: Elite Force, and more. And Westlake's work on new OS X–compatible games built using the Unreal engine has resulted in the release of several preview versions of Unreal Tournament for Mac OS X.

OS X is very much a work in progress as well. Last year's 10.1 release was a sign to many Mac game developers that it was time to begin supporting OS X, since that revision implemented some important underlying changes to make games run reliably and smoothly on a wider range of Macs. Since then, game developers who support OS X have made updates to their software to improve performance. Freeverse Software, for example, released a patch to its popular arcade shooter, Wingnuts, that made it possible for many gamers to use their game controllers again for the first time since upgrading to OS X.

When it comes to OS X support and games, one company stands apart from the rest—MacPlay. The company garnered publicity at Macworld Expo San Francisco (2002) when it boldly proclaimed plans to support OS X exclusively with its future releases. By then, MacPlay had released one OS X exclusive—the offbeat strategy game, Giants: Citizen Kabuto. Other game publishers plan to stick with OS 9 and OS X support for as long as it makes sense.

While you may find that some games have reached the end of the road with OS X, many others have been updated to support the operating system, and more are on the way. The new OS is also driving interest and enthusiasm from new Mac game developers. OS X has definitely got game.

"By far the coolest drives on the planet."

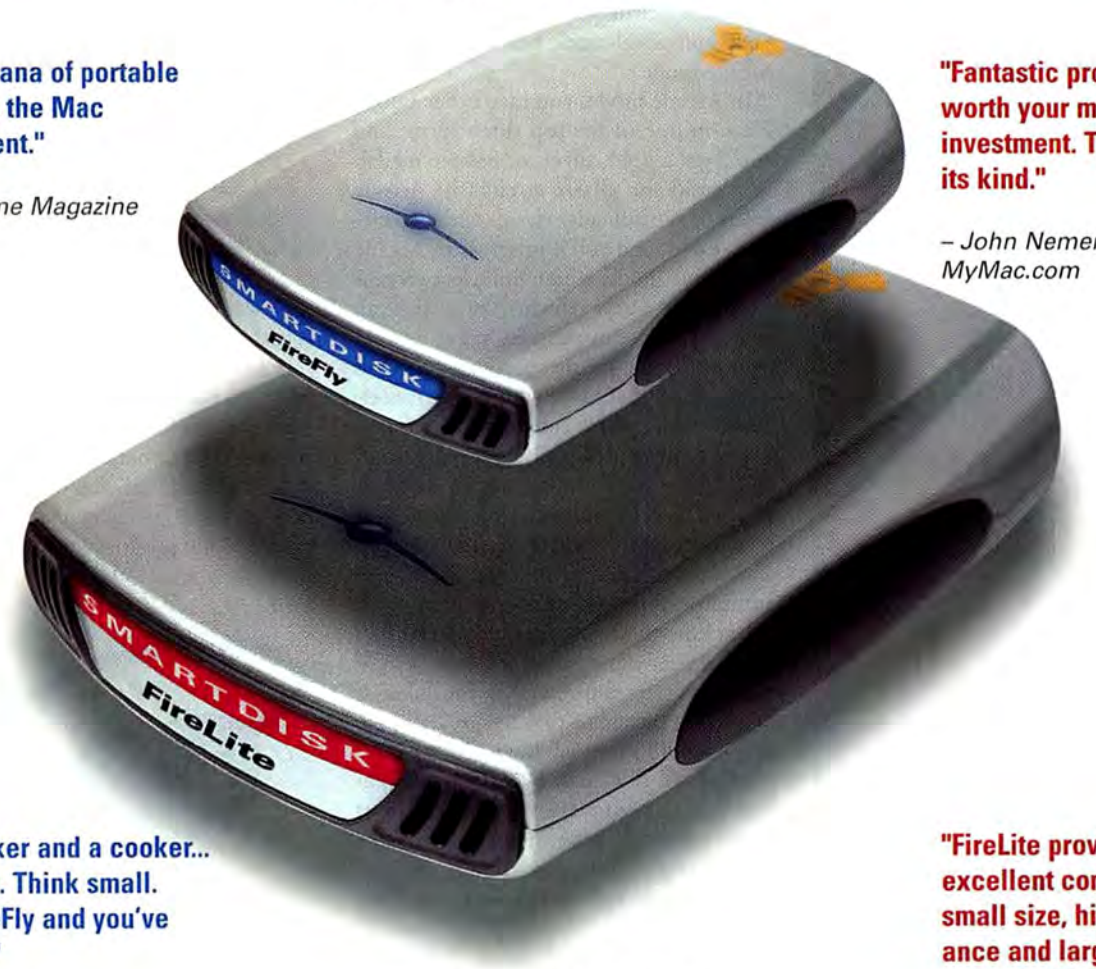
– John Manzione, MacNet2.com

"...the nirvana of portable storage in the Mac environment."

– Mac Home Magazine

"Fantastic product! Well worth your money and investment. The best of its kind."

– John Nemerovski, MyMac.com



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– Dingbatmag.com

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– Steve Becker, MacEase.com

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<< Wipeout offers two different play modes: Time Trial and Arcade. In Time Trial, you race against yourself and the clock, learning the twists and turns of each individual track before you get to Arcade mode.

In Arcade mode, you race other pilots. Place in one of the top three spots, and you'll get a gold, silver, or bronze medal. Win gold for all six circuits in Arcade mode (three difficulty classes with two circuits each), and you'll progress to Arcade Challenge mode, which unlocks two new circuits and a new vehicle to race. You can save and restore in-progress games as well.

Each circuit sports speedups—patches on the track that cause your craft to accelerate. Hitting these consistently and staying away from walls will shave seconds off your lap times. Weapon grids on the track provide various enhancements, such as terrain-hugging rockets, guided missiles, and electro-bolts; or power-ups, such as autopilot, turbo boost, E-paks that boost shield energy, and more. If your craft gets banged up from weapon impacts or wall collisions, you can recharge your shields by driving through a pit-stop area, though doing so will slow you down.

Wipeout 2097 has TCP/IP or AppleTalk-based multiplayer gaming. Alas, it doesn't provide plug-in support for the GameRanger online service, and you need a low-latency Internet connection for a successful match.

The Bottom Line Wipeout 2097 is a nonviolent racing game that's a blast to play. However, it's fairly short, offering only eight race courses. The good news: although the program was originally released for Mac OS 9, an OS X–native update has been released.

WIPEOUT 2097
RATING: ★★★★
PROS: Fast and frantic arcade-style fun.
CONS: Only eight levels; no GameRanger support; requires low-latency network connections.
PRICE: $30
OS COMPATIBILITY: Mac OS 9, Mac OS X
COMPANY: Freeverse Software, 212/929-3549, www.freeverse.com

Dust Off Your N64 Controller

Apple's support of the Human Interface Device (HID) standard for USB devices has been a boon for Mac gamers, because it gives them access to an abundance of game controllers on the market. Thanks to Apple's HID support, joysticks and game pads that don't explicitly support the Mac work like a charm on the Mac platform.

If those cool Mac-compatible controllers aren't enough for you, Wish Technologies has used HID to build the $30 Adaptoid, a bridge between USB and the Nintendo 64. Plug an N64 game controller into the Adaptoid, and presto—your Mac treats the controller like any other HID device.

The Adaptoid has a design of pleasing simplicity. This dongle adds about a foot to the end of your N64 controller cable. One end has a plug for the cable, and the other end is a USB connector that plugs into your Mac.

Although the Adaptoid comes with a floppy disk containing Windows software, no Mac software is necessary. InputSprocket (in Mac OS 9) and HID Manager (in Mac OS X) take care of all that for you. If your games support Apple's game-controller technology, or if you add a third-party application such as USB Overdrive (www.usboverdrive.com), you should be able to get the Adaptoid to work.

One shortcoming of the Adaptoid is that it doesn't provide a way to activate the optional N64 Rumble Pak, which makes the controller shake with force-feedback reactions. That's something the PC drivers do, thanks to Microsoft's Windows-only DirectX technology.

If you're an OS 9 user seeking an adapter for other console controllers, consider >>

Joyous for JoyPort

Speaking of USB game-controller adapters, many veteran gamers are familiar with Kernel Production's excellent JoyPort USB, a multitap adapter that supports various game controllers from different makers, including Nintendo. For just $10 more than the Adaptoid's price, you get the ability to use Sega Genesis, PC game port, Sony PlayStation, and Nintendo 64 controllers on your Mac.

The Joyport is a great alternative for users who don't have near-term plans to upgrade to Mac OS X, since it uses driver-specific code that doesn't yet work with OS X.

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ADAPTOID
RATING: ♦♦♦½
PROS: Plug-and-play compatibility with OS 9 and OS X; brings sturdy and comfortable N64 controller to the Mac.
CONS: Not as well equipped as it would be on a Windows PC; no Rumble Pak support.
PRICE: $30
OS COMPATIBILITY: Mac OS 9, Mac OS X
COMPANY: Wish Technologies, www.wishtech.com

<< Kernel Productions' JoyPort USB (see "Joyous for JoyPort").

The Bottom Line The N64 game controller is terrifically comfortable and sturdy enough to handle almost unimaginable abuse—and that's more than I can say for a lot of the USB controllers I've used. In my book, that makes the Adaptoid a great idea that's worth every penny of its $30 price tag.

Make It Yourself

One shortcoming of Macintosh gaming is that there aren't nearly enough ready-made tools for creating your own games, especially compared with the abundance offered to our Windows-using colleagues.

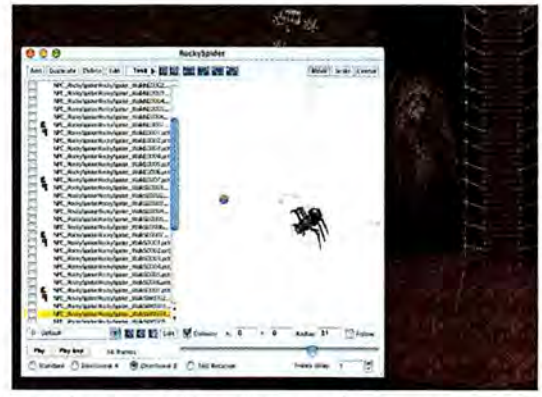
Coldstone Game Engine, a Beenox Studios creation that Ambrosia Software has published, aims to change all that. Coldstone lets you create your own tile-based adventure games, not unlike the old-school offerings from companies like Spiderweb Software or Fantasoft. Depending on your artistic and storytelling skills, you can craft an epic dragon-slaying adventure or make an outer-space game of fantastic proportions.

You're not going to produce the next Diablo II with Coldstone, but if you've ever hankered to create a sword-and-sorcery epic of your own, Coldstone will get you most of the way there. Beenox used the engine to craft Pillars of Garendall, a role-playing adventure game also published by Ambrosia.

Ambrosia and Beenox have made it pretty easy to get started with Coldstone. The software includes everything you need to make your own stand-alone adventure game, complete with plug-ins or add-ons that can enhance the experience further down the road. A 31-page PDF file and a tutorial folder provide all the required instructions and elements.

Coldstone offers just about all the tools you'll need to create your epic. The design tools will help you craft maps, script stories, add dialog from nonplayer characters, supply treasure and weapons, populate the world with countless monsters, and add all the other aspects you'd expect of an adventure game. If you don't want to use one of the supplied map and art sets, you can make your own, which opens up almost unlimited possibilities for how your adventure game will look.

I say *almost* because there's one thing Beenox and Ambrosia can't give you, and that's the talent to tell a story and make a game worth playing. The tools give you the raw power, but you need to provide the creativity. Obviously, it helps to be a real fan of the adventure-game genre and to start with a good idea.

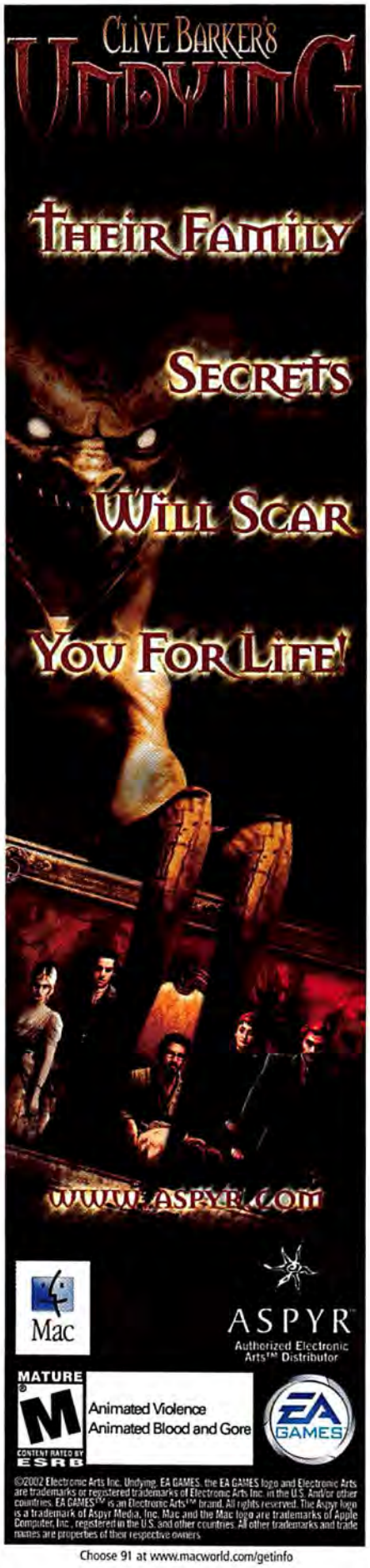


DIY Adventure Coldstone lets you craft your very own adventure game without having to learn how to program.

If you plan to release your Coldstone-built game as shareware or freeware, it'll cost you nothing more than the modest registration fee for the Coldstone engine itself. If you plan to release a commercial product, Ambrosia has flat-fee and royalty-based arrangements, depending on what you can afford. □

COLDSTONE GAME ENGINE
RATING: ♦♦♦½
PROS: Make your own adventure game without learning how to program from scratch.
CONS: Difficult learning curve; you're on your own when it comes to storytelling talent.
PRICE: $49
OS COMPATIBILITY: Mac OS 9, Mac OS X
COMPANY: Ambrosia Software, 716/325-1910, www.ambrosiasw.com

MacCentral.com Senior Editor PETER COHEN admits that his Nintendo 64 has been gathering dust since he picked up a GameCube.



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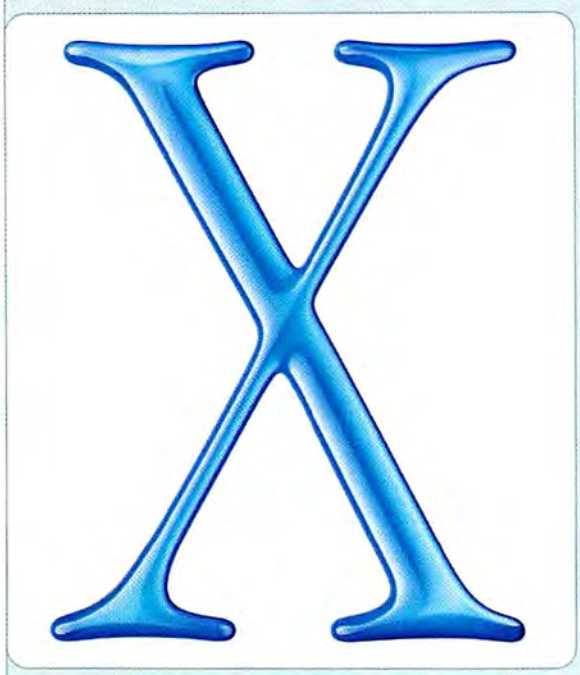
FOCUS ON DIGITAL VIDEO

IT'S A BRAND-NEW SCENE FOR DIGITAL VIDEO EDITORS. And Macs can be found at the center of the action. With the latest releases from Apple, Avid, and others, as well as the powerful capabilities of Mac OS X, digital-video pros have a heap of Mac-friendly tools at their disposal. In this special supplement, *Macworld* looks at a host of new hardware and software offerings aimed at bringing your work from the drawing board to the screen.

OS X GOES HOLLYWOOD *p.52*
AVID XPRESS DV *p. 53*
APPLE'S CINEMA TOOLS *p. 53*
HIGH-END VIDEO CARDS *p. 57*
SOFTWARE AND HARDWARE RELEASES *p. 57*
THE APPLE CINEMA HD DISPLAY *p.57*

THE NEW OS COULD BECOME THE PLATFORM OF CHOICE FOR VIDEO PROS

OS X Goes Hollywood



Even before rolling out Mac OS X, Apple spent considerable time and energy trumpeting the benefits of its new operating system. And while concepts like multithreading, protected memory, and Unix underpinnings sound promising to most Mac users, explaining the real-world benefit of those features can be difficult—unless you happen to work with digital video.

To video professionals—the folks who make a living capturing uncompressed-video streams, editing and enhancing broadcast-quality programs, and encoding and creating high-quality DVDs—OS X's feature list is more than just an assembly of marketing buzzwords. They believe that the new OS is an important addition that makes it easier for them to do their daily tasks on a Mac.

Why are video professionals embracing OS X? Let us count the reasons.

What Lies Beneath

High-end digital video involves huge amounts of data that need to be captured, edited, and rendered. The classic Mac OS wasn't really up to the task.

"For years Apple was getting by with a very innovative and consumer-friendly OS, but one clearly lacking industrial-strength features such as preemptive multitasking and protected memory," says Boris Yamnitsky, president of 3-D compositing software maker Boris FX. "The Unix kernel in OS X has the potential to boost the overall system performance and stability."

As a result, Yamnitsky says, future versions of Boris Red and Boris Graffiti will be "easier to develop, will perform better, and will be more robust." Since video-effects applications tend to be complex and computation-bound, all those improvements will be especially welcome, he adds.

A Beautiful Mind

The multithreading capabilities of OS X have proven to be especially attractive to video pros. Multithreading allows much more to occur in the background, making expensive workstations more cost-efficient.

"Normally under OS 9, the Mac user was locked out when capturing uncompressed video under QuickTime. Now you can read e-mail and surf the Web at the same time," says Grant Petty, CEO of Blackmagic Design. "Batch capture is really boring and time-consuming, so it's really nice to be able to still use the computer."

Petty's company teamed up with AJA Video Systems to create the Kona series of standard definition and high definition video-capture cards, for which Blackmagic Design wrote only OS X driver software.

But the benefits of multithreading appear in more areas than just capturing. "In this line of work, you do lots of rendering, which, if you'll excuse the pun, renders you immobile," says Michael Alberts, chief editor at Ambidextrous Productions in Los Angeles.

Being able to render in the background while working in the foreground with OS X is a major plus for editors like Alberts. And that capability appears in DVD Studio Pro 1.5, which now features QuickTime performing background encoding of MPEG-2 files when you use the OS X–native app.

The Sound of Music

Video pros also appreciate what OS X offers for audio and video playback. The new OS supports multichannel audio, a particularly useful feature since a lot of video hardware supports more than two channels of audio.

"The Kona cards have six channels, so we can do 5.1 channel surround-sound audio," says Blackmagic Design's Petty. "This is really important because of all the DVD stuff that's happening on the Mac, and we now finally have multichannel audio support built right into the OS. Apple has completely redesigned the audio under OS X, and it's really nice because it's 32-bit and can take advantage of the 24-bit AES/EBU digital-audio standard for full quality."

When it comes to playing back video, Petty has been equally impressed. "OS X just keeps playing uncompressed HD video without any issues at all," he says. "We even force quit the Finder, and when the Finder launches again, the HD

video keeps playing without dropping a single frame."

OS X's Unix roots add stability and multithreading. But just as important, they create a common bond with other Unix-based systems. The television industry has been based on Silicon Graphics' Irix for the last 15 years, Petty notes, and now with the Mac having a Unix core, porting software from SGI's more expensive hardware to the Mac should be easy.

Tomorrow Never Dies

So when will video pros embrace OS X—and the Mac platform—en masse? For some, it's a question of hardware. Ambidextrous Productions' Alberts, who edits television commercials and feature films, has decided to make the switch to OS X but is waiting for OS X–native drivers. He expects a driver for his Aurora Video Systems Igniter card in August.

On the software side, many of the major applications—such as Apple's Final Cut Pro and DVD Studio Pro and Adobe After Effects—have already come to OS X. Others, such as OS X–native versions of Media 100's Media 100i and Avid Technology's Avid Xpress DV, should be out by mid-summer.

Apple's embrace of Unix has made life easier for video hardware and software makers—as well as for the video pros who will use those products on OS X. While it's too early to say how widely Macs will be used for editing and broadcast work, the big picture for Mac-using video pros has never looked better.—JONATHAN SEFF

WITH XPRESS DV, AVID SQUARES OFF WITH FINAL CUT

Avid for Digital Video

With Final Cut Pro mounting a serious challenge to Avid's position in the professional editing community, it was inevitable that Avid (800/949-2843, www.avid.com) would enter Final Cut's home turf to show Apple's upstart app how things are done. If anything, Avid's June software-only entry into the digital-video arena on the OS X platform will spark a heated debate between Final Cut supporters and Avid stalwarts.

Cutting In Avid Xpress DV brings Avid's extensive editing background to the Mac.

At the core of the $1,699 program is the same interface and workflow found throughout the Avid product line, giving seasoned Avid editors a comfortable work environment where they can start editing almost immediately. Editors can import their custom settings and keyboard shortcuts from other Avid workstations—including those running on PC platforms—into Xpress DV, allowing them to quickly personalize the program.

Like Final Cut Pro 3, Avid's latest version of Xpress DV comes with customizable real-time effects—more than 100, in fact. These real-time effects require significant processor horsepower, though, since Xpress DV does not use any additional hardware. At press time Avid's preliminary specs called for a Mac with at least a 500MHz G4 processor and OS X 10.1. As with Final Cut, all real-time effects are preview-only, so you can see them only on your computer monitor and not on an external screen—and you'll need to render them for your final output. Xpress DV also boasts eight video tracks with unlimited nesting, DV scene extraction, OMF export, EDL import and export, Unity LANshare support, and project bin compatibility with other Avid editing systems.

While you may be able to buy a Pinnacle CinéWave card so you can work with uncompressed or even high-definition video in Final Cut, that's not an option with Xpress DV, which can only edit DV. If you want better quality DV, you'll need to step up to a full-blown Avid Xpress system—both a software and hardware upgrade. You can, however, easily take an offline project from Xpress DV and import it seamlessly into a top-of-the-line Avid system for final assembly.—ANTON LINECKER

APPLE EXTENDS FINAL CUT'S CAPABILITIES WITH CINEMA TOOLS

Making the Cut

Ever since Apple (800/692-7753, www.apple.com) bought Focal Point Systems and its FilmLogic software in 2001, editors have anticipated a product like Cinema Tools. The $999 program enhances the latest version of Final Cut by adding support for film cut lists and the ability to export and import 24-frame edit decision lists (EDLs) for high-definition video projects.

The core of Cinema Tools is an OS X–native version of FilmLogic, a database system that keeps track of film Keykode, videotape time-code, and audio time-code relationships for film projects. Cinema Tools also installs a plug-in for Final Cut Pro 3, giving Apple's digital-video–editing application the badly needed ability to import 24-frame EDLs.

The Kindest Cut Cinema Tools lets editors import 24-frame edit decision lists into Final Cut Pro 3.

Cinema Tools imports telecine log files to establish the database of Keykode and time-code relationships, and then provides a batch-capture list that can be used in Final Cut Pro to capture clips. All edits performed with these clips are tracked on the basis of Keykode. Cinema Tools even sports a reverse telecine function that lets you convert the telecined video dailies from 29.97 frames per second to the film's original 24 frames per second.

After you've finalized a cut, Final Cut Pro can use a Cinema Tools plug-in to produce a film cut list. This cut list allows a negative cutter to conform the original film to your final film.—ANTON LINECKER

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With DVD Studio Pro 1.5, you can author your own DVDs—so your work is digital from start to finish. You'll be able to create full-featured DVDs with high-quality audio and video and sophisticated navigation that is fully compatible with most set-top and computer-based DVD players.

You won't, however, have to focus on learning complex DVD authoring commands. Since it's from Apple, DVD Studio Pro is designed for creative professionals—not DVD technicians.

Now DVD Studio Pro 1.5 works even better with Final Cut Pro.

Use marker points in Final Cut Pro 3 and simply export your project to MPEG 2. Final Cut Pro will generate and completely name all your chapter points. Easily import them into DVD Studio Pro and you'll have frame-accurate chapter points for your projects.

Full-featured DVD authoring.

Your DVD projects can include motion or still menus, up to 99 video tracks (each with chapter markers, multiple stories, up to nine different angles, eight audio streams and up to 32 subtitle streams), plus slide shows and multiple language tracks. DVD Studio Pro supports DVD-9 projects, so you can create DVD-Video projects that are up to 9 gigabytes in size.

Ships with the following applications:

- **DVD Studio Pro**—orchestrate all your materials in one application
- **QuickTime Pro**—convert your current QuickTime files to MPEG 2
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- **Subtitle Editor**—add subtitles to movies
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THE LATEST HIGH-END VIDEO CARDS |

Broadcast News

For video professionals, the term *broadcast quality* means nothing less than an uncompressed signal streaming over a serial digital interface (SDI) port. Thanks to several recent releases by video-card makers, uncompressed-video quality is as accessible to small production shops using Macs and Final Cut Pro as it is to large operations with Avid systems and hundreds of thousands of dollars to throw around.—MACWORLD STAFF

The Digital Voodoo HD Fury

The **CinéWave Classic** ($5,495), from Pinnacle Systems (650/526-1600, www.pinnaclesys.com): CinéWave Classic comes without bundled Final Cut and Commotion software. External connections are made through a choice of analog or digital breakout boxes, with the digital option providing a set of 10-bit SDI digital inputs and outputs. Real-time rendering with Final Cut requires a software upgrade to the RT version, while other I/O configurations may be had by adding additional breakout boxes. OS X compatibility will be available via a free upgrade in July.

The **Kona-SD card** ($3,295), from AJA Video Systems (800/251-4224, www.aja.com): AJA offers this card only for OS X. Unlike other cards mentioned here, the Kona-SD does not require a separate breakout box for operation. Its six channels of AES/EBU audio are available via a cable plugged into the back of the card. AJA has also previewed a high-definition version, the **Kona-HD** ($10,995), which is set to ship this summer. If you want to take advantage of real-time effects, the Kona-HD will require a 66MHz PCI slot—something not yet available in the current Mac lineup.

The **HD Fury** ($11,995), from Digital Voodoo (702/948-4976, www.digitalvoodoo.net): Slated for a June release, the card features real-time effects and a dedicated SDI port that simultaneously converts from high definition to standard definition. An external breakout box allows access to eight channels of AES/EBU audio. Like the Kona-HD, the HD Fury can perform real-time effects on an HD stream in future Macs capable of handling the required data rate. For standard-definition work, Digital Voodoo also unveiled the **D164RT** ($3,495) featuring 10-bit SDI I/O and six channels of AES/EBU audio.

UP CLOSE WITH APPLE'S NEW DISPLAY |

Cinema's Scope

What a difference an inch makes. The **Apple Cinema HD Display** is just an inch larger than Apple's original Cinema Display, yet the new 23-inch flat panel packs 40 percent more pixels into the extra space. With 1,920-by-1,200-pixel resolution, the $3,499 display provides enough clarity and sharpness to let you view and edit high-definition TV (HDTV) content in its native resolution. The new model hooks up to your Mac via an Apple Display Connector cable that also powers the display. The new Cinema HD Display also features a 16:10 aspect ratio, making it wide enough to easily view two Web pages or a QuarkXPress spread with palettes. But at 19.2 inches high by 29.2 inches wide by 7.3 inches deep, Apple's display squeezes that big-screen feel into a small-screen space.—JONATHAN SEFF

DIGITAL-VIDEO BEAT

HARDWARE

Displays

An LCD video monitor from Sharp Electronics (800/237-4277, www.sharp-usa.com): The **LC-28HM2** is a 28-inch display with widescreen high-definition resolution and 1,280-by-768 component video inputs. It's designed to provide optimal viewing for video sources from HDTV signals and DVDs to XGA, SVGA, and VGA computers ($16,995).

Projectors

A series of projectors from Epson (800/442-1977, www.epson.com): The 18.3-pound **Epson PowerLite 8200i** ($7,859) has a brightness rating of 3,500 ANSI lumens, XGA-native 1,024-by-768-pixel resolution, and a contrast ratio of 600:1. The **PowerLite 730c** ($3,999) has a brightness rating of 2,000 ANSI lumens, while the **PowerLite 720c** ($3,499) has a brightness rating of 1,500 ANSI lumens.

Storage Devices

New disk arrays from Medéa (888/296-3332, www.medea.com): The five-drive **VideoRaid RTS** is designed for digital-content–creation apps, including nonlinear video editing, 2-D and 3-D animation, compositing, and game development. It's available with a 160GB ($2,799), 320GB ($3,299), or 640GB ($4,999) capacity.

SOFTWARE

Editing Software

VideoClix 2.0, from Eline Technologies (604/688-8889, www.elinetech.com): The update to the interactive video-editing software includes new click, rollover, and time-triggered actions, messaging for third-part application support, HTML-independent interactivity, faster object tracking, canned effects, full OS X support, and MPEG support ($499; upgrade, $99).

Plug-in Software

Magic Bullet Suite 1.0, from The Orphanage (323/933-8262, www.theorphanage.com): The suite features five Adobe After Effects plug-ins, including Magic Bullet, which converts digital video to 24 frames per second while reducing some of the artifacts present in the digital-video footage ($995 for support of 720-by-486 and 720-by-576 resolutions; $1,995 for no-resolution-limit version).

Utility Software

CatDV Pro, from Square Box Systems (44 1789 730898, www.squarebox.co.uk): The multiuser version of Square Box's media-cataloging and video-logging utility runs in OS 9 and OS X. It will ship by September 2002 (download, $80).

Videogram Creator, from The Right Bits (510/770-5700, www.videogram.com): The software combines text, graphics, and as much as five minutes of audio/video content into a compressed, self-contained HTML file, letting you create and send streaming-video e-mail messages ($50).—COMPILED BY PHILIP MICHAELS

MAC SOFTWARE BARGAINS

60

ESSENTIAL UTILITIES THAT WON'T BREAK THE BANK

Let's face it—computers aren't cheap. After spending as much as several thousand dollars on hardware, you still need to buy plenty of software that doesn't come installed on your hard drive. But although you may not be able to live without big-ticket items from the Adobes and Microsofts of the world, not everything that runs on the Mac will set you back a pretty penny.

We've collected 60 of the best—and coolest—inexpensive or free applications available for the Mac: everything from essential OS X system utilities and networking and database apps to audio, video, and imaging software. You're sure to discover some hidden gems in our guide.

ILLUSTRATIONS: WWW.ANDYMARTIN.UK.COM

Audio/Video Applications

BTV Pro 5.4 9X

♦♦♦♦½; Ben Software, benbird@kagi.com, www.bensoftware.com; $45

BTV Pro is a fully Carbonized video-capture, video-editing, and stop-motion–animation application. While this app's editing functions can't compare with those of programs such as Final Cut Pro, its time-lapse and stop-motion capabilities make it a truly versatile tool. Creating a series of still images was a snap, and taking those stills and creating an animated QuickTime movie was even easier. BTV Pro also boasts a motion-detector option, which limits recording to when the program senses motion—useful for surveillance videos, for example; an optional time stamp can be applied to video captured this way. BTV Pro works with any Mac-compatible video-input source, including capture cards, TV cards, and FireWire and USB video cameras.—ANTON LINECKER

Cellulo X

♦♦♦♦; Atvaark Dev., cellulo@cellulo.info, www.cellulo.info; free

Cellulo lets you create a playlist of video files that you can then play full-screen on your computer. This program is particularly useful when you want to play back segmented video files. Rather than tying segments together in a video-editing program, you simply put the files in the proper order—Cellulo will play across the breaks. Program navigation is easy, as is customizing the viewer—you can add entire folders of video with the Add button or by dropping the clips on the program.

Cellulo also plays nice with the Avi2Mov utility, allowing Mac users to import and watch downloaded DivX files. For a 1.0 release, this program is quite solid, and you can't beat its price.—ANTON LINECKER

Joe's Filters 3.0 for Final Cut Pro 9X

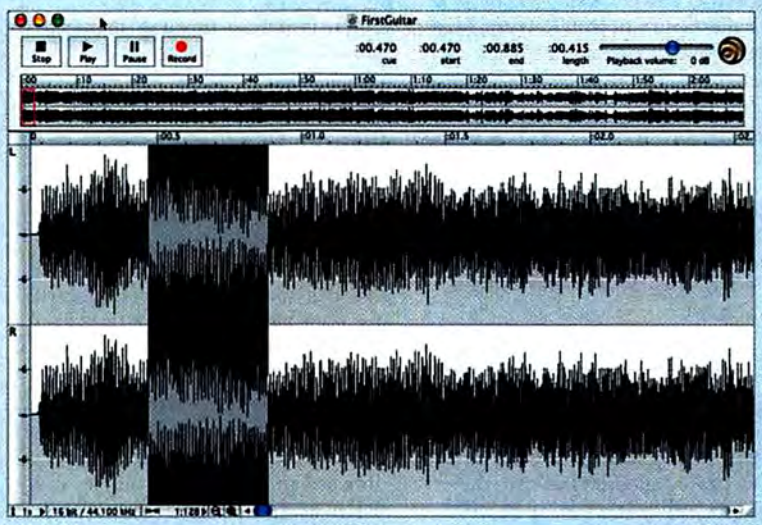
♦♦♦♦♦; Joe Maller, joe@joemaller.com, www.joemaller.com; $95

Joe's Filters for Final Cut Pro is a set of 24 plug-ins created with Final Cut Pro's FXScript. Unlike many After Effects plug-ins (which haven't yet made the transition to OS X), they work in both OS 9 and OS X. Some of the plug-ins are improvements on existing Final Cut Pro filters: Joe's De-Interlacer, for example, renders twice as fast as the Final Cut Pro version and has features such as field-doubling. Original plug-ins include Joe's Blur Effects, an interesting filter that can target RGB and YUV channels separately to aid in blue-screen and green-screen compositing, and Joe's Time Bender, which lets you control a clip's speed and even reverse video midstream. Other noteworthy filters are Joe's Soft Shapes, Joe's Flexi-Smear, and Joe's Threshold and Posterize. What makes these plug-ins truly special is that they're not encoded, so you can load each one into Final Cut Pro's FXBuilder to see how the plug-in was built. On Joe's Web site, you can find an FXScript reference, which shows you how to build some effects of your own.—ANTON LINECKER

Pro Tools Free 5.0 9

♦♦♦♦½; Digidesign, 650/731-6198, www.digidesign.com; CD, $10; download, free

Pro Tools Free, the sole OS 9–only application in this group, definitely justifies a reboot into OS 9. Like TC Works' Spark ME, Pro Tools Free is an introduction to a family of audio products. This version provides eight tracks of real-time audio, 48 MIDI tracks, and industry-standard editing and mixing capabilities—it's a powerhouse for musicians and video producers alike. You can output a project from Final Cut Pro via Open Media Framework (OMF), import it into Pro Tools Free, and do some sound "sweetening" with Digidesign's free OMF Tool app. When you import a project this way, the audio clips will arrange themselves in Pro Tools Free's timeline as they were in Final Cut Pro, making your work much easier. In addition, Pro Tools Free lets you edit and mix your audio to picture. Once you've finalized your audio, you can export it back to Final Cut Pro to finish the project.—ANTON LINECKER



Sound Advice Similar to programs that cost much more, Sound Studio offers an easy-to-navigate, two-channel editing interface.

QTBatchExporter 1.0 9X

♦♦♦½; Channel D, 609/393-3600, www.channld.com/software.html; $24

QTBatchExporter is a QuickTime helper application that lets you batch-compress sets of video files instead of compressing them one at a time with Apple's QuickTime Pro. In OS 9, QTBatchExporter offers background conversion with a choice of system response, so you can either devote your entire CPU to the compression process (for the fastest results) or surf the Internet while compressing your video for a Video CD in the background (an option OS X users take for granted). Additional capabilities include drag-and-drop conversion of files and folders and accurate estimation of the time remaining before a set of conversions is finished.—ANTON LINECKER

Slick Transitions and Effects, Collections One and Two 9X

♦♦♦½; Gee Three, 650/328-2359, www.geethree.com; $30 each, $50 for both

Final Cut Pro is not the only application with plug-ins available on the Internet. Each Slick collection is a set of roughly 50 transition and effect plug-ins for iMovie 2 that greatly expand that program's editing capabilities. They can add a level of sophistication to your projects—especially if stepping up to Final Cut Pro isn't for you. The Slick Sampler, a collection of nine transitions and effects including the Barn Door, Burst, and Sweep transitions and the Film Noise, Solarize, and X-ray effects, is available as a free download.—ANTON LINECKER

Sound Studio 2.0 9X

♦♦♦♦; Felt Tip Software, 610/293-0512, www.felttip.com; $50

Sound Studio is another two-channel audio editor targeted at sound enthusiasts who record their own sound or want to manipulate existing audio. It has a very intuitive user interface, and it provides a familiar waveform editing environment and a healthy set of effects and filters, including Adjust Pitch, Compressor, Flanger, Reverb, DC Offset, and Noise Gate. It lets you record sound with a variety of USB, PCI, and built-in audio-input sources.—ANTON LINECKER

Spark ME X

♦♦♦♦; TC Works, [49] 40 5310830, www.tcworks.de; free

Spark ME is a free introduction to the Spark line of audio applications. This OS X–only two-track editor allows direct recording and provides the ability to import and manipulate any QuickTime-compatible audio file. It's similar in many ways to Sound Studio, but it has fewer default filters that you can apply to audio. Spark ME includes the Normalize, Resample, >>

Fade, Gain Control, Reverse, Invert, and Spark One Band EQ plug-ins. It supports the popular VST plug-in format—unusual in a free application—and lets you open a QuickTime movie and edit the sound track to picture.—ANTON LINECKER

StreamCatcher X

★★★½; Bombich Software, www.bombich.com; free

If you listen to Internet radio, there may be times when you'd like to save what you're listening to—an interesting interview or a great new song, for example. StreamCatcher (a graphical interface for the free Unix utility streamripper, which is bundled with the StreamCatcher download) can help you record the streaming audio to your hard drive. StreamCatcher also plays nice with iTunes—you can drag an Internet radio station's URL information from iTunes to StreamCatcher. By enabling StreamCatcher's Local Relay option, you can also listen to the stream you're recording. Here again, StreamCatcher works in conjunction with iTunes; the relayed audio is played through that program.—ANTON LINECKER

Tattoo 1.1 X

★★★★; Feelorium, info@feelorium.com, www.feelorium.com; $23

Tattoo is a QuickTime media-skin editor that allows you to customize your audience's viewing experience. Need a multimedia greeting card for your video company? Just drop a QuickTime movie and a media-skin image of your company logo into Tattoo's work area. You can even customize the buttons that control playing, stopping, stepping forward and backward, volume, and URL access. And because Tattoo exports QuickTime movies, your creations can be played on Macs (with OS 8 and later) and PCs running QuickTime 5. Tattoo's interface is quite straightforward and can be mastered in minutes. And at $23, it's a nice alternative to Totally Hip Software's much more expensive LiveStage Pro 3 (*Reviews*, February 2002) if all you're looking to do is create QuickTime skins.—ANTON LINECKER

CatDV 2.5 9X

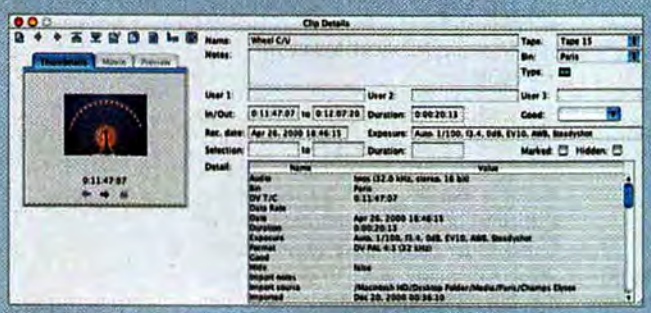
★★★★½; Squarebox Software, [44] 1789 730898, www.squarebox.co.uk; $80

Sometimes just keeping track of all your video material can be a challenge, especially if you're a filmmaker with hours of footage. With CatDV, video producers have a new way to catalog and work with video.

CatDV can import video clips captured by another program, such as Final Cut Pro, or it can capture the video on-the-fly via FireWire. After the video is imported or captured, CatDV can subclip footage, using DV start/stop detection or frame-based scene-change detection. It can also import non-DV video formats such as MPEG-1, AVI, Sorenson, and any other QuickTime-supported format. Audio files and still images are also supported.

Within the app, you can view all your cataloged clips by thumbnail or list, play the video, and make comments and annotations. With CatDV's flexible filtering, you can quickly search through all your cataloged clips to find the shot you want. If you need to decide on the best take of a particular shot, you can group all the takes and watch them back to back. If you use CatDV to log and evaluate your raw footage before you start editing, you can output a batch-capture list, for Final Cut Pro or Premiere, of only the clips you need. You can even adjust time-code values if you want to recapture from a program tape rather than the originals.

CatDV can import CMX edit-decision lists from other programs and instantly build a cuts-only preview edit with clips stored in its database. This is useful when the original high-resolution media are offline and you want to see how a project looks. Since CatDV stores its video files in the Photo-JPEG format, you can have many hours of material cataloged on your computer without eating up too much valuable hard drive space.—ANTON LINECKER



It's in the Details In CatDV's Clip Details window, you add comments to your video clip and choose which thumbnails you want to present.

System Utilities and Finder Enhancements

ASM 2.0 X

★★★★½; Frank Vercruesse, frank@vercruesse.de, http://asm.vercruesse.de; free

ASM brings OS 9's Applications menu to the right side of OS X's menu bar, where it displays the icon of the active application. Click on the icon, and you get a menu that lists all open applications; select the one you want, and it becomes the active application. You can also show or hide applications—ASM is one of the fastest ways to keep track of open programs and switch between them in OS X.—TED LANDAU

BatChmod 1.3 X

★★★★; Arbysoft, renaud@mac.com, http://homepage.mac.com/arbysoft; free

OS X's ownership and privileges can cause big headaches. BatChmod can alleviate the pain. It gives you precise, drag-and-drop control over single files and entire folders. This intuitive app lets you easily change who owns a file and who can read, write, and delete it. BatChmod can even empty the Trash if it contains locked files (an action that might otherwise require gaining root access—always good to avoid if possible). Keep in mind that changing file and folder ownership can seriously mess up a system, so take the program's warnings seriously.—JONATHAN SEFF

Boot CD 0.2 X

★★★★; CharlesSoft, csrstka@mac.com, http://homepage.mac.com/csrstka/; free

BootCD almost magically does something that's otherwise all but impos-

sible to do in OS X—create a bootable CD that gives you access to the desktop and the Dock, complete with your personal selection of applications. It's ideal for creating a customized Emergency Startup CD. It's listed as an "unfinished" product, but it definitely works. It doesn't provide much documentation, though; for more help, especially on getting your hard drive to mount when booting from the CD, visit www.macfixit.com/library/usingbootcd.shtml.—TED LANDAU

Carbon Copy Cloner 1.2 X

♦♦♦♦; Bombich Software, www.bombich.com; free

Need to copy your OS X startup volume to a different hard drive? Forget dragging and dropping—OS X includes numerous invisible files that won't make that kind of transition. Instead, use Carbon Copy Cloner, a simple utility that harnesses the built-in power of OS X's Unix layer to make moving or backing up a volume as easy as clicking on a button.—JASON SNELL

Default Folder 1.5 9X

♦♦♦♦; St. Claire Software, support@stclairsoft.com, www.stclairsw.com; $35

Default Folder makes navigating Open and Save dialog boxes a lot more pleasant. For starters, Default Folder maintains lists of recently visited and favorite folders—just click on a selected folder, and the Open or Save listing shifts to display that folder's contents. Default Folder also remembers the item you selected the last time you visited a folder and automatically reselects it when you return. You can even use the program to delete files without having to go to the Finder. Default Folder is especially welcome in OS X, where there is currently nothing that compares with it.—TED LANDAU

DragThing 4.3 9X

♦♦♦♦½; James Thomson, james.t@kagi.com, www.dragthing.com; $25

DragThing combines the features of OS 9's Application menu and Launcher in one utility—and then it outperforms both. Many of its fans use it as an alternative to OS X's Dock. You can create as many "Docks" as you like, have them all on screen at the same time, and windowshade each Dock to a minimum when you want it out of the way. Items in Docks can be divided into categories (such as applications and documents), and you have almost unlimited control over a Dock's appearance.—TED LANDAU

FruitMenu 1.5 X

♦♦♦♦; Unsanity, 877/700-7056, www.unsanity.com; $7

FruitMenu is for those who are not satisfied with the choices in OS X's Apple menu. With FruitMenu, you can remove existing Apple menu items or add new ones—for example, one that shows your current IP address. Perhaps the best item is Fruit Menu Items Contents. Add it, and whatever you decide to place in the Contents folder is shown in the Apple menu. For example, put an alias of your hard drive there, and you'll get a hierarchical menu item that lists the full contents of your drive. You could easily do this in OS 9, but now you can do it in OS X, too.—TED LANDAU

LaunchBar 3.2 X

♦♦♦♦♦; Objective Development, office@obdev.at, www.obdev.at; $20

LaunchBar must be seen to be believed. Accessible from your menu bar, it can find any file almost instantly, even if you don't remember its exact name. Just type any letters you believe are in the name, and LaunchBar will list all potential matches. When we typed **aw**, AppleWorks was the first program to be listed—only LaunchBar could've figured this out. The more you use it, the better its guesses become, and of course you can launch any listed item from LaunchBar. As a bonus, LaunchBar includes its own Application menu.—TED LANDAU

MacReporter 1.1 X

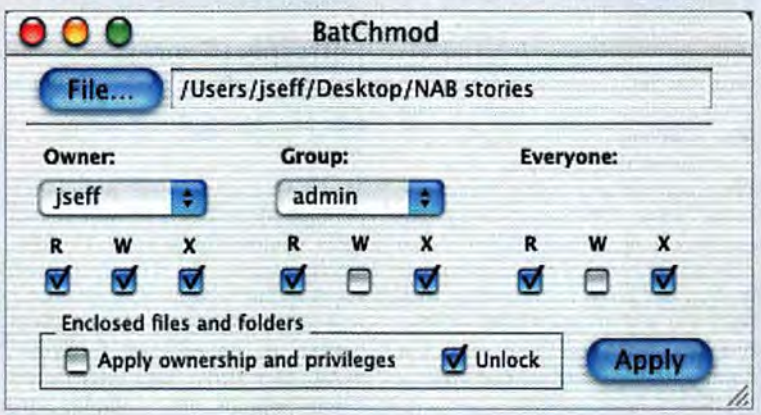
♦♦♦½; Inferiis, support@inferiis, www.inferiis.com; $12

MacReporter grabs headlines from all over the Web and then puts them at your disposal in OS X's Dock. You go through MacReporter's long list of plug-ins and choose the news sites you visit frequently; the application will check them for new stories at regular intervals and alert you to new items via sound, a number on the icon, or both. Select a headline in MacReporter's contextual menu, and the corresponding story will open in your browser. It's an easy-to-use tool that'll give news junkies a much needed fix; it'll be even better when Wilfried de Denterghem, MacReporter's author, releases a forthcoming utility that lets you create your own headline-grabbing plug-ins.—JASON SNELL

MaxMenus 1.1 X

♦♦♦♦; Proteron, 402/932-3894, www.proteron.com; $30

MaxMenus is a deceptively simple utility that installs customizable menus in the four corners of your Mac's screen. Each menu can be configured to contain any number of items—including lists of specific files, applications, and folders; open applications (as in OS 9's Application menu); recent applications or documents; system-preference panels; and mounted volumes. Menus and menu items can easily be assigned hot keys, and MaxMenus lets you drag and drop files to copy or move them into a menu's spring-loaded folders. With MaxMenus, Proteron has taken a smart idea and filled it out with plenty of hidden power.—RICK LEPAGE >>



Control Freak BatChmod lets you quickly change who has access to—and control over—every file on your hard drive.

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Up for a Movie? When you want to see the latest flick, Watson's Movies module tells you what's playing, as well as where and when. It can even show you movie trailers.

MOX Optimize 1.7 X

●●●½; InfoSoft, infosoft@mac.com, http://fly.to/infosoft/; $11

MOX Optimize invokes Unix's update_prebinding command, which can improve your Mac's performance (OS X's Installer also does this when it optimizes your software). There are other prebinding utilities in OS X, but what makes MOX Optimize stand out from the crowd is how much more it does. MOX Optimize can also speed up your network connection, disable start-up files, and delete unneeded language-support files to save hard-drive space.—TED LANDAU

Perfboard 1.2 X

●●●½; Pepsan and Associates, www.pepsan.com/contactus.html, www.pepsan.com; free

Perfboard monitors your system performance and keeps you informed via a continually updated readout. If your Mac suddenly starts acting as if it were swimming through molasses, Perfboard can help isolate the precise cause. From CPU usage to system load to virtual memory "page outs" to network I/O stats, Perfboard reports it all in one convenient display, with both text and graphs. Other utilities provide subsets of these stats, but none puts it all together as well as PerfBoard.—TED LANDAU

Pseudo 1.2 X

●●●●; Brian Hill, brianhill@mac.com, http://personalpages.tds.net/~brian_hill; free

Pseudo will save you time when you want to modify a file owned by the root user. For example, suppose you want to modify a text file in OS X's System folder (not that we're necessarily recommending this). You could log in as the root user or, if you're familiar with Unix commands, you could give Terminal a whirl. You might even have success by temporarily changing the file's ownership. But if you want to do it as quickly and painlessly as possible, just drag and drop your text editor on the Pseudo icon. The editor will launch as if owned by root, and you'll be permitted to make changes to documents opened within it.—TED LANDAU

Retrospect Express Backup 5.0 9X

●●●●; Dantz, 925/253-3000, www.dantz.com; $49

Many Mac users were postponing the upgrade to OS X because Retrospect couldn't back up and restore OS X volumes. But with Retrospect Express, they now have an affordable way to back up a few Macs without paying for unnecessary features—SCSI tape-drive and Retrospect Client support, for example. This new version includes many improvements to previous versions, including the ability to back up Mac files larger than 2GB and to work with all the writable optical drives currently shipping in Macs. (For a full review of the entire Retrospect Backup 5.0 suite, see *Reviews*, elsewhere in this issue.)—ADAM C. ENGST

SharePoints 2.0 X

●●●●●; Michael Horn Software, spamnot@mac.com, http://homepage.mac.com/mhorn/; free

SharePoints enhances OS X's file sharing by letting you set the sharing status of individual folders. In OS X, a guest user typically has access only to your Public folder. With SharePoints, you can give a guest access to your Music or Pictures folder, for example. OS 9 has always worked this way, but OS X hasn't—at least not at the Finder level. Like several of the OS X utilities listed here, SharePoints takes a feature that's part of OS X's Unix core and gives it a user-friendly Aqua-based interface.—TED LANDAU

SmartWrap 2.1 9X

●●●●; Selznick Scientific Software, s3sales@selznick.com, www.selznick.com; $18

SmartWrap will bring a welcome sigh of relief if you spend a lot of time copying text from e-mail messages and pasting it into other applications. This program cleans up text, eliminating stuff such as > characters and hard returns. Especially useful is SmartWrap's ability to clean text on the Clipboard. Just copy your selection and click once or twice in SmartWrap, and your text is ready for pasting wherever you want. The OS X version also works via the Service menu.—TED LANDAU

Snapz Pro 2.0 and 1.0 9X

●●●●½; Ambrosia Software, 800/231-1816, www.ambrosiasw.com; OS 9 version, $40; OS X version, $49; without QuickTime movie capture, $29

Snapz Pro is an essential tool for those who frequently need to capture screens. OS X's ⌘-shift-3 and ⌘-shift-4 snapshots may be adequate for some (forget the nearly useless Grab utility), but they don't come close to what you can do with Snapz Pro. Use it to save files in a variety of formats, even QuickTime movies. Scale, crop, overlay watermarks, autoselect windows,

and more. Snapz Pro eliminates almost all of the need for further editing in another application. If it had a few other editing tools, it could eliminate even more.—TED LANDAU

Tinker Tool 2.1 X

♦♦♦♦; Marcel Bresink Software-Systeme, osxinfo@bresink.com, www.bresink.de/osx; free

TinkerTool is the key to accessing an assortment of OS X's hidden preferences. It can reveal files that are normally invisible in the Finder (such as Unix files and directories), enhance your ability to choose which fonts and font sizes use OS X's font smoothing, and more. OS X has built-in settings that let you do all this, but Apple didn't provide a user interface for them—TinkerTool fills that gap.—TED LANDAU

Watson 1.5 X

♦♦♦♦; Karelia Software, accounting@karelia.com, www.karelia.com; $29

Watson is a "think different" way of viewing Web content. Its author calls it a "desktop Web productivity application." You'll call it fantastic. You can use Watson to look up zip codes, airline schedules, stock prices, TV listings, movie times, and more. Searching via Watson's consistent interface is much more convenient than firing up a standard browser to find information on the Web. And you can customize Watson to remember your personal preferences (such as theaters in your area or your local cable channels) on your return visits.—TED LANDAU

WindowShade X 2.0 X

♦♦♦♦½; Unsanity, 877/700-7056, www.unsanity.com; $7

WindowShade X is a one-trick pony with one great trick—bringing OS 9's windowshade effect to OS X. Double-click on a window's title bar, and up it rolls. Windowshading is often better than minimizing windows to the Dock, especially when you want to quickly see what's behind a window. If you don't like windowshading, you can set windows to become transparent or completely hidden. You can even have your cake and eat it, too, by using the minimize button for one method and the title-bar double-click for another.—TED LANDAU

X Font Info 1.0 X

♦♦♦½; Vincent Software, vjalby@kagi.com, http://homepage.mac.com/vjalby/; free

X Font Info fulfills yet another "I wish OS X could do what OS 9 does" wish. In OS 9, double-clicking on a font suitcase in the Finder reveals the contents of the suitcase. Double-clicking on a font file displays a sample of the font. If you try the same things in OS X, you get error messages. But if you instead drag a font file to the X Font Info icon, you can see a sample of the font (or fonts) in all sizes and installed styles. Even better, by selecting X Font Info from the Open With Application option in a font file's Show Info window, you can get X Font Info to launch whenever you double-click on a font. X Font Info's one weakness is that it does not accurately display Unicode fonts.—TED LANDAU

Zingg 1.1 X

♦♦♦♦; Rainer Brockerhoff, rainer@brockerhoff.net, www.brockerhoff.net; free

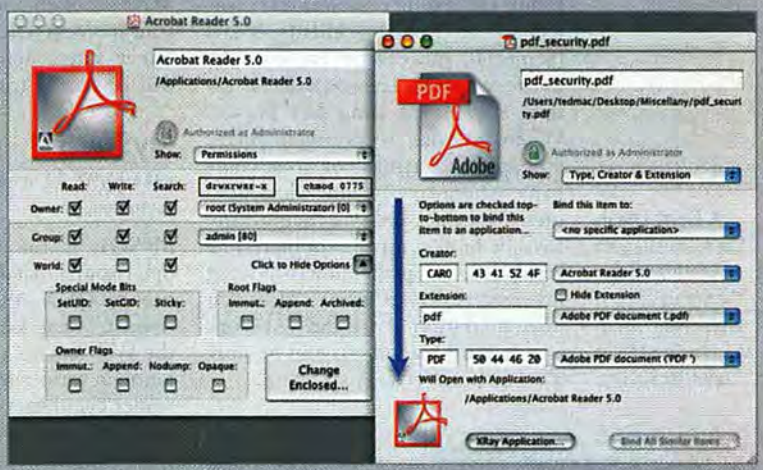
Zingg adds a contextual menu item that lists every application the OS believes can open a selected document. Yes, you could get the same list from Show Info's Open With Application listing, but Zingg is a great shortcut. Even better, Zingg can be customized so that certain applications always appear in the list (useful for utilities, such as BBEdit, that can open many files they don't officially support) or never appear in the list. It's even smart enough to list OS 9–only applications only if Classic is running.—TED LANDAU

XRay 1.0 X

♦♦♦♦♦; Rainer Brockerhoff, rainer@brockerhoff.net, www.brockerhoff.net; $10

XRay is a much enhanced version of OS X's Show Info command. For starters, it solves one of OS X's more frustrating problems: an inability to move or delete a file because you don't have sufficient permission. The Show Info window *does* provide a way to view and edit a file's permissions (called *privileges* in Show Info)—if you're the owner of the file. But too often, it's precisely because you don't own the file that you have the problem. XRay bypasses this catch-22 and lets you easily change ownership—or any other file attribute—as long as you are an administrator. It gives you access to all Unix permissions (read, write, and execute), not just the subset that Show Info includes.

When you double-click on a document from the Finder, does it open in the wrong application or refuse to open at all? Show Info's Open With Application options can resolve this dilemma, but once again, XRay goes the extra mile. With XRay, you can modify a file's Type and Creator codes. These carryovers from OS 9 link documents to applications without requiring that the document have a file-name extension. And you don't even need to know what the codes are: XRay's pop-up menus include every application on your drive.



Get to the Root of It When it comes to editing file attributes—from permissions to Type and Creator settings—XRay outpaces OS X's Show Info by several laps.

Just select the program you want, and XRay will fill in the code.

XRay can also create Unix symbolic links and assign colored labels to files (an OS 9 feature not included in OS X). And it's extensible via plug-ins, so you may be able to add functionality to the program. If you'd rather not use Terminal, XRay is the way to go.—TED LANDAU >>

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Networking, Database, and Business Applications

AtWork 2.4 X

●●●●; IGG Software, 909/328-0712, http://home.earthlink.net/~iangg/; $9

AtWork is a time and billing solution for designers, consultants, and anyone else who needs to track and bill for projects and time. This application takes full advantage of OS X features such as sheets, live data updates in the Dock (the clock glows green when you're billing for time), and a fully customizable toolbar. You can predefine clients, events (projects), and even currencies. An optional timer alerts you when a certain amount of time has passed. When it's time to create invoices, you specify settings for your company, whom to pay, and when payments are due, and you then hit the Invoice button on the toolbar. The result is a professional-looking invoice, ready to print. Although documentation is light, AtWork is a feature-loaded bargain at only $9.—ROB GRIFFITHS

A Tight Leash The main eTraquer window shows the status of each employee. "Susan M." is in a meeting until 10:30 a.m.

eTraquer 1.5 9X

●●●●½; Network 23 Canada, 800/231-0062, www.network23.ca; site license, $50

eTraquer is an office in-out board for Mac users. One machine on the network runs the ePlanet server software, and users run the eTraquer client. Launch the program, enter the server's address and your name, and you're marked as "in." When you're unavailable, change your status to "out" and then add a reason, return time, and optional note. Administrative users can broadcast messages or change the status of other users. The eTraquer interface is very easy to understand and requires almost no training. eTraquer does only one thing but does it quite well.—ROB GRIFFITHS

MaxBulk Mailer 2.6 9X

●●●●½; Max Programming, support@maxprog.com, www.maxprog.com; $35

MaxBulk Mailer handles high-volume e-mail tasks with ease. Via the program's tabbed-window interface, you compose messages, specify recipients, enter account settings, preview messages, and view logs. Messages can contain placeholders that are replaced with values at send time. User lists can be imported and exported, and messages can be saved for future use. As the battle against spam rages, the legitimate need for tools such as MaxBulk Mailer is often not understood. But if your business relies on e-mail for customer interaction, MaxBulk Mailer may be worth a trial.—ROB GRIFFITHS

MySQL 3.2 X

●●●●; MySQL AB, info@mysql.com, www.mysql.com; free

MySQL is the most widely used open-source database server—and it runs on OS X. Although documentation isn't included with the program, the Web site has excellent documentation in various formats and includes reader comments. MySQL's interface won't win any design awards, but this powerful and flexible database server is available at a great price—free. Combine MySQL with the PHP scripting language, and you can turn your OS X Mac into a tool that allows you to create and serve dynamic Web pages. If you visit Marc Liyanage's site (www.entropy.ch/software/macosx/), you can download double-click installers for both MySQL and PHP.—ROB GRIFFITHS

OmniOutliner 2.0 X

●●●●; The Omni Group, 800/315-6664, www.omnigroup.com; $21

OmniOutliner 2.0 is a free-form outliner that can help you track projects, manage to-do lists, take notes, or create a book outline. You start with a blank white window and add text and columns as necessary. As the outline builds, you can indent subitems under lead items, group tasks together, and add comments. Columns can be defined for text, duration, date, and more. Reorganizing your outline is as easy as dragging the items around within the list. When your outline is done, you can easily export the data to plain text, RTF, or HTML.—ROB GRIFFITHS

phpMyAdmin 2.2 X

●●●●; phpWizard.net, www.phpwizards.net; free

phpMyAdmin is a browser-based tool for creating and managing MySQL databases—it adds a browser-based front end to the command-line–only MySQL interface. It supports all standard MySQL functions and provides easy point-and-click access for basic tasks such as browsing, selecting, inserting, and deleting records. It also lets you easily view database schemata and import and export data to and from text files. phpMyAdmin won't help you learn MySQL, but if you already use it, phpMyAdmin can make managing your databases much easier. Installing phpMyAdmin requires a basic understanding of the Terminal application and Unix.—ROB GRIFFITHS

PTHStockTicker 1.0 X

●●●●●; PTH Consulting, pthstockticker@pth.com, www.pth.com; free

PTHStockTicker is one of the best stock trackers available, and it's free. Launch it, and a rolling ticker appears in your menu bar. Click once on the ticker to activate the program (it has no Dock icon, in keeping with its minimally intrusive style), and you can edit the preferences to control the stock list, the display style, the number of factoids displayed about each stock, and the speed at which the ticker scrolls. A double-click on the ticker display brings up a window showing all stocks at once. Elegant and easy to use, PTHStockTicker is the perfect workday companion.—ROB GRIFFITHS

Sambucus 2.0 9X

★★★★½; Logiciels Malus Softwares, logiciels.malus.softwares@sympatico.ca, www3.sympatico.ca/fuzzies/; $20

Sambucus is a project-tracking program for anyone who bills by the hour. Use Sambucus to create projects and tasks, set unique billing rates for tasks within a project, track task time, add multiple notes to projects and tasks, and quickly generate reports. You can also define documents as "activation files" for tasks. When one of these documents is dragged onto Sambucus's floating timer window, the clock starts for the associated task. Reports are generated by an XML parsing system, so you can easily define and create customized versions to meet your own needs.—ROB GRIFFITHS

chartConstructor 1.0 X

★★★½; headshack, support@headshack.com, www.headshack.com; $30

chartConstructor is a simple program for constructing PERT and Gantt charts. To create a Gantt chart, enter a description of the task, and then click and drag in the timeline area to set the duration. Click anywhere in the bar that's created, and the percentage of completion is established. Dependencies between tasks are created by ⌘-dragging from one task to another. chartConstructor is short on documentation, and its features don't compare with those of high-end project-management packages, but if all you need is a quick chart, it may be the perfect tool for the job.—ROB GRIFFITHS

Sharity 2.6 X

★★★½; Objective Development, office@obdev.at, www.obdev.at; hobbyist version, free; home license, $50

Sharity provides a CIFS (Common Internet File System) browser in the Finder, making browsing and using shared volumes from most versions of Windows as easy as using local files. Although OS X has a built-in capability to see Windows volumes (via Connect To Server and a *smb://* string), Sharity provides true Finder integration. There are some limitations (such as no support within the Classic environment), but for many users, Sharity can provide a painless method of accessing Windows volumes. A hobbyist version is free; other license costs vary depending on usage.—ROB GRIFFITHS

SnapTalk 2.0 9X

★★★½; Glass Bead Software, 978/263-9956, www.glassbead.com; $24 and higher

SnapTalk is an IM (instant messaging) program designed to improve your company's internal communications. Unlike free Internet-based IM programs, SnapTalk chats take place inside, not outside, your local network. This means higher security and less load on your Internet pipeline. SnapTalk has a lot of nice features, including easy file transfers (with resource forks), groups, predefined responses, and a message logger that records messages received while you're away. SnapTalk supports every Mac OS from 7.5 through X, so older machines aren't left out of the conversation loop.—ROB GRIFFITHS

Speed Download 1.8 9X

★★★★½; YazSoft, info@yazsoft.com, www.yazsoft.com; $20

Speed Download is a useful tool if you have a high-speed Internet connection. It accelerates your downloads by opening multiple connections to the download site and then joining together the resulting pieces. If the server and your connection have extra bandwidth available, the result is a much faster download. For example, downloading a 75MB demo from Download.com resulted in an average speed of 74K per second on a cable modem. Downloading the same demo with Speed Download, set at six connections, resulted in an average of 174K per second, more than twice as fast.—ROB GRIFFITHS

SQL4X Manager 2.0 Basic (MySQL Edition) X

★★★★½; MacOS Guru, www.macosguru.de/us/; $49

SQL4X Manager is an OS X–native MySQL database manager. The package offers three primary user areas: a database navigator for creating users, tables, indexes, and databases, as well as for viewing database schemata and data; a DBA tool that provides a ton of information about your databases and tables and allows editing of the table values; and a SQL console through which you can execute various queries on your databases. With its elegant interface, intelligent use of OS X features such as sheets, and thorough coverage of MySQL commands, SQL4X Manager is a solid database-management tool.—ROB GRIFFITHS

StickyBrain 2.0 9X

★★★★½; Chronos, 435/615-7335, http://chronos.iserver.net/; $40

StickyBrain could be described as "Stickies with superpowers," but that doesn't begin to explain everything it can do. StickyBrain is more of a brain assistant. It has calendars, alarms, categorizable stickies, checkbox buttons, text-cleanup tools, and search features—grasping everything StickyBrain can do for you will have your hands full.

StickyBrain ships with nine predefined information categories (Calendar, Documents, Friends, Miscellaneous, Passwords, Receipts, Tasks, and Unfiled). Each category has a predefined set of associated settings. For example, you can choose a window-background color, the size and formatting of text, default text to be added when a new sticky is created, and sticky size. If you come across a type of information you'd like to start collecting, just create a new category and start pasting data.

To get a feel for all the things that StickyBrain offers, open its Sticky Browser and select All Categories. Chronos has included a number of utility stickies with information on everything from popular baby names to world time zones to U.S. zip codes organized by state. By looking at the examples, you can get a feel for the various ways you can store your information (see "Total Utility").

Total Utility StickyBrain's included utility stickies will give you ideas about different ways you can store information.

But the real power of StickyBrain shows through when you begin to organize your data. An included contextual menu extension lets you grab text from most OS X–native applications (text in other applications must be copied and pasted). The same contextual menu also lets you search the StickyBrain database for selected text or look up Web passwords you've stored. Once data is stored in a sticky, contextual menus in StickyBrain let you set alarms, reclassify the sticky, and more.

As your collection of information grows, Sticky Browser may become the StickyBrain tool you use most. Type a few letters of the phrase you think you're looking for, press return, and then browse the results until you find exactly what you wanted.

It can take some time to adjust to the StickyBrain interface, but it's time well spent. We are inundated with information on a daily basis, and StickyBrain is an excellent tool for keeping track of it all.—ROB GRIFFITHS

>>

60 MAC SOFTWARE BARGAINS

Imaging Applications

BetterHTMLExport 1.6 X

♦♦♦½; Simeon Leifer, www.droolingcat.com; free

iPhoto is a fine free tool for managing your photos, but its built-in Web-page–export features are extremely limited. Fortunately, BetterHTMLExport gives you more control over your Web-based image libraries than you'll probably ever need, from image size and JPEG compression levels to an intricate template language that lets you make your pages look however you want them to. Learning to use BetterHTMLExport to build templates can be a little frustrating, but you can't argue with the program's results or its price.—JASON SNELL

GraphicConverter 4.3 9X

♦♦♦♦; Lemke Software, lemkesoft@aol.com, www.lemkesoft.com/us_index.html; $30

GraphicConverter is an excellent tool for people who work with different image formats and want high-powered automation features that speed up work on multiple images. GraphicConverter can read more than 145 file types—from those created by old Mac and PC programs to newer ones used by cell phones and PDAs—and it can export files in more than 45 formats. It also has a suite of painting and editing tools, an image browser, and a batch mode (with AppleScript support) that makes quick work of adjusting or translating a folder of images. Its interface can be a bit dense in places, but for its price, GraphicConverter is hard to beat.—RICK LEPAGE

ImageRodeo 1.2 X

♦♦♦♦; Clyde McQueen, info@imagerodeo.com, www.imagerodeo.com; $30

ImageRodeo is a cool application for automatically generating Web sites from image collections. ImageRodeo comes with five well-designed templates for creating hierarchical sites to show off your pictures, and the app's drag-and-drop interface makes it easy to create a site with 10 or 100 pictures in just a few minutes. Some of the templates even include a link to Shutterfly's online print service, so the relatives can purchase those snapshots without your having to do anything. And when you get tired of the stock templates, you can use ImageRodeo's scripting language and XML commands to create your own.—RICK LEPAGE

iPhoto Librarian 1.0 X

♦♦♦½; Scott Schroeder, scrufmeister@hotmail.com; http://homepage.mac.com/scrufmeister/; free

iPhoto Librarian is an AppleScript application that lets you work with multiple iPhoto libraries. This can be extremely helpful if you want to keep your pictures in separate groups—or on separate hard drives. It's also a boon if you have too many photos for iPhoto to manage without running into performance issues, but you still want to have access to all of your images.—RICK LEPAGE

iPhoto Toast Export Plugin 1.0 X

♦♦♦½; El Gato Software, toastexport@elgato.com, www.elgato.com/toastexport/; free

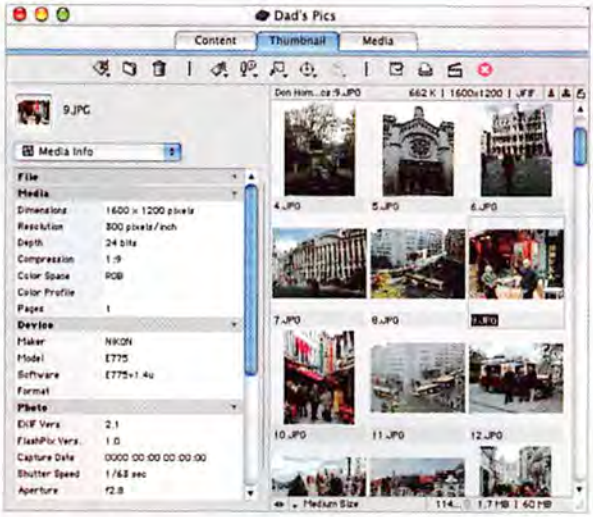
If you want to get your pictures from iPhoto onto a CD, you can *sort of* do it with Apple's Disc Burner utility and a bit of work. But if you own Roxio's Toast Titanium, you should download iPhoto Toast Export Plugin. Burning photos onto a CD is all this plug-in does, and it does it well.—RICK LEPAGE

iView MediaPro 1.5 9X

♦♦♦♦½; iView Multimedia, info@iview-multimedia.com, www.iview-multimedia.com; CD with manual, $90; download, $50

There are many good, low-cost image-cataloging utilities out there, but iView MediaPro is perhaps the best. It quickly catalogs just about every type of graphics file imaginable and displays files cleanly in one of three customizable display modes—text list, thumbnail view, or full-size image. It fully supports AppleScript and drag and drop, can display the EXIF (Exchangeable

Prettier Picture Caffeine Software has packed a lot of features into the free PixelNhance, including tools for adjusting saturation, brightness, color, and sharpness. This image editor is an excellent complement to Apple's iPhoto.



Hold Everything iView MediaPro can catalog all your graphics files and displays detailed EXIF data for your photos.

Image File Format) data recorded by your digital camera, and has lots of shortcuts for navigating your catalogs. It also has a full-featured slideshow mode, can build simple Web pages of your images, and provides an archiving feature for moving images to CD. iView might not be free, but it's better than iPhoto in just about every way.—RICK LEPAGE

PhotoFix 3.4 9X

●●●●; Microspot, 800/622-7568, www.microspot.com; CD, $59; download, $53

If your image-editing desires are in line with Photoshop, but your budget won't even allow you the $100 Photoshop Elements—or if you want an inexpensive OS X–native photo editor—turn to PhotoFix. It looks and feels like a miniature version of Adobe's app, offering tools for painting, cloning, masking, and more. It's nowhere near as fast or complete as Photoshop, but it will do the trick for many image-manipulation needs—it also makes a nice complement to PixelNhance and iPhoto.—RICK LEPAGE

Pic2Icon 1.3 9X

●●●●; Sugar Cube Software, mike@sugarcubesoftware.com, www.sugarcubesoftware.com; free

Pic2Icon does one little thing: it makes 128-by-128-pixel icons for image files so you can browse a folder of images in OS X and see photo-realistic representations of your pictures (something even iPhoto doesn't do). Pic2Icon can read a wide array of file types, including TIFF, JPEG, PDF, PICT, PNG, and Photoshop images, and it can quickly process folders of images. It can even automatically add a drop shadow or dog-ear corner to an icon.—RICK LEPAGE

PixelNhance 1.5 X

●●●●; Caffeine Software, 408/249-1290, www.caffeinesoft.com; free

iPhoto is great for managing your pictures, but there are times when you want to do a little more than fix red-eye or crop a photo. If you're not sure how much image editing you really want to do—or you don't want to plunk down the funds for Adobe Photoshop or Photoshop Elements—check out PixelNhance, a great utility for basic image enhancement. PixelNhance has a straightforward interface with a live preview of the photo you're working on. It can perform brightness, contrast, levels, and saturation adjustments; sharpening; and noise reduction. It also offers extensive controls for adjusting color in an image. It's the perfect complement to iPhoto for the occasional editor.—RICK LEPAGE

ROB GRIFFITHS runs the Mac OS X Hints Web site (www.macosxhints.com), Contributing Editor TED LANDAU runs the MacFixIt Web site (www.macfixit.com) and wrote *Mac OS X Disaster Relief* (Peachpit Press, 2002), Editor in Chief RICK LEPAGE specializes in imaging, and ANTON LINECKER is a video technical advisor and writer. Contributing Editor ADAM C. ENGST, Associate Editor JONATHAN SEFF, and Editor JASON SNELL also contributed to this article.

Photo-Printing Applications

A program such as iPhoto is fine for creating the occasional 4-by-6-inch print, but if you want to maximize the use of costly photo paper—or if you want to print lots of images or multiple copies of one image—look for a photo-printing application.

All of the utilities mentioned here make quick work of printing large groups of photos. You can print images at multiple sizes, from wallet-size pictures to full-page prints. Printing is as simple as dragging a folder of images (or a selection from iPhoto) into the program's window and choosing the appropriate layout.

It's hard to pick one that's better than the others in this group; they all do a good job and are extremely easy to use. Choosing the right one for you depends as much on how you work as it does on the feature set.—RICK LEPAGE

Photo Pal With ImageBuddy, you can easily mix and match images of different sizes, and the app offers options for each page, such as drop shadows, captions, and offsetting for three-hole punches.

PhotoPress 1.0 9X

●●●●; ElectricFish, photopress@electricfish.com, www.electricfish.com; $25

PhotoPress is the most straightforward program of the bunch. It can print as many as 36 photos per page, and it has three built-in photo sets. It has tools for cropping and renaming images and building Finder thumbnails.

ImageBuddy 2.1 9X

●●●●; KepMad Systems, imagebuddy@kepmad.com, www.kepmad.com; $15

ImageBuddy has a clean interface and a deep feature set. Building pages with this program is more interactive than with either of the others, and it has options for adding captions, backgrounds, drop shadows, masks, overlays, and more to your pages.

Portraits & Prints 1.1 X

●●●●; Econ Technologies, info@econtechnologies.com, www.econtechnologies.com; $20

Portraits & Prints has 12 built-in layouts and tools for cropping, sharpening, removing red-eye, and adjusting saturation and brightness. If you want to build layouts, Econ's Template Maker is a great $10 companion to Portraits & Prints.

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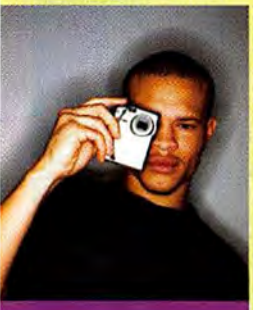

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BY HENRY BORTMAN

Room to Grow

Running Out of Disk Space? Here's How to Pick Your Next Hard Drive.

Pros creating digital videos, mixing audio tracks, and manipulating multimegapixel images have always needed more file storage than one internal hard drive can provide. But with today's Macs serving as powerful digital hubs, and with applications such as iMovie, iTunes, iDVD, and iPhoto churning out file after file, Mac users at all levels are feeling the storage pinch.

There are many ways to add storage to your Mac—in fact, the array can be bewildering. We'll help you choose between ATI, SCSI, FireWire, and other drive types. We'll explain what RAID is, who can benefit from it, and what problems it might cause. And we'll present you with the results of Macworld Lab's tests of one 100GB and eight 120GB FireWire drives. It may surprise you to learn that not all FireWire drives, even those that appear to be similar at first glance, are created equal.

Meeting Your Needs

Before deciding on a storage option, you have to know what you plan to do. Do you work with audio, video, or bitmap images? How big are your files?

Answering these questions will help you determine your required data *throughput rate*—how many megabytes of data you need to move per second—and in turn which storage technology will best serve your needs.

Removing the Bottleneck Regardless of the type of data you work with, your hard drive can create a bottleneck. When you work with images, you want the fastest drive possible. Even if you gain only 10 or 20 seconds every time you open or save a 500MB file, those seconds add up to hours over time. With audio, your hard-drive speed requirement depends on the number of tracks you're working with. A two-track stream of CD-quality audio requires that your hard drive read or write only 0.2 MBps. A 64-track mix bumps the required throughput up to 5.5 MBps. And working with 64 files at once requires a hard drive with quick access time, because the drive head has to jump continuously from file to file.

With video, your drive must be fast enough to deliver data at the required throughput rate. Video is a pass-fail operation: If throughput isn't high enough, you'll drop frames, and the resulting image will appear jumpy. But once you pass the required speed threshold, having a faster drive won't improve anything.

The required rate for digital video is 3.6 MBps. Most drives can deliver the throughput needed for even two-track DV editing. Video professionals, however, use uncompressed video, which requires a throughput rate of 30 MBps. As our tests showed, this is a more

ILLUSTRATION BY ANDREW FAULKNER

FIREWIRE HARD DRIVES

LARGE-CAPACITY, LOWER-COST DRIVES GIVE YOUR FILES BREATHING ROOM

Hard drives are like washing machines; you shouldn't fill them all the way to the top. After a drive is 70 percent full, it becomes fragmented and is likelier to develop directory problems. If you're working with large image files or digital video and have to delete before you can save new files, you need more storage. We looked at nine of the latest, largest, and fastest FireWire hard drives. All but one of the drives offers 120GB of space; the MicroNet drive has a 100GB capacity. At 7,200 rpm, they are all fast enough to capture hours of digital video or speed the way when you're saving Photoshop files. Although all the drives have similar specifications, we found that the QPS and Acomdata drives, which used the faster IBM mechanism, performed the best.

Of all the ways to expand your desktop storage, by far the easiest is to add a single FireWire hard drive. All of these drives come preformatted and include a FireWire cable to connect the drive to the CPU. Once you plug the drive into a power source and start the computer, the drive shows up on the desktop.

Nuts and Bolts

Most of the drives we tested use the latest Western Digital Caviar mechanism. We found that although these drives were fast enough for digital video and most desktop operations, the two drives with the IBM Deskstar (the Acomdata and QPS drives) were 25 percent faster on the Photoshop Suite tasks. Both were also roughly as fast as the reference drive, an internal Seagate Barracuda. Acomdata is selling drives with either mechanism, so find out which one a drive has before you make a purchase. Similarly, QPS is using the IBM drive now but may change mechanisms at a later date.

The bridge chip that converts the data signal from the ATA drive within the case to the FireWire port on the back of the case also affects performance. Storage watchers have made much of the Oxford 911 FireWire Bridge Chip (see "Firing Up FireWire," www.macworld.com/2001/09/buzz/product.html). All of the drives incorporate the Oxford 911 chip except the QPS Que M3, which uses the Initio chip. The QPS drive's performance was nearly identical to the Acomdata drive's in all tests except the Norton Speed Disk test, in which the QPS was 13 percent faster.

The MicroNet drive uses the 100GB version of the Western Digital mechanism. Its performance was similar to that of the 120GB drives.

Software

WiebeTech aims for maximum cross-platform compatibility with its DesktopGB drive. In addition to offering a USB 2.0 port, the drive comes preformatted for DOS. The documentation states that if you plan to use the drive only on a Mac, you'll get better performance by reformatting the drive as an HFS+ volume. The package includes B'sCrew, from BHA, although the drive's documentation does not tell you that the software is hidden on the included CD, in a folder called Drivers. We had no problem using B'sCrew to format the drive as HFS+, but when we used it again to reformat for DOS, the drive reported only 48GB of capacity. WiebeTech confirms the problem and is looking for an alternative to B'sCrew.

ClubMac and QPS include Charismac's Anubis 3.5, a capable formatter that runs only in OS 9. Other World Computing includes the Anubis FireWire drivers but not the full version of the software. This means the drive will mount, but you can't reformat it. The rest of the drives come with Intech Software's straightforward, Mac OS 9–only Hard Disk SpeedTools 3.4 (www.macworld.com/2000/09/reviews/disk_drives.html). In our OS X testing, we were able to initialize all of the drives using OS X's Disk Utility.

FireWire drives are a convenient backup option. They don't offer the security of removable media you can take off-site, but they're fast, and they offer a large capacity.

9 FireWire Hard Drives Compared

* = Editors' Choice.

COMPANY	PRODUCT	MOUSE RATING	PRICE	OS COMPATIBILITY	CONTACT	FORMATTED CAPACITY	PROS	CONS
Acomdata *	120GB External FireWire Hard Drive	●●●●	$350	Mac OS 9, Mac OS X	800/470-4495, www.acomdata.com	115GB	Fast performance; flat-topped case.	No mention of Mac OS X in documentation.
ClubMac	120GB FireWire Hard Drive 7200 Clear	●●●●	$299	Mac OS 9, Mac OS X	800/258-2622, www.clubmac.com	112GB	Solid, flat-topped case; least expensive.	No mention of Mac OS X in documentation.
EZQuest	Cobra+ 120GB FireWire Hard Drive	●●●½	$359	Mac OS 9, Mac OS X	714/694-0031, www.ezq.com	112GB	Instructions on low-level format.	No technical-support information in documentation.
Fantom	FireWire Hard Drive 120GB	●●●½	$359	Mac OS 9, Mac OS X	800/321-4427, www.fantomdrives.com	112GB	Solid, flat-topped case.	No mention of Mac OS X in documentation; case has audio ports.
MicroNet	Advantage 100GB FireWire Hard Drive	●●●½	$309	Mac OS 9, Mac OS X	800/800-3475, www.micronet.com	93GB	Small case.	No mention of Mac OS X in documentation.
Other World Computing	120GB OWC Mercury Elite FireWire Hard Drive	●●●½	$340	Mac OS 9, Mac OS X	800/275-4576, www.macsales.com	112GB	Small case.	No documentation; no formatting software.
QPS *	Que M3 120GB FireWire Drive	●●●●	$349	Mac OS 9, Mac OS X	800/559-4777, www.qps-inc.com	115GB	Fast performance; includes Retrospect.	None major.
Western Digital	WD FireWire 120GB	●●●½	$349	Mac OS 9, Mac OS X	800/228-6488, www.westerndigital.com	112GB	Small case; Mac OS X instructions.	No power switch on case.
WiebeTech	DesktopGB	●●●½	$370	Mac OS 9, Mac OS X	316/744-8722, www.wiebetech.com	112GB	USB 2.0 port; Mac OS X instructions.	Software bugs.

A Winning Combination of Speed and Capacity

Macworld LAB TEST

	OS X Finder	Adobe Photoshop 6.0.1	Adobe Photoshop 6.0.1	Norton Speed Disk 6.0 in OS 9
	FILE DUPLICATE	SUITE	SAVE	OPTIMIZE
Acomdata 120GB External FireWire Hard Drive	0:27	**1:35**	1:10	1:26
ClubMac 120GB FireWire Hard Drive 7200 Clear	0:27	2:00	2:49	1:27
EZQuest Cobra+ 120GB FireWire Hard Drive	0:27	2:00	2:49	1:25
Fantom FireWire Hard Drive 120GB	0:28	2:01	2:48	1:31
MicroNet Advantage 100GB FireWire Hard Drive	0:27	2:00	2:48	1:20
Other World Computing 120GB OWC Mercury Elite	0:28	2:01	2:48	1:26
QPS Que M3 120GB FireWire Drive	0:26	**1:35**	**1:09**	1:16
Western Digital WD FireWire 120GB	0:27	1:59	2:48	1:20
WiebeTech DesktopGB	0:27	2:00	2:48	1:23
internal ATA drive (Seagate Barracuda)	*0:24*	*1:45*	*1:16*	*1:07*
	< Better	< Better	< Better	< Better

BEST RESULTS IN **BOLD**. REFERENCE SYSTEM IN *ITALICS*.

All scores are in minutes:seconds. Our test system was a dual-1GHz Power Mac G4 with OS X 10.1.3 installed and 512MB of RAM. We formatted drives with OS X's Disk Utility. We duplicated a 400MB file in our Finder test. The Photoshop Suite test is a script of five tasks performed on a 50MB file in OS X's Classic mode. We set Photoshop's memory partition to 32MB and History to Minimum. We used a 400MB file in our Photoshop Save test. We booted into OS 9 and formatted the drives using the included utility; we then used Norton Speed Disk to optimize 700MB of data on the test drive.—MACWORLD LAB TESTING BY KRISTINA DE NIKE

QPS includes Dantz's automated backup program, Retrospect Express Backup (www.dantz.com).

Not Just a Pretty Case

The drives from Other World Computing, MicroNet, WiebeTech, QPS, and Western Digital are small enough to slip into a book bag. They range from the smallest, the QPS drive, at 8.5 by 5.5 by 1.5 inches, to the only slightly larger 8.5-by-6.0-by-2.0-inch case from Western Digital. However, a full-size, 3.5-inch, 7,200-rpm device needs more power than the FireWire bus can provide. The drives are portable only if you are willing to carry an AC power adapter and cables as well. These smaller drives do take up less room on the desktop, though.

The WiebeTech drive offers a USB port that supports USB 1.0 and USB 2.0, which has a maximum throughput of 480 Mbps, faster even than FireWire's 400 Mbps. Since Apple hasn't announced any plans to add USB 2.0 to its computers, the only way to use USB 2.0 on a Mac is with a PCI card such as Orange Micro's OrangeUSB 2.0 card. The WiebeTech drive is a good option for transferring data between a Mac and a PC equipped with USB 2.0.

The Acomdata 120GB External FireWire Hard Drive (left) and the QPS Que M3 120GB FireWire Drive

Though they are boxier than the other drives in the roundup, the Acomdata, ClubMac, and Fantom have flat-topped cases—convenient if you need to stack additional drives. The Fantom and ClubMac cases have a completely unnecessary set of speaker ports on the back (because these companies use the same case for their CD-ROM drives). The Western Digital drive is the only one that did not have a power switch on the case. Instead, this drive powers up as soon as you plug it in and powers down as soon as you unplug it—which can be inconvenient when you shut your system down for the night.

Documentation

Although FireWire drives are remarkably easy to set up, you might need a few simple instructions. Only the Other World Computing device arrived with no manual or tech-support information. The rest of the drives have at least a few pages of documentation, but EZQuest did not include a tech-support phone number or e-mail address in its setup manual. Unfortunately, Western Digital and WiebeTech are the only vendors to include any instructions on how to use their drives with OS X. As OS X is now the default operating system for the Mac, the absence of such instructions becomes more glaring every month.

Although the documentation for each device generally describes how to connect the drive to your computer, in no case does it mention the limits of the FireWire bus. You can attach 63 devices to a FireWire port, but a maximum of 16 can be in a row. As FireWire devices continue to proliferate, users will need more instructions on how to cable them together.

All of the vendors support booting in OS X except Fantom and MicroNet. We were able to use these drives as boot drives, but if you have trouble, the vendor may not give you technical support. Note that blue-and-white Power Mac G3s, some early G4s, and PowerBooks may not boot from a FireWire drive or may need a firmware update first.

Macworld's Buying Advice

If you're working with large files or digital video, you always need more storage. Any one of these drives should give you enough free space for at least a few months, and all of them were easy to set up and use. Overall, we recommend the drives from QPS and Acomdata for their superior performance. The USB 2.0 port on the drive from WiebeTech will come in especially handy if you plan to use the drive on more than one platform (although we hope that the company fixes the software issues). And the ClubMac drive is a solid, low-cost option.—KRISTINA DE NIKE

>>

Byte Count

DATA USE	APPROXIMATE DATA THROUGHPUT RATE (MBps)	RECOMMENDED DRIVE
iTunes (MP3) audio import	0.02	FireWire drive
Uncompressed (CD-quality) stereo audio	0.2	FireWire drive
64-channel (CD-quality) audio mixing	5.5	FireWire drive may work; consider ATA-hardware or SCSI-software RAID
iMovie (DV) video import	3.6	External FireWire drive; don't bother with RAID
Dual-stream DV editing	7.2	FireWire drive should work; consider ATA-hardware or SCSI-software RAID
Uncompressed video import	30.0	External SCSI drive
Dual-stream uncompressed video editing	60.0	SCSI-software RAID; Fibre Channel RAID for collaborative work
Hobbyist iPhoto image editing	not applicable	FireWire drive
Professional Photoshop image editing	not applicable	ATA-hardware or SCSI-software RAID

daunting goal to achieve. For an at-a-glance breakdown of throughput recommendations, see "Byte Count."

Cash and Carry Speed isn't everything, of course. Other factors will affect your purchasing decision. One of these, obviously, is price, which varies widely between drives.

You should also consider portability. Some drives, for example, install only internally and are therefore a hassle to move from computer to computer. Others connect externally, so you can move them around more easily.

Now that we've covered the basics, let's take a look at the available storage technologies in more depth. By exploring the trade-offs between speed and price, we can help you figure out which drive suits the way you work. And if it turns out that FireWire is your best bet, our review of nine different FireWire drives will help you select the ideal model.

Understanding Storage Technologies

Today's Macs let you connect hard drives via USB, ATA, FireWire, SCSI, and Fibre Channel. You can also combine two or more drives in an array, a technology referred to as RAID (Redundant Array of Independent Disks).

ATA You already own an ATA (Advanced Technology Attachment) drive—there's one inside your Mac right now. ATA has long been the standard drive interface on PCs, and in recent years it's become standard on Macs as well. ATA drives are relatively inexpensive—around $125 for a common 80GB model.

Today's Macs implement the ATA/66 standard, which delivers data at speeds as fast as 66 MBps. ATA drives are speedy enough for most home uses and even for many professional uses, aside from handling uncompressed video or heavy Adobe Photoshop work.

An ATA drive's big drawback is that you must install it internally. You can add them only to desktop Power Macs, not to iMacs, PowerBooks, or iBooks, and you can't move them from one computer to another without seriously nerdish hassles.

Power Macs can support up to four ATA devices (including the built-in optical drive), and you can add more if you install a PCI ATA card.

USB Today's Macs have two built-in interfaces for connecting external devices: USB and FireWire. USB is often the cheaper option. LaCie (503/844-4500, www.lacie.com), for example, sells an 80GB USB drive for around $250, but its 80GB FireWire drive costs $300. However, the version of USB (1.1) in current Macs has a maximum throughput rate of 1.5 MBps. That's good enough for iTunes and lightweight iPhoto work, but inadequate for multitrack audio mixing, digital video, and serious bitmap-image manipulation in Photoshop.

This picture will soon change somewhat because both USB and FireWire are due for upgrades that will make them faster and narrow the gap between them (see "Tomorrow's Storage," elsewhere in this feature, and "FutureWire," *Mac Beat*, February 2002).

FireWire FireWire is Apple's trademarked name for the IEEE 1394 interface standard. Most current camcorder models sport a 1394 connection.

The FireWire interface supports sustained transfers at speeds as high as 30 MBps—in theory. In practice, today's FireWire drives are slowed by the fact that they're really ATA drives with an ATA-to-FireWire bridge chip added to make them behave according to the FireWire protocol.

As we discovered in Macworld Lab's tests of eight 120GB FireWire drives and one 100GB drive, not all bridge chips work equally well (see "FireWire Hard Drives"). While all of our FireWire drives captured digital video flawlessly, none was able to capture uncompressed video without dropping frames.

You can connect external FireWire drives to any Mac, including iMacs and Mac portables, and you can easily move them from one computer to another. You don't even have to turn off your Mac to connect or disconnect the drive. The latest rage in FireWire drives is miniature devices not much bigger than an iPod. You'll pay a steep premium for such drives, though. For example, a portable 20GB Que M2 QuadSlim FireWire drive ($249; 800/559-4777, www.qps-inc.com) costs more than the larger, 60GB Que M3 Ultraslim model ($229). Moreover, the portable models are available only with relatively small capacities.

If you want an external drive and your requirements aren't too demanding—that is, if you're not a media professional—a FireWire drive should suffice.

SCSI Apple has relegated its former drive-interface standard, SCSI, to optional status in recent years. Macs no longer include built-in SCSI interfaces; you have to add a SCSI controller card to connect SCSI hard drives.

But SCSI remains the interface of choice for media professionals. The reason is simple: SCSI drives are fast. Drive vendors bring out their new high-performance drive technologies on SCSI first. At press time, the top-of-the-line SCSI bus standard was Ultra160,

The RAID Report

RAID is good for two things: improving speed and providing data security. RAID achieves this security by storing redundant data. Oddly, the variant of RAID that delivers the greatest speed, RAID 0, doesn't actually provide any redundancy—in this case, the term *RAID* is a misnomer. And that's why it's the fastest: data redundancy requires processing overhead, which reduces data throughput.

To better understand how RAID's two or more drives function, imagine a bathtub that comes in two models. One has a single faucet capable of putting out 5 gallons per minute (gpm); the other has two 3-gpm faucets. The 5-gpm faucet can fill the tub faster than a single 3-gpm faucet, but the two-faucet model will win the tub-filling race if you use both 3-gpm faucets simultaneously.

RAID Levels

There are more than a dozen RAID configurations, or levels, each designated by a number. RAID 0, the speed king, implements a technique known as striping. Striping increases data throughput by distributing disk reads and writes between two or more hard drives. Striping is useful for operations that involve high data throughput, such as capturing and editing uncompressed audio and video streams and manipulating large, multilayered bitmap-image files.

RAID 0 implements only striping. Most RAID levels, however, combine striping with one of two types of redundancy: mirroring or parity. Mirroring makes two copies of all data and stores each copy on a separate hard drive. This enables instantaneous recovery if one drive fails.

Parity is a lower-cost alternative to mirroring. Parity schemes calculate and store special bytes of parity data that can restore a user's original data in the event of a drive failure. The redundant data takes up less space than mirrored data (hence the cost savings), but recovery takes longer with parity.

Who Needs RAID?

RAID isn't for everyone. Unless you're an audio or video professional, or you do some pretty serious Photoshop work, you don't need it to get your work done. The ATA drive in your Mac or a FireWire drive—or a SCSI drive, if you want to ratchet things up a bit—will suffice. As our lab tests showed, you need only a single SCSI Ultra160 drive even to capture uncompressed video.

RAID is for work that requires the ultimate in drive speed. If you want to mix multiple uncompressed video streams in real time, for example, RAID is practically a necessity. Likewise, if you're doing 64-track audio work, you may benefit from spreading the load over several drives in an array. And if you work with monster-size Photoshop files and can shave off 10 or 20 seconds every time you open or save a file or create a new layer, your investment in RAID technology could quickly pay for itself.

But RAID doesn't come cheap, because it requires at least two drives, and one big drive always costs less than two smaller ones. For example, the total cost of two 36GB LaCie Ultra 160 drives costs nearly $200 more than a single 73GB drive of similar quality. If you need the speed advantage RAID offers, this expense is warranted; otherwise, you should save your money.

RAID Options

If you decide you do need a RAID array, some choices lie ahead. The first is whether to use a hardware or software RAID. The former requires specialized hardware that you install as an add-on card in your Power Mac or that comes built in as part of an external enclosure containing the array's drives. This hardware performs the calculations necessary to distribute your data among the drives in your array, taking a burden off your Mac's main processor.

The ATA hardware RAID we tested—an Acard ATA-133 RAID PCI card connected to two internal 80GB ATA drives, at a total price of around $600—did very well in all of our tests, capturing uncompressed video without dropping frames (see *Reviews*, June 2002, for details). We did not test SCSI and Fibre Channel hardware RAIDs.

A software RAID is less expensive. In fact, if you use the RAID software built into OS X's Disk Utility, it won't cost you anything. (Well, you'll still have to buy the drives.) Disk Utility lets you create a RAID 0 or RAID 1 array using either ATA or SCSI drives. FireWire is not supported.

Atto's ExpressStripe (716/691-1999, www.attotech.com) is the only available OS X–savvy alternative to Disk Utility. With this $30 program, you can create RAID 0 arrays using just about any combination of drives you like, including FireWire and Fibre Channel.

We saw mixed results in our software RAID tests. Our FireWire software RAID outperformed a single FireWire drive, sometimes significantly, but was still bested by the single ATA drive that came with the Mac. Strangely, our ATA software RAID also finished tasks more slowly than a single ATA drive, a result of the ATA protocol's limitations. But our SCSI software RAID zipped through every task at record speed and had no trouble capturing uncompressed video.

Back It Up

If you set up a RAID 0 array, backing it up is even more important than usual. Unlike other RAID levels, RAID 0 does not provide any data redundancy. Moreover, RAID 0 takes bits and pieces of your files and scatters them across multiple drives. If any one of these drives fails, you could lose all of your data.

The Bottom Line

If you decide that RAID is for you, stay away from FireWire. If you're on a tight budget and you don't mind a little bit—and possibly a *lot*—of setup hassle, an ATA hardware RAID will provide a significant speed boost for a relatively modest investment. And if you work in a collaborative professional environment, you may want to consider Fibre Channel. But for the ultimate in speed, there's no beating SCSI. You'll have to shell out some extra cash, but you'll be the first one to cross the finish line.

Does RAID Rock?

Macworld LAB TEST

	OS X Finder FILE DUPLICATE	Adobe Photoshop 6.0.1 SUITE	Adobe Photoshop 6.0.1 SAVE	Norton Speed Disk 6.0 in OS 9 OPTIMIZE
ATA/100 drive	0:24	1:45	1:16	1:07
ATA/100 software RAID	0:31	1:46	1:51	1:15
ATA/100 hardware RAID	0:19	1:33	1:17	0:51
FireWire drive	0:36	2:06	2:53	1:41
FireWire software RAID	0:34	1:40	1:38	N/A*
SCSI Ultra160 drive	0:17	1:23	0:56	0:58
SCSI Ultra160 software RAID	**0:12**	**1:14**	**0:34**	**0:39**
	< Better	< Better	< Better	< Better

BEST RESULTS IN **BOLD**. * N/A = NOT APPLICABLE.

All scores are in minutes:seconds. We tested on a dual-1GHz Power Mac G4 with OS X 10.1.2 installed and 512MB of RAM. The FireWire drives were 120GB, the ATA drives were 80GB, and the SCSI drives were 73GB. The FireWire and ATA drives were 7,200 rpm; the SCSI drive was 10,000 rpm. We striped the FireWire array with Atto ExpressStripe 1.0. We striped the ATA drives with OS X's Disk Utility. We used the Acard ATA-133 RAID PCI card for the ATA hardware RAID. We striped the SCSI RAID with LaCie's Silverlining in OS 9 and Disk Utility in OS X. We duplicated a 400MB file in our Finder test. The Photoshop Suite test is a script of five tasks performed on a 50MB file in OS X's Classic mode. We set Photoshop's memory partition to 32MB and History to Minimum. We used a 400MB file in our Photoshop Save test. We booted into OS 9 to use Speed Disk to optimize 700MB of data on the test drive.—MACWORLD LAB TESTING BY KRISTINA DE NIKE

Tomorrow's Storage

Storage technology is in constant flux, and USB, FireWire, and SCSI are all poised for the leap to faster implementations.

The upcoming USB 2.0 supports 60-MBps transfers, a huge leap from the current 1.5 MBps. USB 2.0 interface cards and hard drives are already on the market. But there's no USB 2.0 driver—required software—available yet for the Mac, and third parties are waiting for Apple to provide one. Rumor has it that the next major OS X update will include a USB 2.0 driver (for more on the OS X update, see *Mac Beat,* elsewhere in this issue).

FireWire is also undergoing changes. The current implementation of the FireWire standard is IEEE 1394a, rated at 400 *megabits* per second (which translates to a total potential throughput of 40 *megabytes* per second). But only 30 MBps is available for operations, such as video capture, that require a guaranteed sustained rate of throughput.

By the end of the year, we expect 1394b FireWire drives and Macs with 1394b interfaces. The first 1394b devices will be rated at 80 MBps, with 60 MBps available for sustained-throughput tasks. The second generation of 1394b devices—delivery date unknown—will be capable of delivering 160 MBps (120 MBps for sustained transfers). 1394b drives will work with current Macs, but you won't be able to take advantage of their greater speed unless you install a 1394b add-on card. (This, of course, will be an option only on Power Macs.) Expect to pay $500 or more for these cards at their introduction.

While FireWire is racing to catch up with SCSI, the latter isn't standing still. The current SCSI high end is Ultra3 (or Ultra160), which can deliver 160 MBps. As we went to press, however, Atto (716/691-1999, www.attotech.com) and Adaptec (800/442-7274, www.adaptec.com) announced that they will ship Ultra320 SCSI add-on cards soon; Ultra320 drives may be available by the time you read this. Ultra320 (not known as Ultra4—go figure!) will support data-transfer rates up to 320 MBps.

Note that to get maximum speed from an Ultra160 drive, you need to install an Ultra160 card in your Mac as well, and this alone can cost you $350. You'll also need an Ultra320 card to take full advantage of Ultra320 drives when they become available.

Drives keep getting faster, but taking advantage of newer, speedier drives requires that you upgrade your Mac as well. So before you make your drive purchase, you have to think about what you're likely to need next year, as well as what you need today. Make sure that what you purchase now will work for you down the road—or that you can afford to replace it when it becomes obsolete.

which can transfer data at a sustained rate of 160 MBps. By the time you read this, even faster drives should be available.

Our tests confirmed SCSI's superior performance. The SCSI Ultra160 drive bested the Mac's built-in ATA drive by more than 20 seconds in one of our Photoshop tests and more than 40 seconds in another. The SCSI drive also captured uncompressed video without dropping frames.

But you pay for this kind of performance. LaCie, for example, sells a 160GB FireWire drive for $469 but charges $1,699 for a 180GB Ultra160 SCSI drive. When budgeting for a top-of-the-line SCSI setup, include as much as $400 for an add-on SCSI interface card.

High-End Options

For some, even a single high-end SCSI drive is inadequate. Two alternatives that will better suit some professionals in print shops and video houses are Fibre Channel and RAID.

Fibre Channel Fibre Channel is a cross between a network and a peripheral interface. It not only provides a means of attaching drives to computers but also makes it possible for two or more computers to share drives.

Fibre Channel is capable of sustained throughput at speeds of 200 MBps. *Dual porting*, an option that supports data transfers in two directions at once, can double Fibre Channel's throughput rate to 400 MBps.

With Fibre Channel, you can separate devices by as much as 10 kilometers without affecting performance, so it's an excellent choice for a spread-out workgroup, such as some prepress shops and video-editing studios.

Fibre Channel is even more expensive than SCSI. To tap into its big advantage—data sharing—each Mac on the storage network needs a Fibre Channel add-on card. These cost around $1,000 apiece. You'll pay more for the drives, too. Medéa (888/296-3332, www.medea.com) sells a SCSI drive array with a total capacity of 160GB for $3,899. Its 160GB Fibre Channel array costs $4,699.

RAID So far, we've talked mainly about the speeds you can get from single hard drives. By distributing drive operations among multiple drives, you can achieve speeds that far exceed those of a single drive. In Macworld Lab tests, we found that RAID boosted both Finder and Photoshop operations, although results depended heavily on the drive type (see "Does RAID Rock?"). RAID is also valuable for high-end, multiple-stream video work, but it has definite limitations. (For more details on RAID, see "The RAID Report.")

The Last Word

You have a lot to think about before you're ready to buy another hard drive, but at a basic level, the choices are simple.

If you're a casual user, whether it be in audio, video, or digital photography, your best bet is probably a FireWire drive. They're plenty fast, not too expensive, easy to install, and portable.

If you're a professional or a serious hobbyist, we recommend SCSI. You'll pay a premium, but you can't beat it for speed.

RAID is also a good option for pro users, and it's a virtual necessity for professional video editing. If you're on a tight budget, an ATA-hardware RAID may serve you well—just be aware that this solution limits your expansion possibilities. If data sharing is important, check out Fibre Channel. Again, for top performance, SCSI is the way to go. □

Contributing Editor HENRY BORTMAN is a San Francisco–based science and technology writer who would appreciate it if someone would design additional storage for his brain.

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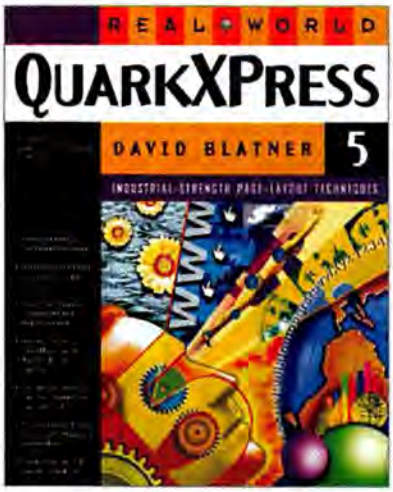
Save XPress Styles

You've lovingly styled a slew of text in QuarkXPress. Then you're forced to export it—perhaps so an editor can work on the words while you refine the layout. But to your horror, you find that much of the formatting disappears, meaning that you have to style it again when you import the edited text. Happily, there's a way to preserve your hard work: XPress Tags.



Book Smart This article is an excerpt from *Real World QuarkXPress 5* (Peachpit Press, 2002), by David Blatner. You can find the book at www.peachpit.com or your local bookseller.

What Are XPress Tags?

The XPress Tags format uses its own special—and complicated—coding that records every one of QuarkXPress's text-formatting attributes, from style sheets to local formatting (see "Mumbo Jumbo"). If you're familiar with the old code-based typesetters, you'll love XPress Tags.

When you use XPress Tags, you generate text-only ASCII files. You may find a text-only file with XPress Tags confusing to look at, with its multitude of arcane numbers and codes. However, there are many reasons why XPress Tags is the best format to use when you need to export, edit, and then reimport copy.

Why Use XPress Tags?

XPress Tags files retain a document's QuarkXPress formatting, and because ASCII is a universal file format, almost any operating system can read and edit these files. Although the coding may appear daunting if you're used to the WYSIWYG world of Windows or the Mac, professional typesetters have been working with code-based systems for years, and tagged files can easily be integrated into such an environment.

The following tips will help you make the most of XPress Tags. (For basics on exporting and importing, see "Take Command of Your Text with XPress Tags," www.macworld.com/1999/08/create/printing.html.)

Tags Are Case-Sensitive

All XPress Tags are case-sensitive, so typing **<H>** rather than **<h>** can mean the difference between small caps, horizontal scaling, and failure. Style, color, and H&J names are the same way. If you forget the tags, they're easy enough to find and replace in Word or a case-sensitive text editor.

Applying Styles in Text Editors

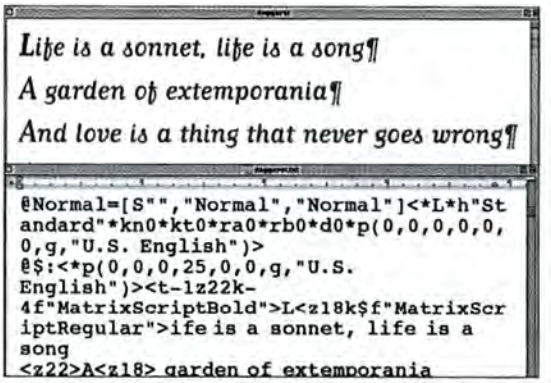
One of the simplest (yet most powerful) uses of XPress Tags is to apply style sheets or formatting to text from within a word processor or text editor that doesn't support style sheets. For instance, if you use a simple text editor that doesn't even let you apply italic formatting, you can type **<I>** before and after a word. When you import the file into XPress, the program interprets these tags and italicizes the word. (The first time you apply the tag, you turn italic on; the second time, you turn italic off.)

You can apply a paragraph style sheet by typing **@stylesheet:** at the beginning of a paragraph (you need the colon at the end). The style sheet will apply to all subsequent paragraphs until you specify a change. Similarly, the code to apply a character style sheet as local formatting is **<@stylesheet>** (to apply the style) and **<@$p>** (to end the character style).

Once you're familiar with the coding format XPress Tags uses, you can easily set up a macro to apply formatting codes to an ASCII file in your word processor. CE Software's QuicKeys (800/523-7638, www.cesoftware.com) can make such a macro for any text editor. If you're handy with database programs, you can design a report format that creates a file incorporating XPress Tags, so you can export data from your database and have it land on your QuarkXPress pages fully formatted and untouched by human hands.

Shorter Tags

Are you tired of typing long tags, such as **@Bodytext =<*J*p(7.2,0,7.2,11,0,3.6,g)*t(148,2,"")*d(1,2)z9>**? Then stop! Instead, substitute a unique brief placeholder for each long tag in your coded document. For instance, type ***bb** instead of the code above. Then later, search for the placeholder and replace it with the real thing. You can use a word processor to make this change, or you can use a shareware utility such as Torquemada, by Greg Swann, or Add/Strip, by Jon Wind, so you'll never have to type anything



Mumbo Jumbo When you save a formatted XPress file in XPress Tags format (top), the resulting text file retains the formatting with complicated codes (bottom).

more than once. You can download both utilities from www.versiontracker.com.

Of course, make sure you use unique sequences of characters for your placeholders (that is, sequences that don't appear anywhere else in your text).

Fake Fractions the XPress Tags Way

Here's an XPress Tags find-and-change procedure that can save you hours when you have to create a large number of well-set fractions. For example, you can search for all instances of **1/2** and replace them with **<z7k-10b-3>1<z12k-8b0>⁄<z8k0>2<z$>**. This set of codes makes the type size 7 points, the kerning 10 units, and the baseline shift 3 points, and then types **1**. It then changes the type size to 12 points, the kerning to –8 units, and the baseline shift to zero before typing a fraction bar (option-shift-1 [one]). Finally, it makes the type size 8 points, sets no kerning, and types **2** before resetting the type size back to its original value.

Expert Fractions with XPress Tags

The previous tip is useful for building "made" fractions—fractions that are created by resizing type and moving it around. What if you want "drawn" fractions—numerators and denominators predesigned just for this use? Expert Set fonts with this sort of character are available for many type families (Minion, Utopia, and Bembo, to name a few). Using XPress Tags, you can automate their substitution, too.

This works for the fractions shown in "Friction-Free Fractions." Export your text in XPress Tags format and open the file in a word processor. Let's say you want to convert all the **1/4** fractions. In the word processor, search for **1/4** and replace it with **<f"MinionExp-Regular">G<f"Minion-Regular">**.

The Expert Sets also contain the numerals zero through nine in the numerator and denominator positions so you can create any other fraction, too. Press shift-option-0 through shift-option-9 to get the raised numerators, and option-0 through option-9 to get the baseline denominators. The correct fraction bar is the slash in the Expert Sets. You can automate this process somewhat with XPress Tags, but you have to create each different fraction individually. For instance, to make the fraction $^{13}/_{16}$ you would search for **13/16** and replace it with **<f"MinionExp-Regular">** followed by option-shift-1, option-shift-3, slash, option-1, option-6, and finally **<f"Minion-Regular">**. One step too complicated? Maybe—but it sure saves time if you've got oodles of fractions in a long document.

Overprinting Accents with Tags

Working in non-English languages can be a complicated proposition, especially when you're working with an American or English computer system. Some characters have to be built by superimposing one character, such as an accent, on another, such as a letter—for example, š. If you have a document that's full of them, you should consider using XPress Tags.

Somewhere in your document, create the overstrike character and style it as you want, using baseline shift, kerning, sizing, and so on. (You often need to positively kern after the accent character.)

Export the sample "character" and the text that contains all the characters you want to overstrike in XPress Tags format. Then open the XPress Tags files in a word processor. The sample you made will look something like **<k-90>s<k11b0.2>ˇ<k0b0>**.

Perform a Find/Change with the overstrike pair and the XPress Tags version.

Getting XPress Tags Out of Word

Thomas Kaltschmidt's QXPort utility (www.dtpro.de) lets you export XPress Tags out of Microsoft Word; this can be incredibly helpful when you're preparing documents for QuarkXPress, especially when the files have a lot of local formatting applied to them or if you have used Word's Styles feature. You can get more information from the German developer's Web site.

Take Care with Tags

Using XPress Tags can be lifesaving—but coding them incorrectly can result in serious troubles. Fortunately, most improper coding won't kill XPress on import; instead, the program will stop at the error and tell you it found something wrong.

To avoid the most-common problems, close all tag definitions with the characters that began them, and always use the newest XPress Tags filter (version 3.0 of XPress Tags ships with version 5.0 of XPress; you can find out an XTension's or filter's version by clicking on About in the XTensions Manager dialog box). □

Contributing Editor DAVID BLATNER is a coauthor of the upcoming *Real World InDesign 2* (Peachpit Press, 2002). You can find him at www.moo.com.

Friction-Free Fractions

In many typefaces' Expert Sets, you can use these keystrokes to insert ready-made fractions.

Fraction	Expert Keystroke
¼	G
½	H
¾	I
⅛	J
⅜	K
⅝	L
⅞	M
⅓	N
⅔	O

Cover Your Assets

A glance inside the typical company's storage room proves that the paperless office is still more fantasy than fact. But given that paper records require a hefty amount of storage space, are susceptible to fire and flood damage, and cannot be searched or repurposed easily, moving your paper assets to electronic form makes a lot of sense. In the following pages, we'll examine the best ways to implement a paperless plan.

Assess Your Needs

There's no denying the allure of an electronic archive that's indexed, searchable, and indestructible. But before you plunge into the job of conversion, consider the following questions: How much material do you need to convert? Into what form do you want that material converted—digital copies, searchable text, editable text, Web pages, or forms, for example? Do you need to convert only old documents, or will conversion be an ongoing process? How much time and money are you willing to invest in a solution?

ILLUSTRATION BY BRIAN CAIRNS

Hire a Pro The first thing the answers to these questions will help you determine is whether doing the work yourself makes sense. If you have a lot of documents that are difficult to handle—for example, thousands of paper documents of different sizes with printing on both sides—you may want to turn your work over to a professional. Ultimately, this may be more cost-effective than purchasing a capable sheetfed scanner and paying someone to operate it for weeks on end.

You can hire someone to take on these tasks—for a price. Document Solutions (510/986-0250, www.document-solutions.com), for example, charges between 10 and 30 cents a page for basic imaging (PDF images only), depending on the volume of material you want scanned and the ease of scanning.

Expect to pay more for optical character recognition (OCR)—a process that turns scanned words into editable text—or to add navigation features (hyperlinks and indexes, for example) to your documents. Adobe maintains a list of partners that provide these kinds of services at http://partners.adobe.com/acropartners/scansb.html.

Do It Yourself If you or your business want to convert a limited number of documents—or if you have more time than money—in-house conversion may be for you.

The Right Tools

To convert text from paper to pixels, you need your Mac, a scanner, and the right software.

Hardware To convert your paper assets into digital documents, look for a sheetfed scanner that can automatically scan multiple pages. Epson (800/873-7766, www.epson.com) and Hewlett-Packard (800/752-0900, www.hp.com) make sheetfed scanners; models with a USB or SCSI interface start at around $400 (see www.macworld.com/subject/scanners/ for our latest scanner reviews). Check scanner manufacturers' Web sites for information regarding OS X compatibility before making a purchase.

Software Scanners do nothing more than take a picture of your paper document. If you want to be able to *use* the documents later, you must turn them into editable text. To do this, you need either an OCR application or—if you plan to work with PDF files exclusively—a copy of Adobe Acrobat 5 ($249; ♦♦♦♦; *Reviews*, October 2001; 800/833-6687, www.adobe.com).

OCR programs interpret the dots that make up characters in an electronic document and convert those dots into recognizable and editable text. Such programs differentiate between text and graphics; mimic the formatting of the original document; offer a spelling-checker component; and export results in a variety of formats, including plain text, RTF, HTML, image, Microsoft Word and Excel, and PDF.

If you just want electronic copies of your documents, either a simple image scan or a scan followed by conversion to PDF will meet your needs. The doc-

uments best suited for OCR are those you intend to edit. For example, if an attorney wanted to use several pages of a long deposition, she could scan the material, convert it into editable text with an OCR program, and copy and paste that text into her brief.

If you're dissatisfied with the software included with your scanner, you may want one of two higher-powered options: ScanSoft's $499 OmniPage Pro X (♦♦♦½; 800/654-1187, www.scansoft.com) or Abbyy's $130 FineReader Pro 5 (♦♦♦; 877/328-2229, www.abbyyusa.com); for more about these programs, see *Reviews*, June 2002. For example, many programs don't have a batch-processing feature, essential if you plan to scan hundreds of documents and don't have time to baby-sit the OCR program.

There are other reasons to trade up: you may want to scan documents in languages other than English, or perhaps your OCR program has trouble recognizing characters in documents that came from a fax machine.

Adobe Acrobat Most OCR software lets you scan to PDF, a great option if you want to create searchable files that maintain their original look and are readable by any computer running Acrobat Reader. If you need to save scads of paper files to PDF, you may find that a full-featured OCR program performs this service more efficiently. However, you'll probably want a copy of Adobe Acrobat if you plan to create more-complex PDF files.

With its forms functionality, Acrobat is the tool to use when moving forms from paper to the Web. And Acrobat makes it easier to find information in your electronic documents, thanks to its ability to add navigation features such as hyperlinks, tables of contents, and indexes. This is particularly useful in PDF documents that include hundreds of pages.

With the full version of Acrobat on a Mac running OS 9.2 and earlier, you may be able to dispense with OCR software. You can scan files directly into Acrobat and convert them to searchable text with Acrobat's online Paper Capture feature. (Regrettably, Acrobat doesn't support import via scanning and Paper Capture in OS X.)

To do so, select the Import command from Acrobat's File menu and then select Scan. After scanning the document, Acrobat converts it into a PDF file. To then convert the image into searchable text, select Paper Capture from the Tools menu.

Paper Capture uploads your PDF file to Adobe's Web site, where software on a secure server runs the file through an OCR process and then sends it back to your Mac as a PDF with searchable text. This free service is not as fast or convenient as the built-in Paper Capture plug-in that provides the same service in Acrobat's Windows version. (This feature doesn't work in the Windows version running in Connectix's Virtual PC). Nor is it as powerful as Adobe's Acrobat Capture—a Windows-only application that includes OCR and automatically creates intradocument links.

SCAN THE LIGHT FANTASTIC

Converting printed pages into digital documents can be a grind. These tips may make the process a little easier.

- Use clean source documents. OCR programs do their best work with pages printed on a laser printer and created with simple typefaces. Scan a crinkled fax or a page that makes use of rococo fonts, and you'll spend a lot of time using your OCR application's spelling checker and retyping material.
- Keep your scanner clean. Smudges and dirt can add artifacts to scans.
- Even if you can control skew with your OCR application, you'll get a more accurate scan (and spend less time tweaking the image) if you line up your pages correctly against the scanner's guides.
- Scan at 300 dpi or better for optimum accuracy.
- Whenever possible, scan pages in black-and-white. OCR programs are more accurate with black-and-white scans than with those done in gray scale or color.
- Edit out unnecessary page elements (such as headers, footers, and logos) in your OCR application before exporting the file. Otherwise, important text may get bumped off the page.
- Proofread the resulting documents—particularly if you won't be running them through another application's spelling checker.

The online Paper Capture feature is most useful for Mac users who have a fast connection to the Web and need to process only a few files.

Asset Management

If you've converted documents you don't need to access routinely—old accounting or tax records, for example—you can simply archive this material the next time you back up your data (see "Save Your Data," September 2001).

For ongoing projects, you'll need a better way to organize and retrieve your documents. This may be as simple as placing all related documents in a folder on your hard drive or office server. If you need to locate and link information within several of a project's PDF documents, a better strategy is to use Acrobat to create hyperlinks within the files and to then set up a master index for all files in that project.

Once you move beyond the couple-of-projects stage, you may want to consider dedicated asset-management software. Applications such as Canto Cumulus 5.5 (415/703-9800, www.canto.com; $4,496 for the Workgroup edition with ten clients, $100 for the Single User edition) and Extensis Portfolio 6 (800/796-9798, www.extensis.com; $2,499 for Portfolio Server with five clients, $200 for the single-user edition) offer extensive keyword and search functions that can help you organize and catalog your assets and make them accessible across a network. Currently, only the Workgroup and Enterprise ($25,000 for five users) editions of Cumulus are OS X native, and no version of Portfolio is OS X native. For more on these applications, see *Reviews* elsewhere in this issue.

Although a paperless office may be an unattainable goal, with these strategies you can turn your pulp into productive (and more easily protected) pixels.

Contributing Editor CHRISTOPHER BREEN is a well-recognized character in *Macworld*'s *Mac 911* column, as well as the author of the book *Mac 911* (Peachpit Press, 2002).

End Font Frustration

Along with the typographic freedom Mac users have always enjoyed, there have often been strange font conflicts, inexplicable font substitutions, and even system crashes related to corrupt fonts. Mac OS X has fixed many of these problems, providing stability and exciting new font formats and capabilities. At first glance, fonts and font management in OS X may appear complicated—but we can help you understand them.

A Font by Any Other Name

OS X now supports PostScript and OpenType fonts, in addition to traditional screen and TrueType fonts, and it has introduced a new format known as *dfont* (data-fork TrueType font). You're probably quite familiar with Adobe's PostScript standard, but here's the scoop on the others.

OpenType was announced in 1997 by Adobe and Microsoft, but until the release of OS X, Mac users needed Adobe Type Manager to use OpenType fonts. OpenType is essentially a wrapper around the TrueType and PostScript formats. An OpenType font is a single file, and it works across platforms (unlike TrueType and PostScript fonts, which must have separate PC and Mac versions).

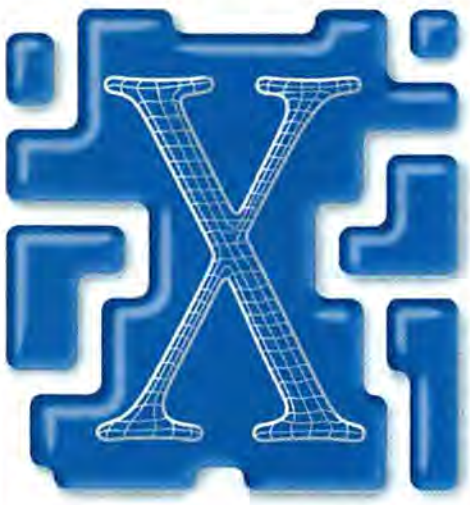


ILLUSTRATION BY CHRISTOPH NIEMANN

OpenType's big advantage over PostScript and TrueType is its support for extended character sets. OpenType, along with OS X, supports Unicode—a method of encoding characters that allows for more than 65,000 different symbols (type designers call them "glyphs") in a font; PostScript and early TrueType allow only 256.

This is important for a couple of reasons. First, 256 letters simply aren't enough for many languages. Second, some designers need extra characters, such as swash characters and ligatures; there simply isn't enough room in a 256-character font for them. Many foundries don't yet sell OpenType fonts (Adobe and Bitstream are exceptions), but expect to see more soon.

The dfont format is nearly identical to TrueType, but it's OS X friendly. All the information in a dfont file is stored in a way that's compatible with current and future Unix file systems, such as the Unified File System (UFS) that can be installed optionally with OS X. Because dfonts are used within the system itself, don't expect to see them from vendors other than Apple.

Font Locations in Mac OS X

In OS X, fonts are stored in six different locations (see "Home Sweet Homes"), and as the system looks for a font, it goes through them in a particular order. So which folder should you store your fonts in? It depends.

For applications running in the Classic environment, the system will search only the Fonts folder in the Classic System Folder. If you run applications in Classic and in OS X, you should place all your fonts in the Classic Fonts folder so they'll be accessible to all applications. But if you run only OS X–native applications, you should put all fonts in your personal Fonts folder (*username*: Library: Fonts). If you're running only OS X applications and you want to have a common set of fonts for all users, a user with administrator rights should install fonts in the Library: Fonts folder. (For more on users in OS X, see "Many Users, One Mac," *Secrets*, May 2002, and "Crowd Control," *Secrets*, June 2002.)

Multiple Master PostScript fonts are a special case—OS X doesn't directly support them. But Adobe applications that use them— such as InDesign, Photoshop, and Illustrator—will still work if you put the fonts in the application's Fonts folder (*username*: Library: Application Support: Adobe: Fonts, for example). Multiple Master fonts will also work in Classic, as long as you have Adobe's ATM Deluxe or ATM Light (version 4.6.2 or later) in your Classic System Folder.

Are Your Fonts Conflicted?

If you're using your Mac to supply files for professional printing, you'll probably want to use a font

manager (as described in the next section). If you don't plan on using a font manager, pay close attention to this section.

When an OS X–native application asks the system to find a font, the system takes the first match it finds. So if you have, for example, Helvetica in more than one place, you could be asking for trouble. (Since the Classic subsystem looks only in the Fonts folder inside the Classic System Folder, applications running in Classic have it a bit easier.)

In the old days of OS 9, graphics and publishing professionals used to leave only essential fonts in the System Folder—Geneva, Chicago, Charcoal, and Monaco. It was OK to leave these four in place because professional publishing documents almost never used them, so there was very little chance of a font conflict.

OS X, on the other hand, stores publishing stalwarts Helvetica, Times, Courier, Symbol, and Zapf Dingbats in dfont format at the lowest OS X font level. They can't be removed—even by an administrator. But what if you want to use your own PostScript versions of some or all of these fonts?

If you put the fonts only in the Classic Fonts folder, applications running in Classic will use them correctly, but OS X–native applications won't see them—they'll be overridden by the dfont versions in the System: Library: Fonts folder. The solution is to put these fonts in two places: the Classic Fonts folder and the Fonts folder in your Library folder (*username*: Library: Fonts).

Take Charge With programs such as Extensis Suitcase 10, you can gain complete font control in OS X.

If you work in a prepress or print shop, this solution isn't the best. If you receive a file that uses a specially kerned version of Helvetica, for example, and that Helvetica was not supplied with the job, the file will still preflight correctly—the preflight tool will find Helvetica active in the system and won't know it's using the wrong version of the font. With manual font management, there's currently no way around this.

Better Font Management

If you're in design, prepress, or print production, you probably select fonts on a per-job or per-client

Type Tools

COMPANY	PRODUCT	PRICE	1	2	3	4	5	CONTACT
ALX Software	CharView	$10	•					support@alxsoft.com, www.macinsoft.bizland.com
Baytex	FontShow	free		•				www.baytex.net/BFS/
Corpus Callosum	eBookfaces	free		•	•			847/328-7363, www.corpus-callosum.com
Creative Box	FontViewer	$10	•	•	•			www.creativebox.net
Creative Box	Mini FV	$5		•				www.creativebox.net
DiamondSoft	Font Reserve	$100 (download, $90)		•	•	•	•	415/381-3303, www.diamondsoft.com
Extensis	Suitcase 10	$100		•	•	•	•	800/796-9798, www.extensis.com/suitcaseten
Insider Software	FontAgent	$70				•		800/700-6340, www.insidersoftware.com
Lemke Software	FontBook	$10		•	•			lemkesoft@aol.com, www.lemkesoft.com
Mikaël Lechat	FontCatalog	$5			•			http://mymac.online.fr/software.htm
Morrison SoftDesign	FontDoctor X	$70	•	•	•	•		704/875-1337, www.morrisonsoftdesign.com
Morrison SoftDesign	FontVista X	$30		•	•			704/875-1337, www.morrisonsoftdesign.com
Nexsus Innovations	TypoSync	$12					•	ts_support@nexsus.net, www.nexsus.net
Pixits	FontExampler	free		•				contact@pixits.com, http://homepage.mac.com/pixits/
Ronaldo Nascimento	Type Table X	free		•				www.ronaldo.com/projects/typetablex/
To The Point Software	The Fontz	$10		•				contact@ttpsoftware.com, www.ttpsoftware.com
Vincent Software	X Font Info	free		•				vjalby@kagi.com, http://homepage.mac.com/vjalby/
Vincent Software	X Font Manager	$12		•			•	vjalby@kagi.com, http://homepage.mac.com/vjalby/
Vizspring Software	Typeset	$15		•				www.vizspring.com
WünderMoösen	FontChecker X	$15	•	•				sales@wundermoosen.com, www.wundermoosen.com

1 Key Caps–style viewers let you press a key and see the symbol (glyph) corresponding to that key.
2 Waterfall-style viewers display "quick brown fox" or other font samples, sometimes for multiple fonts simultaneously.
3 Spec-sheet printers display or print a list of fonts, along with sample output from each selected font.
4 Analysis and repair utilities locate, report, and sometimes repair damaged font files; some utilities can reorganize your fonts alphabetically or otherwise.
5 Management (activation) utilities allow you to activate and deactivate fonts dynamically.

HOME SWEET HOMES

In OS 9, storing your fonts was a relatively simple task. But in OS X, which is designed for multiple users, there are six different locations for fonts; where they should be stored depends on how they are going to be used. The system looks for them in this order:

LOCATION	DESCRIPTION
The application's Fonts folder (Users: *username*: Library: Application Support: Adobe: Fonts, for example)	Some applications, such as Adobe InDesign 2.0, have private font folders. In such a case, this folder takes precedence over other font folders, but only for the specific application. Multiple Master fonts will currently work only in this location for OS X applications.
Users: *username*: Library: Fonts	If you have a single-user Mac and don't run applications in Classic, this is where you should put all your fonts. Don't put them here if you run applications in Classic; put them in the Classic Fonts folder so those applications will find them.
Library: Fonts	Only an administrative user can add or delete files in this folder. On a multiuser Mac, the system administrator should place fonts common to all users here. Don't worry about this folder on a single-user Mac.
Network: Library: Fonts	Again, this folder is nothing to worry about if you're running your own Mac. It's actually a network location on an OS X server running NetInfo; a "universal" set of fonts can be kept here.
System: Library: Fonts	All fonts used by OS X itself are here. No user-supplied fonts should be put in this folder.
Classic System Folder: Fonts	If you're running applications in both Classic and OS X and you don't use a font manager, this is where you should put all your fonts. This is the only folder that Classic can get fonts from, and OS X applications can also use them.

« basis. Or perhaps a specific group of fonts is supplied with each job, and you must use those fonts (and only those fonts) in that job. Although you could have all the fonts on your Mac active simultaneously, you would spend all your time scrolling through endless font menus. Worse than that, you'd risk confusion and possibly incorrect output with identically named fonts from different foundries. You could control your fonts with AppleScripts or Unix Shell scripts, but there's an easier way.

The solution to this problem is font management: controlling fonts so that only a select few are active at any one time, and enabling the use of fonts in any user-defined location. OS 9 crashes if you have too many fonts open—although OS X doesn't, scrolling through a long font menu is still a headache. At press time, there were two commercial font managers available for OS X: Extensis's Suitcase 10.1 (♦♦♦♦½; *Reviews*, April 2002) and DiamondSoft's Font Reserve 3.0 (♦♦♦♦; *Reviews*, June 2002). Alsoft's Master Juggler hasn't been ported to OS X—the company has said nothing about its plans for this utility—and Adobe has announced that it won't release an OS X–native version of ATM Deluxe.

Both Suitcase and Font Reserve do an excellent job of managing and activating fonts in OS X—and both have demo versions available, so you can try them out before deciding on one. Once you install and learn to use one of these font managers, you're done; they mask most of the complexity of font manipulation. They'll even handle the previously mentioned preflight problem: you can set up Suitcase to override system fonts, while Font Reserve actually lets you remove troublesome fonts from the System: Library: Fonts folder and manage them yourself. If you do remove these fonts, make sure you immediately activate them with the font manager; certain OS X applications (TextEdit, for one) will crash if they can't find Helvetica.

Note that OS X's Font Panel—which is available in most Cocoa applications (open TextEdit and press ⌘-T for a look)—is not a true font manager. It does help organize fonts, but it doesn't activate and deactivate them.

Font managers can also be useful in a network environment. If you have a fairly robust network and a central location where you store fonts, you can point your font manager or your Mac to a font server volume and open fonts from there.

Useful Font Utilities

Apple includes Key Caps in OS X (Utilities: Applications), and the utility works pretty much as it did in OS 9. Unfortunately, Key Caps doesn't understand Unicode, so many of the characters in Unicode-savvy fonts such as Zapfino or Lucida Grande (both included with OS X) are inaccessible.

Key Caps now displays font menus merged by style. All styles for a font are shown in a submenu, so instead of seeing B Times Bold listed in the menu, you'll see only Times; its accompanying styles are in its submenu. In OS 9, this feature was provided by various third-party utilities, most commonly Adobe Type Reunion. At press time, there was no equivalent utility that performed this function in OS X (for a list of OS X font utilities, see "Type Tools")—each application is left to its own devices to show font menus, either merged or "flat" (for example, the PostScript Times boldface font would be displayed in the font menu as "B Times Bold").

Don't Fear the Fonts

The font technology in OS X is more sophisticated than ever, but it doesn't have to be confusing. Many interesting developments—mostly related to Unicode and something called Apple Advanced Typography (AAT)—are on the horizon. (AAT, which came out of the defunct QuickDraw GX, works with a part of the OS called Apple Type Services for Unicode Imaging [ATSUI]. It allows for typographical effects such as fractions, complex ligatures, and connecting letters together in cursive fonts.) For now, stick with the two main font locations (Classic's Fonts folder and *username*: Library: Fonts), and you'll be just fine. And if your job involves using a wide variety of fonts, consider investing time and money in a font manager. □

CHUCK WEGER is the president of Elara Systems, a publishing-technology consulting firm (www.elara.com). More than a decade ago, he invented the concept of preflighting for publishing workflows.

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Macworld
THE MAC PRODUCT EXPERTS

The Winds of Change

If Chuck Darwin and the star-crossed dodo have taught us anything, it's that we must accept change or face an uncertain future. This idea pervades July's *Mac 911*, in which I examine the evolving Mac OS by considering questions about Classic privileges, DVD playback under OS X 10.1.3, and OS X display options. Turning to hardware, I address the mysteries of the iMac's missing reset switch, digital-audio output on Power Mac G4s, and creating iPod contacts. I'll also investigate vexing "Intermittent Problems" and tardy Macs.

The Privileged Class

When I try to start OS X's Classic environment (either from System Preferences or by launching an OS 9 application), I get the following message: "You do not have sufficient permissions to run Classic from /System/Library/CoreServices. Please correct permissions and restart Classic."

ILLUSTRATION BY LEO ESPINOSA

I'm the sole user of my G4/466 running OS X 10.1.2 and OS 9.2.2. I'm logged in as the administrator. How do I correct these permissions?
Adam Weiss, *Macworld Forums*

On occasion, OS X's Unix underpinnings are more apparent than many Mac users would like. Take permissions (please!), for example. In Unix, files and folders belong to a specific user and group. By granting permissions to others, the owner of a file or folder determines who can view and alter it. In OS X, permissions are called *privileges*. (See "Many Users, One Mac," *Secrets*, May 2002, for a lot more on permissions.)

It seems that the privileges for the Classic Startup application on your Mac are munged up. If you follow the path in the error message—System: Library: CoreServices (meaning the CoreServices folder inside the Library folder inside the System folder at the root level of your OS X volume)—you'll spy an application called Classic Startup. Click once on its icon and press ⌘-I to produce the Classic Startup Info window. Select Privileges from the pop-up menu. When your OS is set up correctly, you should see the owner listed as system and the group listed as wheel.

Given that your privileges likely aren't set this way, you can put them right with one of two utilities I favor—Renaud Boisjoly's free BatChmod (www.versiontracker.com) and Gideon Softworks' $10 FileXaminer (www.gideonsoftworks.com). FileXaminer is the more complete utility; it lets you easily change file privileges to match common situations—for example, when you want to create a read-only drop box—but either of these tools lets you perform the simple task of changing a file's or folder's privileges (see "Information Station").

Just open one of these programs and go to the Classic Startup application. In the resulting window, change privileges so that the owner is root (what OS X calls *system* in the Show Info window) and the group is wheel; then click on Apply. To make these changes stick, you must enter your administrator name and password when prompted.

Movie Viewing

After upgrading from OS X 10.1.2 to OS X 10.1.3, I was shocked that I couldn't display DVD movies on a TV in mirroring mode. Apple says that OS X 10.1.3 doesn't support the S-Video–out port on my new PowerBook. Is this true?
Mike Kohler, *Whitehorse, Yukon, Canada*

No. Although it's true that OS X 10.1.3 won't let you display a movie on *both* your Mac's screen and your TV, you can display it on your TV via the PowerBook's S-Video–out port. Here's how:

After connecting the TV to your PowerBook via the S-Video cable, open the Display system preference and go to the Arrange tab. Make sure that Video Mirroring is selected. Then select the Display tab and click on the Detect Displays button. Locate the Television window (it may be tucked behind the

Color LCD window) and select 640 by 480 60Hz from the list of available resolutions. You should now be able to launch DVD Player and watch the movie on your TV. If the movie doesn't stretch to the edges of the TV screen, return to the Display system preference and select 640 by 480 from the list of available resolutions.

Talking 'bout a Resolution

How can I change screen resolutions in OS X as easily as I can from OS 9's Control Strip?

David Eldridge, *Spokane, Washington*

You'll find that it's nearly as easy—just open the Displays system preference and activate the Show Displays In Menu Bar option. With this option on, a Display-menu icon materializes in the Mac's menu bar; beneath that appears a list of the resolutions recommended for your display. If you want to use a resolution *not* recommended for your display (640 by 480 on an Apple Studio Display, for example), you must deselect the Show Modes Recommended By Display option and select one of these unworthy resolutions from within the Display system preference—they won't appear in the Display menu.

I say that it's *nearly* as easy in OS X because in OS 9.2 and earlier you can view *all* the resolutions that will work with your Mac (not just those recommended by Apple) by control-clicking on the Control Strip's Resolutions module.

Switching Switches

My flat-panel iMac doesn't have a reset switch. How do I reboot my computer if I get stuck?

Daniel Strickland, *Omaha, Nebraska*

The new iMac doesn't have an obvious reset switch; however, you can reset it. Apple suggests that you press and hold the power button for five seconds when your iMac is unresponsive. In most cases, this will restart your iMac—and, of course, cause you to lose unsaved changes in open documents. If holding down the power button doesn't work, unplug the computer.

Apple is a bit shy about discussing another way to reset your iMac—a method that only experienced users should employ, only if their iMacs seem to have given up the ghost. Beneath the bottom cover plate, just below and to the right of the AirPort connector's right edge, is the PMU (Power Management Unit) switch. Pressing this switch can cause a seemingly dead iMac to rise again. Apple is reluctant to discuss this process for good reason. If you aren't careful, you can quickly drain your iMac's internal battery—a part that is not user serviceable (so you'll have to take your machine to the shop and pay for the privilege of having the battery replaced).

Now that you've been warned, here's how to proceed: Disconnect the iMac's power cord. Place your iMac face down on a soft surface, remove the bottom plate, and press the PMU switch *once*. Pressing it more than once may crash the PMU chip, which can shorten the life of the internal battery to about two days. Wait at least ten seconds before plugging in the power cord and firing up the iMac. (This procedure resets the iMac's PRAM settings, so once you've restarted your computer, be sure to reset the date and time.)

Information Station

Gideon Softworks' FileXaminer lets you avoid twiddling in Terminal when you want to change file and folder privileges in OS X.

Irregular Difficulties

The modem in my blue-and-white Power Mac G3 can't find a dial tone if I haven't turned on the Mac for a few days. Once the Mac has been running for a day or so, the modem works again. Any ideas as to what the problem might be and how to fix it?

George Allen, *Ann Arbor, Michigan*

George, you've been bitten by every troubleshooter's bugaboo—the Intermittent Problem. Although such problems can be vexing, yours provides a clue that makes it easy to diagnose and solve. That clue? *Heat.*

You may recall from your elementary-school science classes that heat causes objects to expand. The fact that a chunk of your Mac's hardware doesn't work when you fire up your computer, but does function when the Mac has had a chance to cook for a while, indicates that this expansion effect may have improved a poor contact.

I suggest that you switch off the Mac, flip down its side door, disconnect the phone cord, and unseat and reseat the modem card. Doing this should establish a stronger, more reliable bond between your modem and Mac.

For the rest of you confronting an Intermittent Problem that involves any kind of cabling—this can be a keyboard, monitor, or just about any external peripheral—first make sure the cable is firmly seated. Unplug it and plug it back in. (Do this only with hot-pluggable cables—phone cords and USB, monitor, and FireWire cables, for example. Don't hot-plug SCSI and ADB cables— >>

TIP OF THE MONTH

OS X–native applications sometimes put their windows beneath the Dock, making them partially inaccessible. I've found that if you toggle the Dock's autohide feature on and off by pressing ⌘-option-D, the offending window will become Dock-aware—it resizes itself so that it is no longer hidden.

Ben Everson, *Boulder, Colorado*

UNSOLICITED ADVICE

Apple was kind enough to include a configurable equalizer (EQ) as part of the iPod Software 1.1 update, but how the EQ settings in iTunes interact with the iPod is a little confusing. iTunes 2 users undoubtedly know that you can assign an EQ setting to an individual song by clicking on the song, pressing ⌘-I, clicking on the Options tab, and choosing an EQ setting from the Equalizer Preset menu. When you move songs to your iPod, these EQ settings move right along with them, but you can't utilize them unless you configure the iPod correctly.

If, for example, you have the iPod's EQ switched off, songs that have an assigned EQ preset won't play with that setting. Instead, your songs will play without the benefit of EQ. If you set the iPod's EQ to Flat, the EQ you preset in iTunes 2 will play on the iPod. If you select one of the other EQ settings on the iPod (Latin or Electronic, for example), songs without EQ presets assigned in iTunes 2 will use the iPod EQ setting. Songs with EQ settings assigned in iTunes 2 will use the iTunes 2 setting.

To hear how a particular song sounds on your iPod with a different EQ setting, start playing the song on the iPod and then press the Menu button until you return to the main screen. Select Settings, then EQ, and then one of the EQ settings. The song will immediately take on the EQ setting you've chosen, but it won't stick on subsequent playback. If you want to change the song's EQ more permanently, you must do so in iTunes.

<< switch off the Mac and peripheral, and swap cables.) If that doesn't do the trick, try a different cable.

The Mac That Time Forgot

Whenever I set the time on my Mac, within a week or two the clock is off by as much as ten minutes. I never shut the computer off and have it in sleep mode during the night. Why does this happen?

Jason Sheen, *Lehi, Utah*

Because Macs are not made by the Swiss. A common misconception is that because a Mac is capable of performing so many miracles, it's also a high-precision timepiece. It is not.

But it can be—if you have an Internet connection. In OS 9.2 and earlier, open the Date & Time control panel, select the Use A Network Time Server option in the resulting window, click on the Server Options button, and then click on the Set Time Now button in that window. Your Mac will go to the Web and synchronize the system clock with the correct time. The same Server Options window offers two options for automatically synchronizing the Mac's clock.

In OS X, the Network Time Server option is under the Date & Time system preference's Network tab. Here you'll find the same Set Time Now button and the option to use a network time server automatically.

Speaking of Speakers

I'd like to connect my Power Mac G4 to my stereo so I can play MP3s through the stereo *and* through my Mac's speakers. Apple's digital speakers won't work when I plug my stereo into the Mac's headphone jack. What gives?

Andy Milder, *Santa Monica, California*

The Mac is trying to be considerate of those around you. (If you're engaged in a late-night Myth session, those nearby are not likely to be pleased with your trumpeting speakers.) Regrettably, there's no way around this enforced quietude. Once jack meets headphone port, digital-audio output is silenced.

But Griffin Technology has a solution: the $99 PowerWave (www.griffintechnology.com). This USB audio adapter, which should be released by the time you read this, supports many audio-input and -output options. Two of these options are output to digital speakers and line-level output to other audio devices via ⅛-inch Walkman-style miniplug or RCA jacks. Both outputs are "live," so you can send an audio signal to your speakers and stereo.

I Need Contact

I'm thrilled that the latest iPod software allows me to store contacts on my iPod—but I'm not sure how to go about it.

Krista Spence, *Los Angeles, California*

To make this work, you must mount your iPod as a FireWire drive: connect your iPod to the Mac via the FireWire cable, launch iTunes 2, select your iPod in the Source list, and click on the iPod Preference button in the lower right corner of the iTunes window. In the resulting iPod Preferences window, select the Enable FireWire Disk Use option.

Once your iPod is mounted, there are a couple of ways to put contacts into it. To move them manually, open any application that supports the vCard contact format—such as OS X's Address Book, Microsoft Entourage, and Palm Desktop (version 4.X only). Select the addresses you want to place on your iPod, and drag them to the Contacts folder inside your iPod. Unmount your iPod by dragging it to the Trash, and disconnect the FireWire cable. You'll find your contacts under your iPod's Contacts heading.

If you're running OS X and want to pull contacts from either Address Book or Entourage, Apple has created AppleScripts that make the job easier. The Address Book To iPod and Entourage To iPod scripts automatically move your Address Book and Entourage contacts into your iPod's Contacts folder. They also offer you the option of viewing your contacts' first names first or their last names first. You can find these scripts at www.apple.com/applescript/ipod. □

Contributing Editor CHRISTOPHER BREEN is the author of *Mac 911* (Peachpit Press, 2002), a Macintosh tips and troubleshooting guide designed specifically for human consumption.

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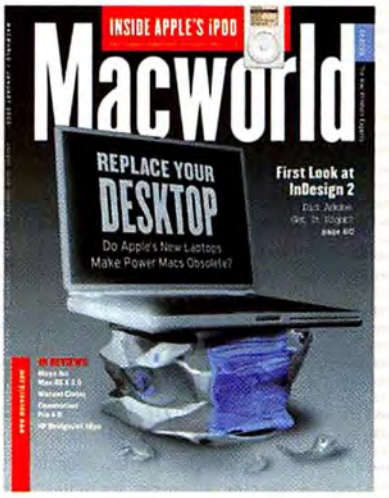

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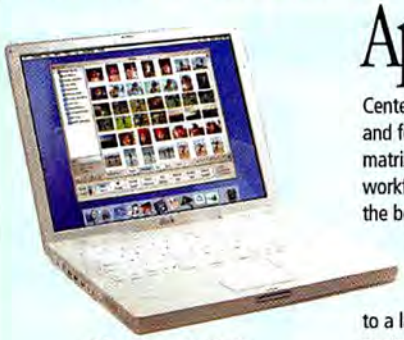

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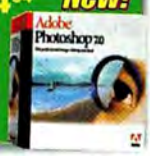

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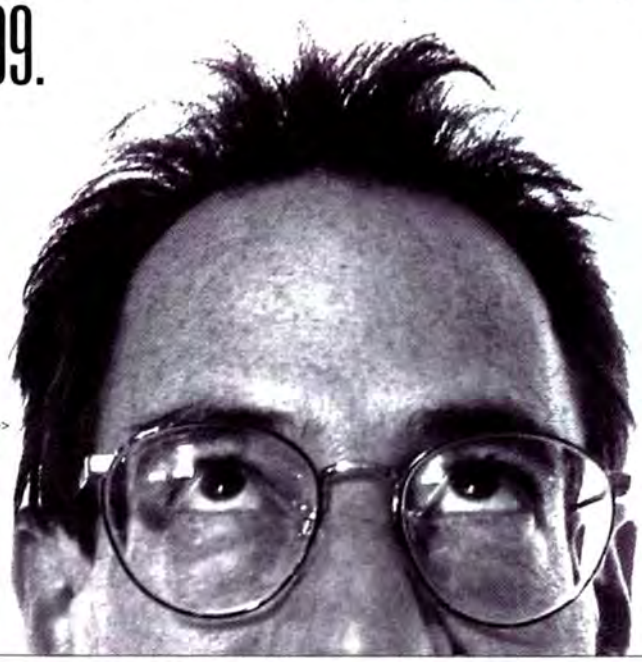

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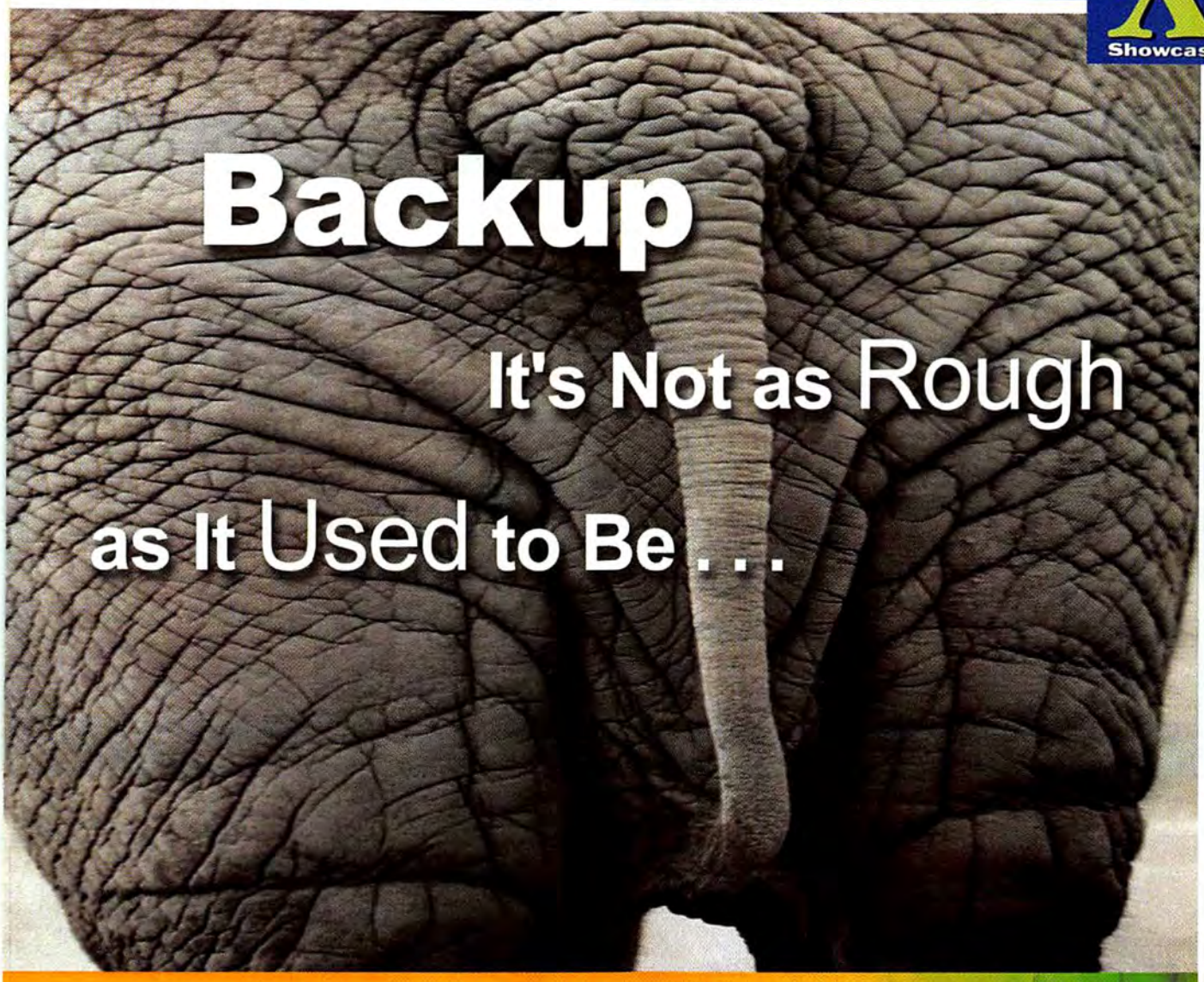

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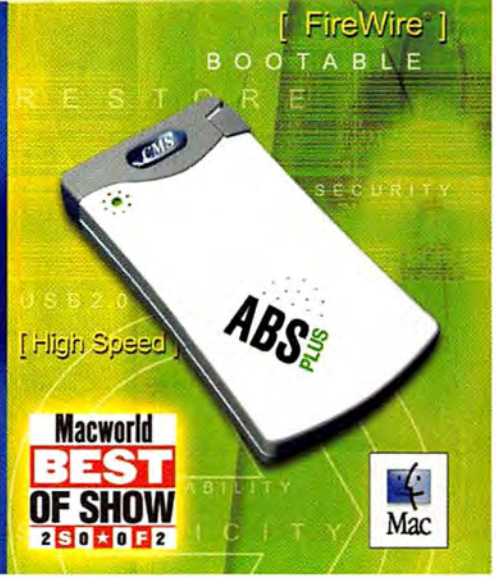

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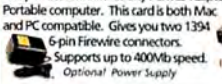

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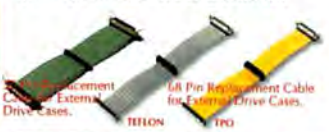

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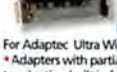

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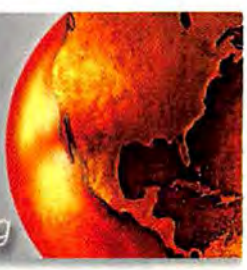

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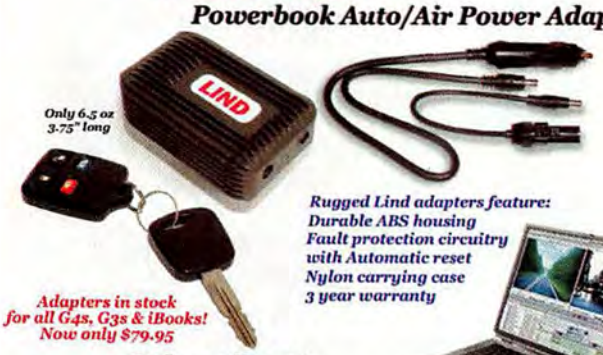

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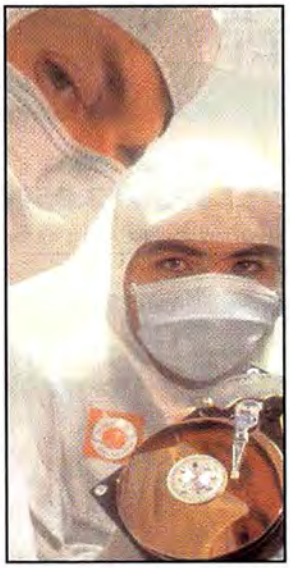

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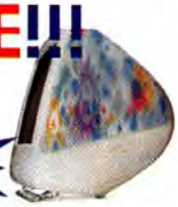

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pages spilling out of a nearby laser printer. Until Apple's recent announcement, the notebook would have had an "Intel Inside" sticker on it and the stunned onlookers would have been asking, "Gee . . . can a Mac do that, too?"

And imagine if the Bluetooth consortium reaches its goal of low-power Bluetooth implementations that cost well under five bucks a unit. Imagine a not-too-distant future in which your neighborhood dry cleaner adds "Chipping—$3.50" to its catalog of services. In this push-button world, a little box in your front hallway will discreetly poll your outfit as you pass by. If it hears from your brown oilskin fedora, brown WWII-style leather jacket, olive work shirt, tan pants, and brown work boots, it'll lock the front door and light up an eye-level screen with a message that asks, "Are you aware that you're going out dressed like Indiana Jones?"

> In this day and age, it's important to be a real standards slut.

And then you'll slap your forehead, go back upstairs, and change into some jeans. And that's much better than figuring out your outfit's flaws after the dinner party, when you're gassing up the car for the drive home and thinking about how everyone in the restaurant was smiling and giggling at me—giggling at *you*. I meant to say *you*.

Hey, Standard, New in Town?

So you don't share this dream of Bluetooth Pants? It doesn't matter. In this day and age, if you're captaining a computer operating system, it's important to be a real standards slut. Get into bed with anything that won't damage your relationship with other, more possessive standards committees, I say. Dress up like Christina Aguilera and hang out by the docks if necessary.

It's an essential truth, even if the benefits of such a technology seem vague at times. When it comes to standards such as Bluetooth, which is inexpensive enough and useful enough to potentially infect all aspects of consumer culture, investing some modest time and money to make sure Mac OS can happily deal with it is just simple common sense.

For the longest time, Apple's reaction to this exciting new technology was chilling: *We continue to evaluate Bluetooth as we wait for both the robustness of the core technology and its market penetration to clarify its proper place within the Macintosh paradigm.*

That's like saying, "Hey, let's stroll over to that fryer full of boiling oil and bob for chicken!" It's the sort of thinking we'd expect to hear from Spindler's Apple, not from Jobs's. □

The only thing Contributing Editor ANDY IHNATKO (www.andyi.com) doesn't like about Bluetooth is that exposure to the name causes him to talk like a cartoon pirate for hours on end.

ANDY IHNATKO

Apple Embraces a Truly Cool Standard

Avast, Ye Bluetooth!

IT LOOKS AS THOUGH NOBODY ELSE IS GOING TO STEP IN, so I guess I'd be foolish *not* to take all the credit for Apple's decision to finally support Bluetooth. Y'see, I wrote a column advising Apple to do just that about a year ago (August 2001). Then there was the column in which I insisted that the iPod could become a *truly* revolutionary product if Apple gradually but steadily expanded the scope of the iPod's firmware until the MP3 player became a Pocket Viewer for Digital Content in General (February 2002). And hey, now you can view your address book on the thing, thanks to a firmware update released soon after that column ran.

Please, please! No need to thank me for the flawless and confident manner in which I've been unerringly piloting the Mac platform toward the shining star of excellence; when Apple rushes to integrate my advice into its products, I benefit just as much as you do. (Humor me. I've got my annual performance review coming up, and if I can keep *Macworld*'s publishers convinced that Andy Ihnatko is an essential part of what keeps the entire tech industry afloat, that 3.4 percent cost-of-living raise is as good as mine.)

The Sensible Thing to Do

I can't remember the last time such a matter-of-fact product announcement made me as happy as did Apple's announcement of support for Bluetooth. There was no fancy museum-quality poster of Apple's Bluetooth product available after the announcement, and there never will be. The Bluetooth USB adapter is an ugly little thing that Apple isn't even manufacturing. But man alive, did I breathe a sigh of relief when I heard the news.

Apple has dodged a bullet, which is to say that it has managed to reverse a really dumb decision. Reversing dumb, largely arbitrary decisions isn't something Apple has traditionally shown any real knack for—not unless you include all the times an incoming Apple CEO began his reign by ritually trashing all of his predecessor's decisions.

In case you need a refresher on Bluetooth, I'll say that it's a wireless-networking technology with modest goals. While AirPort is designed for fast speeds, long distances, and complex hardware, Bluetooth has the potential to be essentially an alternative to physical cables, throwing signals a dozen yards or so from your Mac to a printer, handheld computer, cell phone, keyboard, or mouse.

Bluetooth has two characteristics that make it an important standard. First, it configures and runs itself. If a piece of software wants a printer, Bluetooth gives a yell and finds one, negotiating and establishing the connection on its own. Second, adding Bluetooth technology to any product costs only ten bucks, and that amount is decreasing as more chip sets are manufactured.

Supporting Bluetooth is important to Apple because the company positively, abso-didley-utely must support any technology that offers an impressive demonstration in just ten seconds.

You know how many computer shoppers walked out of malls with Macs instead of Wintel boxes thanks to iMovie? I've got the exact figure from Apple's 2001 annual report right here: "plenty." Imagine the scene in a major outer-ring-suburb shopping mall, the kind with multiple Baby Gap infestations and an indoor skating rink. A man has come to buy a computer. He's such a technical newbie that he still can't even say *computer* without preceding it with the definite article, as in "Someday I hope to learn the computer as good as my nephew Lyle." When the PC industry decided to make commercials featuring people flying around to disco music, this is the guy they had in mind.

He's not even that much of a Madonna fan, but the commercial asked him where he wanted to go today, and his default answer to such questions is "The mall." So here he is, headed for Best Buy with his charge plate—another modern term he has yet to get the hang of.

But then, through the front window of the mall's Apple Store, he spies someone editing video on a Mac.

His unbelieving eyes detect the presence of an earthly miracle, for—glory be!—it actually looks both easy and fun. "Can I do that on that Madonna computer?" he then asks, and after being assured (truthfully, at least by marketing standards) that he can't, the sale is made.

> Apple has dodged a bullet and reversed a really dumb decision.

I mean, understanding the ginchiness of Bluetooth isn't like understanding the greatness of the Mach kernel. Enlightenment comes to the masses as soon as you bring a Bluetooth-equipped notebook into an office, tell your word processor to print something, and within moments get

< continues on page 123

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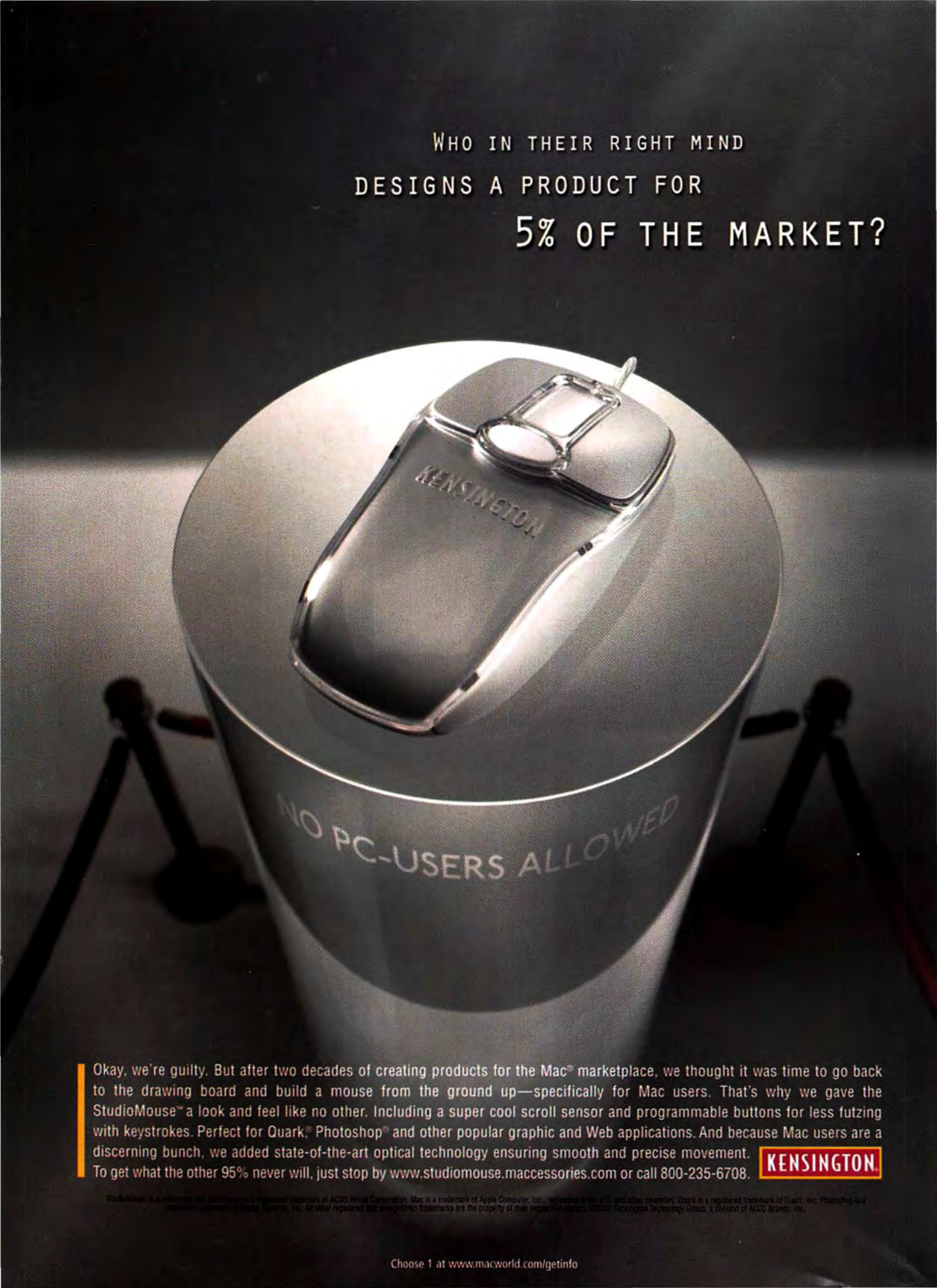

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