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Macworld
Conference & Expo.
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Macworld

Perfect Prints

REVIEWED: 12 ONLINE PHOTO SERVICES, 5 HIGH-QUALITY PHOTO PRINTERS



Plus | New G4 Chip | GoLive 6.0 | Automate Your Mac | Mac OS X Users and Groups

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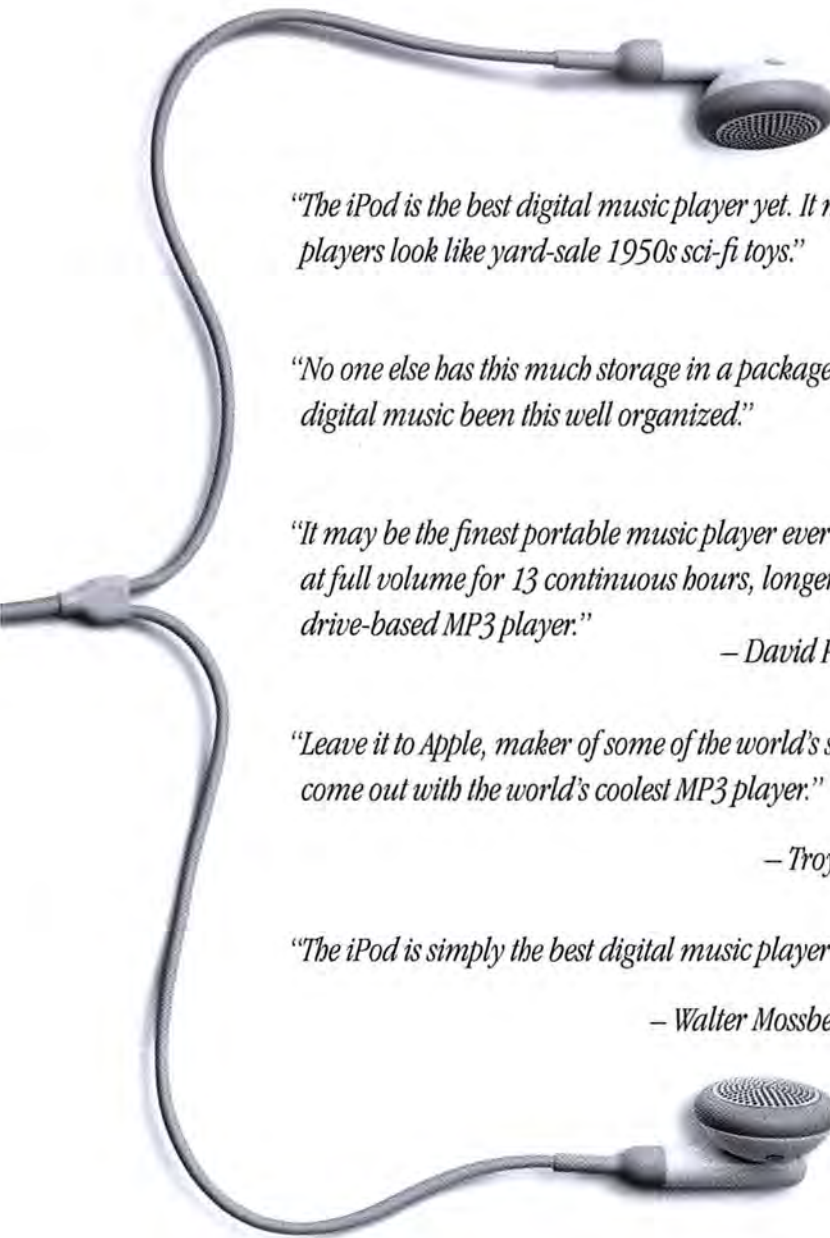


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— David Pogue, The New York Times

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Illustration by Chris Nurse

June 2002

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Macworld

Incorporating MacUser

COVER STORY

70 Turn Pixels into Prints

JASON SNELL

Digital photography has many pluses, but it adds an extra step: turning what you see on your Mac's screen into tangible prints. Though iPhoto is an easy way to print your images, it's not the only game in town. We've tested 12 online photo services and five of the newest ink-jet photo printers, and we can help you decide which route is better for you.

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80 Macromedia's Dynamic Duo

DAVID SAWYER MCFARLAND

With the newest versions of Macromedia's Web-publishing team, Dreamweaver MX and Fireworks MX, you'll have all the tools you need to build a simple Web page or a database-driven Web store. Here's our exclusive sneak peek at the face of things to come.

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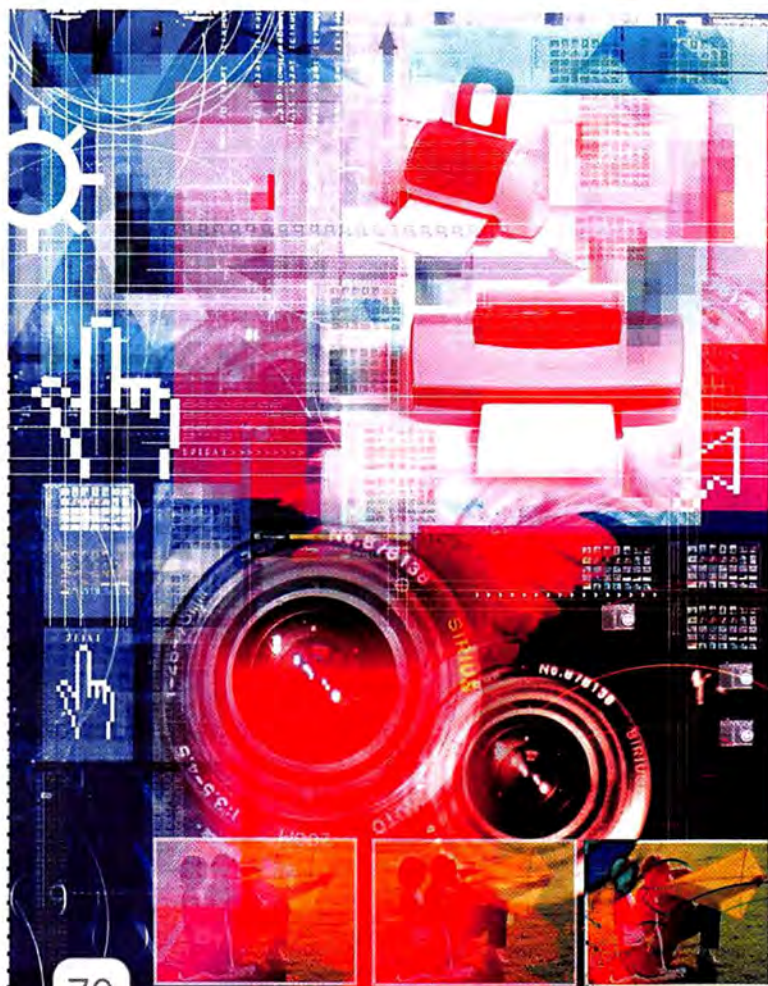
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Get to know the diverse worlds of 4x4 Evolution, Civilization III, Icewind Dale, and RealMyst.

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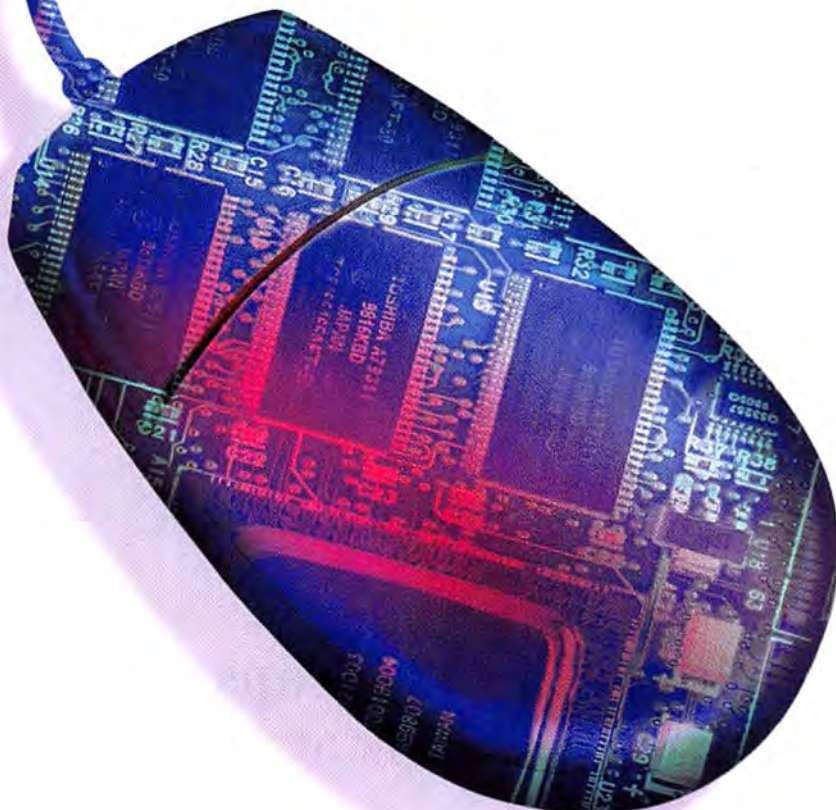
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This Is a Great Time to Love Digital Imaging

Photo Play

PHOTOGRAPHY IS ONE OF MY PASSIONS. WHEN I WAS 13, MY father gave me his old Agfa 35mm range-finder camera, and I've been a confirmed shutterbug ever since. Sure, in my (much) younger days, I spent time in darkrooms. But the digital darkroom has captured my fancy in a way traditional photography never could.

It's one reason I love my job. Over the years, I've had the opportunity to work with the latest imaging technology: scanners (including some very cool drum scanners), digital cameras, and printers. These days, this field is pretty fun to play in, but back in the early days of digital imaging, getting the perfect print was an exercise in frustration—or required the use of supremely expensive technology that the average Mac user would never even think of buying.

Anyway, I probably spend more time than I should playing around with pictures. I *like* getting ink on my hands. I think nothing of tweaking an image any number of ways just to bring out a small detail in its lower left-hand corner. I've become an imaging snob, and I have to face that fact.

I'm in the minority, however. Most people want to snap a picture, download it to a Mac, and get a 4-by-6-inch print. They don't want complications; they want to put Apple's much touted digital hub to work. I'm reminded of this every time my wife asks me, "Why can't you just print the damned picture?"

When we started discussing the digital-photo story in this issue, I took the admittedly snobbish viewpoint that there was no way anyone would want to use an online photo service to get prints. It would take too long, and it would prevent tweaking and printing images over and over until you got them right. Better to buy a photo printer, have fun, play around, and print a lot.

I still think that anyone truly serious about digital imaging should invest in a photo printer; they're marvels of technology at pretty amazing prices. And if you're willing to invest the necessary time, you can produce excellent pictures with the help of an unbelievable array of software, paper types, and inks. (Lyson's new Small Gamut inks [www.lyson.com], for example, look as though they'd be perfect for photographers interested in platinum-, selenium-, or sepia-toned digital prints.)

However, it's hard to argue with the convenience of an online printing service—especially if you don't really want anything more than standard prints, or if you don't think you're going to print that many images. Sometimes you just want the damned picture,

and it's easier to let someone else do the heavy lifting. Even an imaging snob like me can understand that.

Macromedia Returns

One of the most common questions among industry insiders over the past few months has been "What's happened to Macromedia?" The company blew out of the gates a year ago with FreeHand 10, the first professional drawing application for Mac OS X. Then it seemed to fall off the map—in the Mac market and everywhere else. A large part of that was obviously related to the company's ongoing financial issues and its merger with Cold Fusion developer Allaire, but it was disquieting to see such a strong company disappear from the radar screen like that.

As you'll read in David Sawyer McFarland's first look at the new Dreamweaver MX and FireWorks MX (elsewhere in this issue), Macromedia is back, with a plan to tie all its disparate products into a hub that lets anyone—from rank amateurs like me to Web professionals—build dynamic Web sites easily. It's nice to see the company back in force and committed to the Mac.

More Changes in Reviews

Every month, *Macworld's* crack team of reviewers evaluates anywhere from 20 to 40 new Mac products and, inevitably, finds products that have a problem or two—and those problems lead to lower mouse ratings. Also inevitably, most companies release minor updates that fix those bugs, add a few features, or simply make a program work better. Until now, *Macworld* hasn't really had a place to cover those interim updates; this month, we've added a new feature, *Reviews in Brief*, designed to follow up on those revisions. *Reviews in Brief* will also include coverage of small, useful products that deserve our (and your) attention but don't call for a lot of words in their reviews. The new feature is part of our *Reviews* section. □

I've become an imaging snob, and I have to face that fact.

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.



PHOTOGRAPH BY BETTINA SALOMON

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Age-old Debates

Macworld readers have never been shy about sharing their opinions on everything from tax software to the aesthetics of iPod carrying cases. And while we expected our March issue to spark yet more heated debate about OS X, the most-passionate letters have been about . . . other letters. A few readers, fed up with complaints about OS X, suggest that critics of the new OS are clinging to the past. Hopefully, the negative feedback we've received about the new iMac will not inspire a wave of letters declaring that the naysayers would be happier using slide-rules and abacuses. □

OS X-Ready Readers

JOHN HALE

Your article "Feel at Home in Mac OS X" (March 2002) helped me make the change to OS X. I had concerns that my 17-inch Apple Studio Display (LCD) with a Dr. Bott DVIator wouldn't work with OS 9.2, and that proved to be true. But MacFixIt (www.macfixit.com) supplied enough information to work through that problem. Christopher Breen's closing statement sums it up for me: "Now that your files are in place, your links to the Internet and network are established, and your printer is present and accounted for, you and your Mac should feel much more at home."

JERRY STRATTON

In your article, you recommend setting aside 1.5GB for an OS X installation. Allowing so little disk space for OS X is likely to mean that you can't perform any OS X upgrades, which require hundreds of megabytes of free space. Also, taking up 1.5GB won't leave enough disk space for applications. Though you can install OS X applications on a different volume from the OS X one, doing so means that you won't be able to take advantage of extra features such as services. Finally, 1.5GB won't leave much space for virtual memory (it's possible to move virtual memory from the OS X volume, but only the extremely technically inclined should attempt it).

CHRIS SAUNDERS

OS X has the potential to be everybody's friend. Average users can burn a CD without touching a manual. Advanced users can configure Darwin to run an FTP, HTTP, or SSH server daemon in the background and go crazy playing with the back end. My question is, what is Apple waiting for? Why

are there no TV commercials triumphantly claiming victory over the evil Microsoft? OS X has real business application. Unix is tried, tested, and true, and it's stabler than anything Microsoft has ever produced. Samba on Unix has been proved faster at sharing on a server than Windows NT or 2000. This should be it: the coup de grâce, the final stroke, the killing blow. But instead, Apple stays in the background.

Negative Feedback

EDDIE PRESLEY

I take issue with the ill-informed negativity that clogs letter columns and message boards. Specifically, in his "Waiting for the Apps" letter (*Forums and Feedback*, March 2002), Harold Pace describes OS X as a slow, unreliable white elephant. OS X is anything but slow on my G4/400, and on a new iMac it's damned snappy. As for being unreliable, crashing is a routine feature of OS 9 and earlier, and rebooting and recovering RAM is mandatory. OS X is much stabler, and I can leave it on all the time.

CHRIS LAUGHLIN

It's interesting that *Macworld's* readers, supposedly loyal Mac fans, write in only to complain about how horrible OS X is or how Apple should have done this or that. Maybe it's just the old geezers who don't like the new technology. I'm 17 years old, I love Macs, and I think OS X is great. Macs are the fastest, most innovative, and most technologically advanced computers out there. Things don't stay the same forever.

iMac Musings

ERIC H. WENOCUR

Reading about the new iMac ("The iMac: Flat Is Where It's At," *Special Report*, March

2002), I suddenly realized why Apple has become so infuriating. In its rush to bring out the coolest new gadgets, it embraces unproven technologies. It did so when it committed solely to USB and FireWire, despite continuing flakiness in the real world. And now Apple is ready to push LCD technology whether we want it or not. LCDs are great in some ways, but they don't compare to CRTs for many applications. When the first Mac OS arrived, it worked because the concept was brilliant. These days, though, putting only the newest—and probably short-lived—interface on every new machine is not so brilliant.

SEAN HITE

The cost difference between Macs and PCs is making it more and more difficult to justify purchasing Macs for businesses. Apple has always charged a premium for its products. For that additional cost, the user gets a far superior product, no doubt about it. But Apple's insistence on keeping the base price of its new iMacs at \$1,299 can't be good for business in today's IT purchasing climate.

ANTHONY BUROKAS

Apple has almost created the hub of my digital life, but one crucial part is missing: communication with my phone. Cute photos and iMovie go only so far. I don't make movies every day, but I do use my phone several times a day. Yet it turns out that most phones are unable to connect with Macs, and phone manufacturers and wireless services don't seem to have an interest in developing connectivity software for the Mac. So, no infrared modem for my Nokia, no phone-book synchronization on the Ericsson, no downloading MP3 songs to my Samsung: it's time for standard wire-

less connectivity for all of us who have bought into the digital hub.

RICHARD RATHE

I waited anxiously to see whether the new iMac would include something that has been missing from newer Apple hardware: sound input. Alas, it appears that the situation has not changed. My experience with third-party sound-input devices has been less than satisfactory. When I recently attempted to capture music from some of my old vinyl records (using your December 2001 article "Turn Your Cassettes or LPs into CDs" [*How-to*] as a starting point), I spent the better part of a day configuring, testing, and redoing what should have been an easy plug-and-play task.

Raskin on Raskin

JEFF RASKIN

I was pleased to see David Read's interview with me ("Mac Daddy," *Mac Beat*, March 2002). Ignoring a few small problems (like some of the quotes getting garbled and the photo being printed a bit greenish so that you're not sure if moss is growing in my beard), there is one big slip that's important to me. I'm quoted as complaining that OS X "doesn't use any of the research that I've been doing," which makes it sound as if I'm miffed at being ignored. If you read the article on Macworld.com (www.macworld.com/2002/03/macbeat/raskin.html), you will get the right idea from the context. I'm clearly saying that it is Apple's nonuse of recent and valuable knowledge about interface design (research that was done mostly by others, as I state explicitly) that is disappointing. Apple—to say nothing of the goblins from Redmond—could do a lot more in terms of making its products easier to learn and faster to use. But Apple is stuck in a 20-year-old-interface rut. Painting it greeny-blue and changing boxes to baubles doesn't make the grade.

Technical Knockout

RIC COHN

I purchased KnockOut 2 (*Reviews*, March 2002) after reading your recommendation, only to find that the program behaves like beta software. It does an excellent job with the supplied samples, but it's as slow as molasses on larger images (50MB). The program also isn't properly integrated as a

Photoshop plug-in. It requires its own large memory allocation and opens as a separate program. This experience has greatly reduced my trust in *Macworld*.

Classic Palm Problem

DAN BREY

In your review of monochrome handhelds (*Reviews*, March 2002), you state that the Palm Desktop software is not yet compatible with OS X or the Classic environment. This is not true. I've been using it in the Classic environment for over six months and have never had it crash.

Palm Desktop can work in OS X's Classic environment, although it's not supported by Palm. But there's one condition: Classic must first be running to perform a HotSync operation.—Ed.

Bad Dream

EVAMARIE WEISS

Your write-up of Auto FX Software's DreamSuite (*Reviews*, March 2002) was right on the button regarding the fact that the application's interface consumes the entire screen. I purchased this program last December, and I still haven't figured out how to get to the bottom portion of the interface to actually apply and save the effects I put on my photos. I feel like a fool, having spent 300 bucks on an application I can't use.

Taxing Software

LEE ALLEN

Your ★★★★★½ rating of TaxCut Macintosh Deluxe 2001 (*Reviews*, March 2002) is simply not justifiable. After spending two hours entering data, I got to the point of e-filing, and the program crashed. When I restarted, I found that it had not autosaved along the way. Any tax-preparation software that does not have an autosave feature shouldn't get more than two mice.

PETER HAASE

TaxCut feels as though it were at the beta level of development. Many simple things don't work, such as printing from the File menu. And while the tax information was well written and concise, help within the application itself was sparse and often misleading. The error-checking feature is kludgy, with hard-to-understand explana-

tions of potential problems. When I was done and wanted to back up a copy of my files, the backup feature simply didn't work. I have to admit that although TaxCut got the job done at half of TurboTax Deluxe's price, you get what you pay for.

iPod Beauty Tips

JOHN SHOFFNER

"Pod Protection" (*Mac Beat*, March 2002) shows a picture of the beautiful iPod horribly cloaked in a spongy, black foam nightmare. Who would consider such a nihilistic approach to preserving beauty? The iPod is one of those rare landmark confluences between man, machine, and nature. You certainly can wrap it up in any combination of foam, leather, or nylon, and it won't get a mark on it. But the essence of its remarkable beauty and craftsmanship will be lost on you. You'll be left with only the naked whirl of MP3 electrons spewing from ear buds you can't even see. And you will have unwittingly contributed to the great karmic imbalance whose debt is borne each year by Steve Jobs and his team of inspired designers. So, smudged fingerprints on its shiny case? You bet. A few scratches? Character marks, I say!

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; via fax to 415/243-3545; 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

Due to a production error, the final sentence of "QuarkXPress versus InDesign" (May 2002) was truncated. The sentence should read: "Nevertheless, if Quark is going to keep customers from defecting in the future, it must soon prove that XPress can be as innovative and cost-effective as InDesign."

To read the complete article, visit <http://network.macworld.com/qvid>.



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WILL THE NEW POWERPC CHIP MEAN A NEW DAWN FOR THE MAC? |

Apollo on the Rise



JOHN RITTER

>> Things looked bright for the Mac when the PowerPC made its 1994 debut. The introduction of the new processor, and its performance gains during the following year, caught Intel and other CPU makers completely off guard. The PowerPC—the product of an alliance between Motorola, IBM, and Apple—powered the fastest computers available to consumers, and it seemed the world would soon turn to the Macintosh.

But the rewards that a number of pundits expected never came. There was no mass exodus to the then faster Mac. The speed mantle was soon lost as the PowerPC fell steadily behind rival CPUs with faster clock speeds.

But things could be looking up for the PowerPC. The latest version of the G4 processor, code-named Apollo, made its debut earlier this year, ushering the Mac out of the sub-GHz wilderness. Will this processor—named after the Greek sun god—shine a new light on the PowerPC?

1GHz and Beyond?

Intel's Pentium processor enjoys a two-to-one clock-speed advantage over the PowerPC. Despite the public focus on the megahertz gap, Apple has continued to prosper and push ahead, rolling out a dual-1GHz Power Mac G4 in January. That Mac is powered by Motorola's new Apollo (a user-friendly name for the MPC7455) processor. Despite layoffs and the fact that 2001 was the company's first money-losing year in 71 years, Motorola is driving hard to develop faster G4s and make up for the delays of the past two years.

Motorola thinks that its Apollo processor has legs. Thomas M. Fehr, Motorola's director of strategic marketing, says the Apollo processor will soon be taken from its current 0.18-micron fabrication process down to a 0.13-micron process. Smaller fabrication processes let a CPU operate faster while consuming less energy.

"Obviously, when we take that down to 0.13-micron, we'll see some speed benefit," Fehr says.

The analysts at *Microprocessor Report* seem to agree, citing the Apollo's high clock speed with the

0.18-micron fabrication process as one of the reasons they named the latest G4 chip the best high-performance embedded processor. Rival chip makers, such as Intel and AMD, reached the 1GHz mark with CPUs manufactured using 0.18-micron processes, but those CPUs also featured drastically higher heat generation and consumed more power. Both Intel and AMD have moved to 0.13-micron processes and plan to go lower within the next year or so.

In SOI We Trust

Motorola recently upped the ante by successfully adding Silicon on Insulator (SOI) technology to the 0.18-micron process used on its Apollo chip. SOI involves the addition of a capacitance-reducing layer to the chip, making the chip's transistors operate more efficiently. This allows a processor to use less energy and generate less wasted heat. With SOI, Apollo can use a 0.18-micron fabrication process to break the 1GHz barrier and still meet the heat and power-consumption needs of customers who turn to Motorola for embedded processors.

Satisfying those customers is an important consideration for Motorola. While Apple is a large and important customer for the chip maker, Motorola sells far more G4s to customers in the embedded-processor market. So when Motorola builds a processor, it has to satisfy *all* of its G4 customers; Apple alone isn't large enough to drive

WHAT'S NEXT

On June 20, hardcore Mac programmers descend on Dearborn, Michigan, for the annual MacHack conference, where they discuss the language of Mac programming and show off hacks.

development (see "Stand by Your CPU," *Buzz*, August 2001).

SOI isn't a new technology—the idea has been kicking around since the 1970s. But applying SOI to a manufacturing process is tricky, and Motorola made some trade-offs to get it working at a level that makes money. The drawbacks are a larger processor-die size, which makes a processor more expensive, and the amount of time it takes to get SOI into the fabrication process.

"Going to 0.13 is just a process change for us," says Fehr, denying that Motorola will take much time to make its new SOI process smaller. "It's a relatively simple way to bump up speed and reduce cost."

"Everything from this family on will include SOI," says Eric Boles, Motorola's strategic communications program manager. "That's where the performance edge from Apollo came from."

Here Comes the Sun

What will moving to a 0.13-micron fabrication process mean for Apollo's future? *Microprocessor Report* predicts that Apollo could reach a clock speed of 1.3GHz, based on the performance of the 0.18-micron 1GHz chip.

Motorola declines to comment on that prediction. But Boles will say that Motorola plans to keep focusing on the G4, and that any computing-space G5 is still a long way off. "We're going ahead on G4, and we've got room to move," Boles adds.

The G5, Motorola's next-generation PowerPC processor, has already debuted in the embedded-processor market. It boasts many of the same features as the G4—such as SOI and a 0.13-micron manufacturing process. But it also includes a revised pipeline and RapidIO—a new high-speed method for integrating a processor and a system. Motorola's PowerPC road map also includes 64-bit datapaths that are backward compatible with the 32-bit datapath of the G3 and G4. While these features may make Mac gearheads salivate, improvements are unlikely to arrive while the Apollo has room to grow.

Don't look for the Apollo chip to eclipse the likes of the Pentium or AMD's Athlon CPU. But we can expect the gap between the PowerPC and its rivals to at least close this year—meaning that bright days could be ahead for the Mac, thanks to Apollo.—DAVID READ

THE LATEST DIGITAL CAMERAS

In Focus

Don't look for digital-camera makers to dwell on the blahs that are affecting the rest of the computer industry. They're too busy churning out cameras for all types of users—from inexpensive, entry-level models to 6-megapixel single-lens reflex (SLR)

cameras designed for advanced amateurs with thick wallets (also known as prosumers). In recent months, three companies with strong film-camera backgrounds—Canon, Nikon, and Leica—have unveiled new products, which are now appearing on retailers' shelves.

Canon (800/652-2666, www.usa.canon.com) has introduced the EOS D60 (see "Product Watch," *Mac Beat*, May 2002), a \$1,999 6.3-megapixel digital SLR camera that succeeds the company's highly successful 3-megapixel D30. The D60 accepts



The Canon EOS D60

any Canon EOS lens, so it's ideal for amateur and professional photographers.

With the D100, Nikon (800/645-6687, www.nikonusa.com) has finally entered the prosumer space. The 6.1-megapixel SLR camera, which can use any compatible Nikkor lens, has an estimated street price of \$1,999. It should be available this summer.

Nikon has also announced the Coolpix 2500 (see "Product Watch," *Mac Beat*, May 2002), a 2-megapixel pocket-size camera with a unique inner-swivel lens and a 3× optical zoom.



The Nikon Coolpix 2500

2500 (\$380), a 2-megapixel pocket-size camera with a unique inner-swivel lens and a 3× optical zoom.

Leica (800/222-0118, www.leica-camera.com), the company that pioneered the 35mm camera back in 1924, has announced the Digilux 1, a 4-megapixel camera priced at \$999. This camera has a 3× optical zoom, a large 2.5-inch LCD display on its back, a hot shoe for an external flash, a 64MB Secure Digital memory card, and a three-hour lithium-ion rechargeable battery.—RICK LEPAGE

PANTONE COLORS—TO GO

Color Coordinated

You never know when or where you're going to stumble across the perfect color for a project. Unfortunately, you also don't know whether you'll be able to re-create that color from memory once you're back in the office and poring over swatch books for the right color code. For designers who want to avoid the color-identification blues, Pantone (866/726-8663, www.pantone.com) offers the



Pantone Color Cue. Just 6 inches long, 1.6 inches wide, and 1.5 inches tall, and weighing in at 3.4 ounces, the portable spectrophotometer is about the size of a miniflashlight. Place it over any color that catches your eye and then press a button, and the Color Cue instantly displays on its LED screen the closest number from the Pantone Matching System color standard. The Color Cue also lets you scroll through other information about the color, such as Pantone Color ink formulas and CMYK, RGB, sRGB, HTML, Lab, and Hexachrome values. Available in gunmetal gray—that's Pantone 430 C in color-code talk—the Color Cue sells for \$349, less expensive than larger spectrophotometers. A \$399 version comes with the *Pantone Solid in RGB Guide*, providing a handy visual reference that will make finding the right color less of a gray area.—PHILIP MICHAELS

MACS AT WORK

Strength in Numbers

Dean Dauger wanted to know what kind of performance you'd get if you hooked up a lab full of Macs to make a computer cluster. More than idle speculation prompted his question: Dauger is the founder of Dauger Research, which aims to make high-performance computing accessible and easy to use. One way to do that is through computer clustering, which can help small labs with limited budgets amass considerable computational power by linking computers so they act as a single system. Clustering can also benefit computation-intensive tasks such as video editing, 3-D rendering, and special-effects creation.

So last winter, with the help of researchers and staff at the University of Southern California, Dauger and UCLA research physicist and adjunct professor Viktor Decyk hooked up 56 dual-533MHz Power Mac G4s and 20 dual-450MHz G4s, at USC's Language Arts computer lab, to test the scalability of a Mac cluster. The largest cluster Dauger and Decyk had previously tested consisted of 16 Macs.

The results of the 76-Mac experiment? Software running on the cluster achieved 233 gigaflops, a measure of computer speed that tallies floating-point operations per second. "I believe we found that reusing a large Mac lab as a computing cluster was a viable possibility," Dauger says.

They ran the experiment on Mac OS 9.2.1 to avoid the hassle of installing OS X on 76 machines. Since the software used in the test runs on both versions of Mac OS, Dauger thinks the results would have been about the same on OS X. "It doesn't matter; it just works," he says. "I think that's the way it should be, and it demonstrates a really great thing unique to the Mac." —PHILIP MICHAELS

WORKING
MACS

Do you know any interesting stories about Macs in the workplace? Send your tale to Macworld's Philip Michaels, at pmichaels@macworld.com.

DIGITAL PHOTO TOOLS

Media Savvy

Before you can enjoy prints of your digital photos (see "Turn Pixels into Prints," elsewhere in this issue), you need to get images from your camera to your Mac. Media readers offer some help, allowing you to transfer files from a CompactFlash or SmartMedia card instead of forcing you to lug around a USB cable and your digital camera. Now media readers are providing flexibility, with the ability to read and write in more formats than a United Nations translator. Addonics Technologies, Imation, Keyspan, LaCie, SCM Microsystems, and Y-E Data sell media readers that can accept six different types of media—ideal in offices where many users transfer images from digital cameras that support varying formats. It's another way to keep Apple's digital hub connected to its many spokes. —PHILIP MICHAELS



Avid Readers

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Belkin	USB Dual Media Reader/Writer	\$60	800/223-5546, www.belkin.com	CompactFlash, SmartMedia
California Drives	Combo Card Reader	\$39	sales@caldrives.com , www.caldrives.com	CompactFlash, SmartMedia, Microdrive
Imation	FlashGo	\$70	888/466-3456, www.imation.com	CompactFlash, SmartMedia, Memory Stick, Microdrive, MMC, SD
Keyspan	USB Media Reader	\$49	510/222-0131, www.keyspan.com	CompactFlash, SmartMedia, Memory Stick, Microdrive, MMC, SD
LaCie	Hexa Media Drive	\$60	503/844-4500, www.lacie.com	CompactFlash, SmartMedia, Memory Stick, Microdrive, MMC, SD
SCM Microsystems	Dazzle 6-in-1 Reader	\$50	888/212-8045, www.dazzle.com	CompactFlash, SmartMedia, Memory Stick, Microdrive, MMC, SD
SmartDisk Reader	Dual Media	\$40	941/436-2500, www.smartdisk.com	CompactFlash, SmartMedia
Y-E Data Drive	Hexa Media	\$49	847/887-7540, www.yedata.com	CompactFlash, SmartMedia, Memory Stick, Microdrive, MMC, SD



CARLA THOMAS/NASA DRYDEN

Soaring to New Heights

AeroVironment uses computers to help its unmanned Helios Prototype aircraft fly 18 miles above the earth, so the last thing it wants is a machine that crashes. No wonder, then, that the company, based in Monrovia, California, turned to Power Mac 6100s and 7200s to display the plane's instruments and record flight data.

"It has to run without bugs. . . . we need reliability," says AeroVironment's vice president Bob Curtin.

Those Macs help keep aloft a 1,500-pound aircraft that's 7 feet long from nose to tail and has a 250-foot wingspan with 14 propellers—described by Curtin as "basically a long, skinny wing." AeroVironment wants to build unmanned aircraft that can stay at high altitudes for prolonged periods to serve as low-flying satellites—the equivalent of 18-mile-high towers that will offer services such as broadband wireless transmission more efficiently than orbiting satellites. In an August 2001 test conducted with NASA, the Helios reached an altitude of 96,863 feet; only rocket-propelled craft have gone higher. —PHILIP MICHAELS

OFFICE MATES

Once Apple's fiercest rival, Microsoft has emerged as one of Apple's model developers during the past five years. Part of the credit for the improved relationship between the two companies goes to the efforts of Microsoft's Mac Business Unit, headed by 11-year Microsoft veteran Kevin Browne. *Macworld* recently spoke to Browne about the Mac Business Unit and what to expect from the group in the future.—PHILIP MICHAELS



AT A GLANCE

KEVIN BROWNE

Mac Business Unit GM, Microsoft

MAC: 400MHz Titanium PowerBook G4

SOFTWARE: Adobe Photoshop Elements, Blizzard Diablo II

How has the Mac Business Unit's focus evolved in the five years since it was formed?

We started as a team to port one version of Office to the Mac. This was in January 1997, before the [Apple-Microsoft] agreement [in August 1997], before Apple turned it around. We still focus heavily on Office, but we've also expanded our scope to include Internet products that are important to customers. We also decided that we weren't going to just port products; we wanted to understand the Mac customer's needs, and make the right products for them. We prioritize feature investments differently. There has also been a huge amount of turnover in our staff, and I think we're a stronger group than we've ever been.

The Apple-Microsoft pact expires in August. What will that mean for future dealings with Apple?

Microsoft will continue the Mac business after August, and we intend to continue it on all the same terms that we've pursued in the past. The technology agreement that we signed with Apple does not drive today nor has it ever driven Microsoft support for the Mac. We got into this business before we signed the technology agreement with Apple, and we'll continue doing the business after because we've said we've got to approach the business like a business and do the right things for our customers.

How does OS X figure into your future plans?

We were among the earliest and most vocal supporters of OS X, even when there wasn't necessary software out there that you could point to and say, "This is why we believe." We're betting the whole business on OS X. We're committing to doing our work only on OS X across our product line. We won't do another major release of any of our products on OS 8 and 9. So if Apple fails with OS X, so do we. We go down the drain, too. Hopefully people can take that as commitment, rather than a signed agreement.

More Info:

www.macworld.com/2002/06/macbeat/browne.html

In *Macworld*'s online interview, Kevin Browne talks about the first Mac he ever used and Microsoft's work on Office v. X.

True Blue

Bluetooth has found a friend in Cupertino. Apple (800/692-7753, www.apple.com) is adding support for the wireless connectivity standard, named after a medieval Danish king, to Mac OS X. Apple's preview software, available as a free download, lets your Mac wirelessly connect to Bluetooth-compatible cell phones, PDAs, and other devices. The software should work with any USB adapter compliant with Apple's Bluetooth stack, but the company is teaming up with D-Link (949/788-0805, www.dlink.com) to produce the \$49 Mac-compatible DWB-120M Bluetooth USB adapter. Other companies embraced Bluetooth more than three years ago; why did Apple wait to support the short-range wireless-networking protocol? "What was important was to be early but not so early that it wouldn't make sense for our customers," says Greg Joswiak, senior director of hardware product marketing. Bluetooth-enabled PDAs are now available, and cellular phones are starting to support the standard. By producing software now, says Mike Bell, vice president of software engineering, Apple hopes to provide developers with a single Bluetooth spec, pushing wider adoption of the standard. "We want [companies] producing Bluetooth devices to test them with Macs first," Bell adds.—PHILIP MICHAELS

Motion Pictures

If you watch a Ken Burns documentary, you can't miss the scenes in which a camera slowly pans across a photo of the Brooklyn Dodgers or zooms in on an image from the 19th century. Creating shots like these usually requires expensive hardware. But the \$199 MovingPicture, from StageTools (www.stagetools.com), can give you the same effects. The Moving-



On the Move StageTools' MovingPicture creates pan and zoom effects for still images.

Picture plug-in works with many nonlinear editors—including Adobe Premiere and After Effects, Apple's Final Cut Pro, and Media 100 systems—while letting you work with high-resolution scans directly from your timeline. Recently updated to version 3.0, MovingPicture adds motion blur, timeline scrubbing, multiple-image Flash output, and OS X compatibility. StageTools also offers the \$199 MovingPicture Producer, a stand-alone program that's ideal if you use an unsupported editor or don't want to tie up your high-priced editing station. The nonrendering version—which lets you create motion paths on almost any computer and then render them on your registered system—is free. Just because your video relies on still images doesn't mean that you can't add a little action to the final cut.—JONATHAN SEFF

BEHIND THE HIGHER iMAC COST

The Price Is Right?

If you're thinking of buying Apple's redesigned iMac, the good news is that you won't have to wait as long as some of the first purchasers to get your hands on the G4-powered, flat-panel computer. The bad news? You'll pay \$100 more than they did.

Apple says that it's now shipping 5,000 iMacs a day—enough to catch up with orders backlogged from January by the time you read this. In addition to the normal challenge of ramping up production on a new computer, Apple had to deal with more pre-orders than it'd had for any other Mac, says Greg Joswiak, senior director of hardware product marketing.

At the same time, higher costs for flat-panel displays and memory forced the company to raise prices by \$100 for all three iMac configurations (Apple is honoring existing orders at their original price). Since the iMac's January introduction, Joswiak says, flat-panel prices have risen 25 per-

cent while the cost of memory has tripled. "It's not a surprise they've increased," he adds. "It's a surprise they're increasing so quickly."

Blame the rising cost of computer parts on "good ol' supply and demand," says Bob O'Donnell, research director for device technology at technology forecast firm IDC. With flat-panel displays, for instance, prices fell dramatically in the last few years, causing a jump in demand. But at

the same time, supplies remained flat, causing prices to spike upward since last fall.

"Apple is also hit by the fact that it's not buying on the scale of a Dell, so it's not able to protect itself," says Jupiter Media Matrix research director Michael Gartenberg.

To adjust for the higher costs without raising prices, some PC makers are scaling back on features such as memory and storage capacity, masking those changes by increasing processor speed. That wasn't an option for Apple. "If we were to deconfigure, you would know what we were doing," Joswiak said. Instead, Apple figured a \$100 price hike would be the most painless way to deal with higher costs.

Will that turn out to be true? Consumers are generally turned off by price increases, but analysts say that the iMac is a unique product. "If people are willing to pay \$1,800 [for a top-of-the-line iMac], they'll pay \$1,900," Gartenberg says. "You're still getting a very good value, even for the additional \$100 you're paying."—PHILIP MICHAELS



PRODUCT WATCH

JUNE 2002

Frame by Frame

Recent Adobe releases (800/833-6687, www.adobe.com) have reflected the company's interest in network publishing; Adobe wants to make it easy to simultaneously publish in multiple formats, such as print, the Web, and handheld devices. FrameMaker 7.0, the latest version of Adobe's publishing software for books and technical documents, is no exception, with new features including a wider range of output options, improved XML support, and better collaboration tools for sharing files across a network.

The previous version of FrameMaker came in two flavors—the \$799 standard edition and a \$1,449 FrameMaker+SGML edition, which let designers create complex, structured documents using Standard Generalized Markup Language and—to a lesser extent—XML. FrameMaker 7.0 combines both editions in one \$799 package. Among FrameMaker's XML improvements is the ability to import, validate, and export XML files and document type definitions (DTDs)—rules that define the structure and validity of your XML. At the same time, you can now edit content in a WYSIWYG environment.

If you need to export your document as a PDF, you can use FrameMaker 7.0 to create Tagged PDF files, which allow content to reflow to fit a variety of screen sizes. Smaller improvements include greater flexibility in using Master pages; support for importing PDF 1.4, Scalable Vector Graphics (SVG), and native Adobe Illustrator files (version 9 and higher); and better file sharing with support for the WebDAV protocol.

One thing you won't find in the new FrameMaker, which should hit retail shelves by early June, is native OS X support. The updated version runs in OS 9, but it won't run natively in Apple's new OS.—KELLY LUNSFORD

Hardware



Displays

A 23-inch LCD monitor from Apple (800/692-7753, www.apple.com):

The Apple Cinema HD

Display (\$3,499) is an all-digital flat-panel display that offers 1,920-by-1,200-pixel resolution. It supports 16.7 million colors, offers a 160-degree viewing angle, and features a 16:10 aspect ratio, allowing users to view a full 11-by-17-inch two-page spread.

MP3 Players

A higher-capacity iPod from Apple: In addition to its \$399 5GB MP3 player, Apple has introduced a 10GB iPod (\$499), which it says can store 2,000 CD-quality songs. Apple will also offer \$49 laser engraving so users can personalize their iPods with two lines of text (with as many as 27 characters per line).

Printers

Five ink-jet printers from Lexmark (888/539-6275, www.lexmark.com): The Lexmark Z65 (\$199) features 4,800-by-600-dpi resolution and prints at speeds of 15 pages per minute in color and 21 pages per minute in black-and-white. The Lexmark Z55 (\$129) offers 3,600-by-600-dpi resolution and print speeds of 13 pages per minute in color and 17 pages per minute in black-and-white. The Lexmark Z45 (\$89) features 2,400-by-1,200-dpi resolution and print speeds of 9 pages per minute in color and 15 pages per minute in black-and-white. The Lexmark Z35 (\$69) features the same resolution but prints 6 pages per minute in color and 11 pages per minute in black-and-white. The Lexmark Z25 (\$49) features 1,200-by-1,200-dpi resolution and print speeds of 6 pages per minute in color and 9 pages per minute in black-and-white.

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WHAT'S HOT

A Quick Look at the World of Tech

1. Apple's latest iPod doubles the MP3 player's storage capacity. Ironically, with its 10GB capacity, the iPod can now hold more music than Napster.
2. Apple announces support for Bluetooth, a technology that will let cell phones, PDAs, and other devices connect wirelessly to your Mac. However, the technology will do nothing to make elaborate cell-phone rings less annoying.
3. Rising component costs force Apple to raise the prices of all three new flat-panel iMac configurations by \$100. Look on the bright side—that's only, like, \$48 Canadian.
4. Hewlett-Packard and Compaq shareholders approve the merger of the two companies. Executives of HP and Compaq crow, "Now we can focus on what our companies do best—building computers that no one cares about."

Storage Devices

A tape backup system from Exabyte (800/392-2983, www.exabyte.com): The VXA AutoPak 1x10 (\$2,995) contains one VXA-1 tape drive and ten VXA tape cartridges. It can store as much as 660GB of compressed data.

A line of portable hard drives from Iomega (888/446-6342, www.iomega.com): The Iomega Portable Hard Drive has a FireWire interface and is available with a capacity of 20GB (\$229) or 30GB (\$279). There's also a USB 2.0 drive (\$199 and \$259) that's backward compatible with USB 1.1 on the Mac.

System Hardware

Processor upgrade cards from Sonnet Technologies (949/587-3500, www.sonnettech.com): The Harmoni G3 600MHz FireWire and processor-upgrade card (\$400)—the second member of the Harmoni family of CRT iMac upgrades—features a 600MHz IBM PowerPC G3 processor with 256K of Level 2 cache. It's for 233MHz, 266MHz, and 333MHz iMacs. The Crescendo/PB G3 466-1M (\$300) is a processor upgrade for the PowerBook 1400; it offers a 466MHz PowerPC G3 CPU with 1MB of Level 2 backside cache.

Software



Cross-Platform

Celview 3.0, from Celcorp (780/438-2323, www.celview.com):

The latest version of the terminal-emulation product is the first 5250/3270 emulator to run on OS X; it also supports Mac OS 8.1 and later (\$295 for AS/400 or Mainframe edition; \$175 for Celview SNA Gateway; upgrades, \$79).

Science Software

SPSS 11.0, from SPSS (800/543-2185, www.spss.com): The data-analysis software now runs on OS X. It adds linear mixed

models for accurate predictive models when working with nested data. SPSS 11.0, which will ship in the third quarter of 2002, also features enhanced statistical procedures and data management (\$999 for commercial users; \$599 for academic users; upgrade pricing not available at press time).

Utility Software

File Buddy 7.0, from SkyTag Software (919/933-9595, www.skytag.com): The file-management utility runs on OS 9 and higher, including OS X. It features support for long file names and name extensions, as well as other enhancements (\$50; upgrade, \$20).

Palm Desktop 4.0, from Palm (800/881-7256, www.palm.com): The PDA syncing software now has OS X support, as well as support for vCard and vCal files for sharing information with Microsoft Entourage X, OS X Address Book, and Palm Desktop for Windows (free).

Announced



Acquisition

The purchase of Zayante (831/461-4900, www.zayante.com) by Apple: Zayante makes IEEE-1394

silicon and software used by computer-product and semiconductor manufacturers to produce FireWire-compliant products. Apple says that the purchase extends the company's commitment to the high-speed connectivity standard.

New Price

A price cut for 3-D-animation software by Alias|Wavefront (800/447-2542, www.aliaswavefront.com): The price of Maya Complete, which runs on OS X, has dropped to \$1,999 from \$7,500. The price cut follows the release earlier this year of a free downloadable version of Maya called Maya Personal Learning Edition.

—COMPILED BY PHILIP MICHAELS

Mac OS X Updates

powered by



Adobe Illustrator 10.0.1

Speeds up launch time, copying and pasting, and opening and saving files

Apple iPod 1.1

Adds contacts menu and new equalizer to MP3 player

Apple iTunes X 2.0.4

Expands AppleScript support

AudioX 1.0

Tool records sound from any input source

Bias Peak DV 3.0r3

Digital-audio-editing software

Blizzard Diablo II X 1.0.9d

Patch for OS X compatibility

Bookends X 7.0

Bibliography and reference-management system

Canon ScanGear CS-U 6.2

Drivers for CanoScan N670U, N676U, and N1240U

Cocoa eFax 0.9.4

Fax software

Desktop Rebuilder 1.0

Rebuilds OS X desktop files

Epson Scan to File 1.0

Beta drivers for Epson Perfection and Expression scanners

FWB SubRosa 1.0.1

Encryption and shredding tools for data protection

HP DeskJet 1.3

OS X printer drivers for most HP models

IPNetMonitor X 0.9b1

Monitors and troubleshoots Internet connections

Kensington Mouse Works 1.1r4

Driver software for USB or ADB mice and trackballs

KidsGoGoGo X 5.3

Parental-control Web-filter application

MacVCD X 4.0.2

Full-screen VCD player

Mailsmith 1.5

E-mail client

Netscape X 6.2.2

Improves Web browser's autocomplete and downloading functions

Panopticon Tools 1.1

After Effects plug-ins

Rumpus 2.1

FTP server software

Speed Download 1.8fc5

Download accelerator

StarfishMonkey 1.0

Antispam software

Traffic Report X 1.1.3

Web-server statistical- and marketing-log analysis

VST FireWire Disk Encryption 1.0.1

Security tool for the external hard drive

Wacom Tablet 4.72-5

Driver for USB tablets

Watson 1.5

Adds four new tools to desktop Web-services app

For these and other current updates, visit:

www.macworld.com/subject/updates

ACCESSORIZING YOUR IPOD

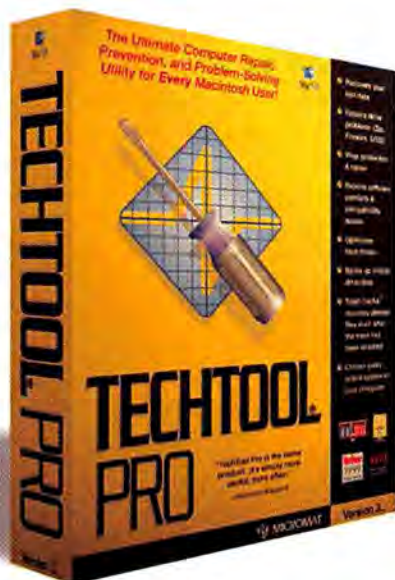
Do Touch That Dial

One of the iPod's greatest advantages is this portable music player's ability to store a vast catalog composed entirely of your favorite tunes. But what if you want to share your music library with other people in a car or at your house? You have two options: tote around a rat's nest of adapter cables or pick up an adapter such as the iRock 300W, from First International Digital (847/202-1900, www.myirock.com). To combine the wonders of an iPod's playlist with the capabilities of a stereo, all you have to do is plug the iRock into your iPod, select one of four frequencies, and tune your radio to that frequency. Like the iPod, the iRock is compact, measuring 2 by 3 inches. Unlike the \$399 iPod, the iRock 300W can be had for the price of a couple CDs—\$30. For a few dollars more, you can get the iPod Connection Kit, from Dr. Bott (877/611-2688, www.drbot.com). This \$50 kit includes a wireless FM transmitter and a recharger for your iPod—enough to guarantee you'll be able to share your tunes with anyone in earshot.—LISA SCHMEISER



In with the new...

In with the newer...



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

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

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

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



Micromat Inc.

800-829-6227

707-566-3831

info@micromat.com

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ADOBE GOLIVE 6.0

Web-Site-Management Software Provides Heavy-Duty Features, Approaches Parity with Competitors

BY GLENN FLEISHMAN

It used to be that Adobe GoLive was a strong second to Macromedia Dreamweaver—it was a prettier way to hand-code Web pages. But with version 6.0, GoLive has matured from a program with strong potential but a somewhat incomplete feature set into a powerhouse server suite and workgroup-integration tool that validates HTML code and lets you serve database content relatively easily—and does it all at a nice price.

Like Adobe's other recently released products, GoLive 6.0 works natively in both OS 9 and OS X, and it requires only a single installation. GoLive 6.0 running in OS X is not much faster than GoLive 5.0 running in OS 9, and GoLive 6.0 runs slightly slower in OS X than in OS 9 on the same machine. But this version is very reliable in OS X, especially compared with

GoLive 5.0's sometimes flaky performance in OS 9.

Showing Its Face

Although Adobe has brought GoLive to OS X, it has left the interface almost untouched. GoLive 6.0 does have more palettes, which offer more contextual settings and advice for users, but you'll still find vestiges of old interface quirks. To preview the contents of frames, for example, you have to click on a VCR-style display with square buttons that control stopping and playing. Nothing else in the program looks like this, and there's no good reason to confuse users with an inconsistent approach.

One Page at a Time

As it has since its inception, GoLive lets you build a page by dragging graphical elements (which are categorized by type—basic, forms, head, frames, and

so on) from the Objects palette or by typing directly on a page. GoLive 6.0's page-design features have been only incrementally improved.

One notable improvement is version 6.0's updated Tables palette, which displays exact pixel dimensions; in previous versions, you had to examine each cell in a row and add padding and spacing to create an absolute pixel measurement for a table's width.

Disappointing JavaScript

Several versions ago, GoLive introduced interface-driven JavaScript and DHTML, which it calls GoLive Actions. These Actions are ordinary yet difficult-to-write activities for which GoLive includes standard code libraries, as well as a friendly palette that hides the complexity of the code. Adobe includes more than 80 Actions in GoLive 6.0.

But support for JavaScript has not been improved: GoLive has a JavaScript text editor, but if you have problems with your code, you're on your own. A long-unresolved, incomplete feature shows all links on a page as "links[?]." This means that you have to edit source code to insert link triggers such as clicks and mouseovers.

Are You Good HTML or Bad HTML?

A major complaint in our review of GoLive 5.0 (★★★★; *Reviews*, December 2000) concerned the program's inability to write pages that passed the World Wide Web Consortium (W3C) validation test, which checks for well-written HTML that browsers can interpret without a hitch. Since that review, Adobe has revamped both the writing and checking of code in GoLive. An expanded Syntax Checker lets you check a page's code against several major standards, and it produces a clickable report of errors.

Powerful Site Maps

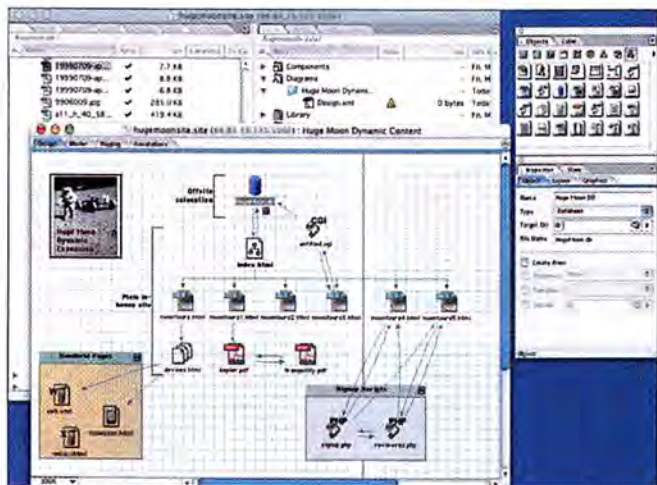
One of GoLive's strengths is site organization and maintenance. The program organizes a site's pages and media files into a graphical site window, and dragging files into or out of folders that correspond to the pages rewrites all the links to them and within them. A variety of site features extend this approach: an Errors tab that shows problems with site links and missing files; FTP and WebDAV (Web Distributed Authoring and Versioning) tabs for incremental or full site synchronization with remote servers; and an Extras tab containing two kinds of templates, one with locked areas and one that's fully editable.

The Design feature, redubbed Diagrams in version 6.0, was one of GoLive 5.0's most helpful. It let you use a large grid to prototype new sites, or parts of existing sites, by creating relationships between icon representations of the site's parts. The Diagrams feature includes custom icons representing different file types, as well as more-sophisticated output controls that let you turn your prototypes into clickable PDF and SVG (Scalable Vector Graphics) files that can be opened in Web browsers.

All Together Now

It may be hard to get excited about file transfers, but the implementation of WebDAV will make you jump for joy. WebDAV not only lets you check your files in and out of a server, but also exchanges information about the files. The power here is that a server can coordinate many users editing the same files, as well as track revisions of files over time.

GoLive 6.0 continues to expand upon the miracle of WebDAV by including the Adobe Web Workgroup Server (AWWS), which allows a group



Get Organized GoLive 6.0's revised Diagrams feature employs icons and a grid to help you create site maps. The icons placed on the grid correspond to real files, which can be edited and then copied to a live site.

- 30 **Web-site-design software**
Adobe GoLive 6.0
- 31 **OCR applications**
FineReader Pro 5,
OmniPage Pro X
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Miglia Alchemy ATA-133 RAID PCI,
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Sonnet Technologies Tempo
RAID133
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Cinema 4D XL 7.3
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RealMyst,
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- 70 **Ink-jet photo printers**
Canon S820D,
Canon S900,
Epson Stylus Photo 785EPX,
Epson Stylus Photo 820,
Hewlett-Packard Photosmart 1315

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

of users (or even an individual) to store all the files associated with a GoLive site on a server and check them in and out for editing. And not just Adobe software is compatible with the AWWWS—other WebDAV-enabled software, such as Goliath and Dreamweaver 4, can access it too.

GoLive 6.0 also brings intraprogram connections to a whole new plane by supporting Adobe's latest technology: Variables. Variables let you set particular layers, objects, or text in Illustrator 10, Photoshop 7.0, and LiveMotion 2.0, so that GoLive can modify them.

Commanding Data

Let's say you have a catalog of 500 widgets, with part numbers, pictures, descriptions, and prices. GoLive lets you take database content and, using a graphical tool that creates templates for these various widget fields, feed it to your Web site. To do this, Adobe dramatically improved GoLive 5.0's Dynamic Link technology, which attempted to replicate Macromedia's UltraDev database features. Now called Dynamic Content, with icons as placeholders for database content, it lets any designer or Web producer build dynamic pages, but the overly complex initial setup and poor documentation don't make this as easy as it should be.

Adobe includes an excellent extra to help jump-start database use: a package called GoLive Preconfigured Servers, which includes the Apache Web server already set up to work with PHP; the Tomcat JSP server; and the MySQL database server. Granted, this software is all available separately—for free—from open-source developers, but Adobe is supplying it already configured in a single package that installs in Mac OS X 10.1 or Windows XP and 2000. It's hard

to beat a product that's both free and well put together.

Technical Support

GoLive comes with 90 days of tech support activated by the first call—not enough given the difficulty of this program but similar to what competitors offer. When the 90-day period runs out, the Web-based Adobe Forums offer limited, free technical support through posted messages; other users often answer questions, and Adobe personnel frequently respond within minutes.

Macworld's Buying Advice

With version 6.0, this former challenger to incumbent Dreamweaver 4 is now a near equal, and we'll have to wait and see how it stacks up against the nearly ready Dreamweaver MX. GoLive's database-integration support alone is worth the price of the program, and the powerful Adobe Web Workgroup Server makes GoLive suitable for workgroups.

Although it lacks JavaScript debugging tools and has its interface quirks, GoLive 6.0 delivers a top-notch approach to hundreds of page-design and Web-site tasks. □

RATING: ★★★★★

PROS: Some oddities in previous releases fixed; database and workgroup-server software and support; improved graphical site prototyping.

CONS: No JavaScript debugging tools; some longtime leftover interface quirks; complex database-integration setup with poor documentation.

PRICE: \$399; upgrade from previous versions of GoLive and PageMill, \$99
OS COMPATIBILITY: Mac OS 9, Mac OS X

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

OPTICAL CHARACTER RECOGNITION APPLICATIONS

FineReader Pro 5 and OmniPage Pro X Get the Job Done—with Your Help

BY CHRISTOPHER BREEN

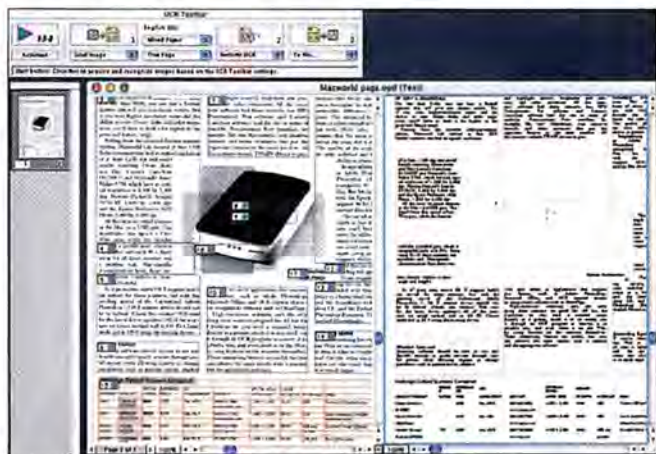
Converting a printed page into accurate and editable text has long been one of the great challenges facing computer users. Advances have been made over the years, but the current professional optical character recognition (OCR) applications for the Mac—Abbyy's FineReader Pro 5 and ScanSoft's OmniPage Pro X—demonstrate that turning paper into pixels remains an imperfect process.

The Basics

Both of these programs handle the basics: they accommodate any TWAIN-compliant scanner in Mac OS 9.2 and earlier, they let you fine-tune the OCR process by designating areas of text, graphics, and tables in a document, and they let you save files in a variety of formats. And on the surface, FineReader and OmniPage are very similar. Both

programs present a main window containing two panes—an image of the original scan is on the left, and the software-recognized text is on the right. The program imposes zones—boxes that denote a page's text, tables, and graphic elements—on the scanned image. The software can render these zones automatically, or you can use the included tools to map out the zones yourself (see "Recognize Me?").

FineReader provides greater access to each step in the OCR process than OmniPage. For example, FineReader includes an Analyze Layout button, a feature missing from OmniPage. When you click on this button, FineReader quickly analyzes the document and maps out the zones. This is helpful if you want to change inappropriately recognized zones before letting the software scan the text. OmniPage's Perform OCR button cre-



Recognize Me? OmniPage Pro X detects most zones correctly in some complex documents. The recognized text is on the right, and the original scan is on the left.

ates zones and recognizes text in one step. Once those processes are complete, you can then change zone types and, if necessary, run the OCR process again.

The two programs have similar export options, allowing you to save recognized text and pictures in Rich Text Format (RTF), AppleWorks, Microsoft Word and Excel, PDF, and HTML. Although both programs allow you to "scan" files from standard formats such as TIFF, JPEG, and PICT, only OmniPage can import PDF files. OmniPage is also the only OS X-native option of the two, but because few scanners work with OS X, this is not currently a tremendous advantage.

Spelling Counts

Of the two programs, OmniPage has the better spelling-checker interface. Its Proofread OCR window lets you move easily through the spelling-checker process, thanks to Ignore and Change buttons activated with the return key. On the other hand, FineReader requires you to click on every button with the mouse and open and close a new window whenever you wish to add a new word to FineReader's dictionary.

This is an important difference, considering that you'll spend a lot of time using the spelling checker. If our tests are any indication, you'll spend more time in FineReader's spelling checker than in OmniPage's, as FineReader ques-

tioned more words than OmniPage and, of those flagged words, got more of them wrong.

Head to Head

To test the automatic-recognition capabilities of the program, we scanned two documents with a multifunction HP OfficeJet G85 in black-and-white at 300 dpi—settings designed to produce a clean scan (see "Midrange Flatbed Scanners," April 2002, for more on getting a good scan). The first document was a simple press release that contained a logo and a large block of text with some italic and bold-face words. The second was a *Macworld* page comprising small type, multiple columns, a large graphic, and a table. We set up the two programs to automatically create zones and recognize the pages. We ran them through the spelling checker and then exported the pages as RTF (opened and read in Word) and PDF files.

Simple Fare

For documents that have simple layouts, FineReader does an acceptable job. The program correctly identified the press release's logo as a graphic, put all the text except the contact information at the bottom in a single text block, and correctly identified the bold and italic text in the exported RTF and PDF file (though it underlined the bold headline).

To get similar results in OmniPage, we had to tell the

program that the page contained a single column (this is done via a pop-up menu located in the toolbar). Although the italic text appeared in the Word document, the only bold type that appeared in the RTF file was in the headline, and spaces between paragraphs were exaggerated. OmniPage incorrectly identified the logo as text—but it did correctly recognize that text. In the PDF file, OmniPage again failed to produce the bold formatting in the body of the press release and, in places where the bold formatting should have appeared, often dropped words below the baseline of the surrounding text.

Labyrinthine Layouts

With the more complex *Macworld* page, OmniPage outperformed FineReader. After we selected the Mixed Pages option in the toolbar, OmniPage created numerous text blocks. The exported OmniPage RTF file closely matched the layout of the original page, though it contained some odd line breaks and spaces and suffered from the same baseline problems. Even after we told FineReader that the page had multiple columns, it lumped a couple of parallel columns together in a single zone, causing the exported text in the RTF file to be jumbled.

PDF files created with the two programs were cleaner. Although FineReader correctly identified the graphic and included it in the PDF file, its overly broad selection of text blocks caused it to leave out lines where the zones bordered each other at the end of some paragraphs in the exported file. Both programs properly produced the magazine page's table, but where FineReader included a mixed set of font sizes, OmniPage produced more-consistent text formatting.

Manual Transmission

We were able to rectify many of these problems by manually adjusting the zones before having the programs analyze the documents. Both programs let you create rectangular and

polygonal zones, and they let you combine adjacent zones. Converting the text zone around the press release's logo to a graphic zone allowed OmniPage to correctly export the graphic. Likewise, drawing more zones on the magazine page improved the formatting of the RTF and PDF files exported from FineReader. But the fact that you have to resort to the manual tools calls into question the usefulness of the programs' batch-processing capabilities and support for scanners with sheet-feeder attachments—features designed to let you scan and convert multiple documents with little user interference.

Macworld's Buying Advice

Neither OmniPage Pro X nor FineReader Pro 5 is perfect. But OmniPage—with its power to more easily recognize complex documents automatically, ability to import PDF files, and cleaner spelling-checker interface—is closer to the mark, particularly if you plan on scanning a lot of documents that have complex layouts. □

FINEREADER PRO 5

RATING: ★★★

PROS: Admirably converts uncomplicated documents; timesaving Analyze Layout feature.

CONS: Clunky spelling checker; no PDF-import support; poorly handles automatic recognition of complex documents.

PRICE: \$129

OS COMPATIBILITY: Mac OS 9

COMPANY: Abbyy, 510/226-6717, www.abbyyusa.com

OMNIPAGE PRO X

RATING: ★★★★

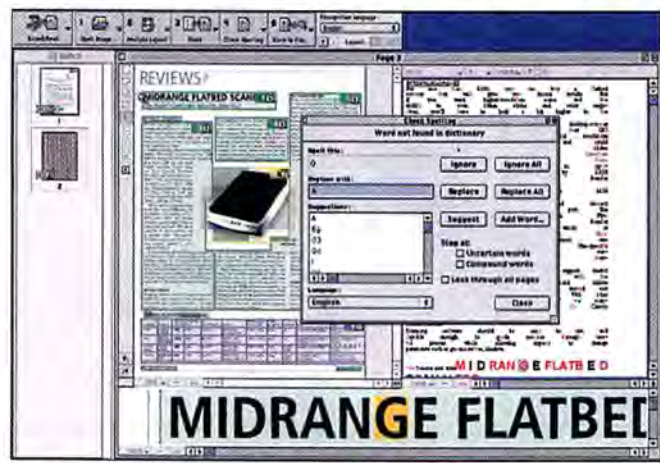
PROS: Flexible recognition options; imports PDF files; superior spelling-checker interface.

CONS: Exported files have line-break problems; lacks feature for analyzing layout; list price is inflated.

PRICE: \$499; upgrade from other OCR package, \$149

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: ScanSoft, 800/654-1187, www.scansoft.com



Checked Spelling FineReader Pro 5 is hampered by a clumsy spelling checker.

ATA/133 PCI RAID CARDS

Four Products That Let You Hook Up Fast, High-Capacity Storage, without a Lot of Clutter

BY KRISTINA DE NIKE

If the inside of your Mac is no more mysterious to you than the inside of your sock drawer, an internal hardware RAID (Redundant Array of Independent Disks) array may be the perfect way to add lots of very fast storage to your system or to upgrade your boot drive. And because two bare ATA hard drives are often much less expensive than one external FireWire or SCSI drive with twice the capacity, it makes sense to look into this option. Storage this fast is well suited to editing DV video, accessing large graphics files, or serving up Web pages. An internal array also prevents the clutter of external drives and their cables.

Our Willing Subjects

We tested four ATA PCI RAID cards that combine two ATA drives to create one large, fast volume using the latest, 133-Mbps version of ATA: Acard's AEC-6880M/ATA-133 RAID, Miglia's Alchemy ATA 133 RAID PCI, SIIG's UltraATA 133/100 RAID, and Sonnet Technologies' Tempo RAID133.

Each PCI card employs hardware made by Acard, which also sells its own card. As a result, the four cards looked and behaved exactly the same—the choice you make will come down to

price, the quality of the card's manual and technical support, and the length of its warranty.

Give RAID a Chance

These cards provide the easiest RAID configuration the Mac has ever seen. You simply use an ATA cable to connect an ATA drive to a port on the PCI card, use another ATA cable to connect a second ATA drive to the next port on the card, flip a switch on the card, and reboot. The PCI card then reports to the CPU that the drives are a single SCSI device and that they appear as one volume on your desktop. You can then use any Mac drive-formatting software that works with SCSI drives—including OS 9's Drive Setup and OS X's Disk Utility—to format the RAID array.

The PCI cards accomplish this feat by using RAID Level 0, which alternates the data stream between two or more drives. Since both drives can write data at the same time, a two-drive array has the potential to be twice as fast as a single drive. When we tested this theory, the speed improvements of using a single drive were closer to 25 percent than 100 percent, but we were able to capture uncompressed video to our array at 27 MBps, which we were not able to do with a single drive. How-



The SIIG UltraATA 133/100 RAID

ever, the catch with RAID arrays is that if either drive fails, you lose the data on *both* drives.

In a Dead Heat

Because all of these products use the same hardware, it's not surprising they turned in nearly identical performance results in our tests. The hardware RAID configurations of two 80GB drives were faster than a single 80GB drive by as much as 25 percent. The only exception was the Adobe Photoshop Save test, in which a single drive was slightly faster.

For comparison, we also switched the RAID card to Normal mode and used Mac OS X's Disk Utility to create a software array with the same drives (see "Advanced RAID"). In our Finder File Duplicate test, the software-based RAID was 60 percent slower than the hardware RAID and 30 percent slower than a single drive. This is because a software RAID array relies on the CPU to send a quick series of commands alternating between two drives. SCSI and FireWire software RAID arrays also experience a slowdown, but unlike ATA, these

technologies better handle concurrent data, softening the performance hit to a system. As a result, SCSI and FireWire software RAID arrays tend to perform faster than a single drive but slower than a hardware RAID.

If you plan on adding a single drive to your desktop Mac, you don't need to invest in an ATA PCI card at all—you can connect an additional drive to the ATA/66 internal bus that ships with modern Macs. We tested this configuration against the ATA/133 bus on the PCI cards, using Barracuda 80GB Ultra ATA/100 drives, from Seagate. To see whether the ATA/133 bus on the cards was faster than the ATA/66 bus built into current Power Macs, we configured our test drive as a slave and moved it to the Mac's internal bus, where the boot drive was also located. This configuration performed identically to the 80GB drive attached to the PCI cards. Not surprisingly, our single drive transferred data at no faster than 66 MBps.

Quality of Manuals

Each ATA PCI RAID card we tested included a useful manual

Four Cards of the Same Suit

	Mac 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
Acard AEC-6880M/ATA-133 RAID	0:19	1:33	1:22	0:51
Miglia Alchemy ATA 133 RAID PCI	0:19	1:36	1:21	0:52
SIIG UltraATA 133/100 RAID	0:19	1:34	1:26	0:51
Sonnet Tempo RAID133	0:19	1:34	1:20	0:51
single ATA drive	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 Power Mac dual-1GHz G4 with Mac OS X 10.1.3 installed and 512MB of RAM. We formatted our Seagate Barracuda drives with OS X's Disk Utility. The File Duplicate test was performed with a 400MB file. Macworld Lab's Photoshop Suite test runs a script of five tasks on a 50MB file in the Classic environment. Photoshop's memory partition was set to 32MB and History was set to Minimum. The Photoshop Save test was performed with a 400MB file. We booted into Mac OS 9, used Drive Setup to format the drives, and then used Norton Speed Disk to optimize 700MB of data on the test drive. —MACWORLD LAB TESTING BY KRISTINA DE NIKE

If you're looking to get into RAID, here's some further information you might find helpful.

Software or Hardware RAID?

Anyone who wants to create a RAID array should know that there are two methods: using the hardware configuration the ATA PCI RAID cards provide, or using RAID software, such as SoftRAID's SoftRAID, Intech's Hard Disk SpeedTools, or Apple's Disk Utility in Mac OS X. In a hardware RAID, the data moves in a single stream from the CPU to the PCI card, which splits the data into alternating stripes. In a software array, the software splits the data stream, and the CPU alternates data traveling to and from the individual drives. Although hardware RAID cards are more expensive than software RAID packages, they are often faster, because a software array taxes your CPU much more heavily. Another advantage of a hardware array is that you can boot your system from it. We were able to boot both OS 9 and OS X from each of our hardware arrays.

Advanced RAID: Two Arrays Are Not Twice as Good

If one array isn't enough, you can attach another two drives to the other port on the PCI RAID card and create another hardware array. To make this work, you have to identify one of the two-drive arrays as the master and one as the slave. You must first set the jumpers, which are about the size of a grain of rice and fit over the pins on the drive (they're usually found between the drive's power plug and the ATA connector on the drive)—we recommend using tweezers.

Although you can connect two master drives and two slave drives to the cards to create two RAID Level 0 arrays, the addition of the slave array will negatively affect performance. The fastest configuration is two master drives of the same size and speed. If you use two drives of different capacities, your array will be only twice the size of the smaller drive.

Waiting for the Bus

If you currently have a drive connected to your Mac's original internal bus, it will not automatically mount on your desktop if you reconnect the drive to the ATA/133 RAID card. To remedy this, you can update the ATA drive's drivers with a formatting package such as FWB Software's Hard Disk ToolKit or Intech's Hard Disk SpeedTools. You can also make the drive visible by reinitializing the hard drive, but any data on the drive will be wiped out. Drives formatted with Mac OS X's Disk Utility can be moved from the internal ATA bus to the ATA card without this problem.

Getting Back to Normal

For troubleshooting your RAID array of drives, there is a small switch on the PCI card that lets the two drives operate in Normal mode, so the individual drives appear as themselves, letting you scan or repair them independently of one another with a disk utility but not retrieve data or boot from the drives. If you plan to use the drives separately on an ongoing basis, you'll want an ATA/133 card that does not have RAID capabilities: each company featured in this review also sells less expensive non-RAID ATA cards.

with instructions on how to install and configure the card. The documentation also covered initializing the drives in both OS 9 and OS X.

However, the hardest part of setting up an internal array is physically installing the internal drives in your computer. Miglia and Sonnet do a good job of explaining how to configure a drive as a master or slave with jumpers. The Acard and Sonnet manuals have useful and clear diagrams showing how to attach the master drive to the end of the ATA cable. Because using an ATA card is an economical way to replace an older SCSI drive, Miglia goes so far as to include illustrations on how to install a single drive in a range of pre-G3 Power Macs, beige G3s, and blue-and-white G3s. Miglia also includes instructions in French, Spanish, Italian, and German.

The Acard Web site has a list of supported drives from Seagate, Quantum, Maxtor, Fujitsu, IBM and Western Digital. These are the drives Acard has tested, but these are not necessarily the only drives that will work with the cards. Both Sonnet and SIIG confirm that they have been able to use the card with a variety of drives, including ATA/133 drives and older ATA/33 drives.

Technical Support

Each vendor hopes to differentiate itself by providing superior technical support. Although Acard's only office is in Taiwan, they contract with Mars Technologies in the United States (www.getlaptop.com) for their technical support. We were able to get through to a technician

within five minutes. And in less than ten minutes, Sonnet's phone support was able to answer our simple question about the number of drives you can add to the card.

SIIG and Miglia provide e-mail support for their products, and although both vendors were able to answer our question, e-mail support isn't much help if your new PCI card seems to have crashed your system. SIIG has a technical-support phone number, but it's not toll-free, and it's not listed in the documentation or on the company's Web site. SIIG took a whopping six hours to respond to our e-mail. Miglia has a technical-support number, but it's an international call (to England); however, the company sent a very thorough answer to our e-mail question in an hour and a half.

Macworld's Buying Advice

If you don't mind pulling out a screwdriver and installing the hardware yourself, an ATA RAID card is a fabulous way to add excellent storage capabilities to your Power Mac. We recommend the SIIG card because of its low price and longer warranty, even though it didn't have the best documentation or tech support in the roundup. If you're a RAID novice, you may be better off with the manual and tech support provided by Sonnet, or you can simply avoid the headache altogether by purchasing an external FireWire drive, though it will be more expensive. As for performance, any one of these ATA PCI RAID cards will provide fast, economical, and clutter-free storage. □

* = Editors' Choice.

ATA/133 RAID Cards Compared

COMPANY	PRODUCT	MOUSE RATING	PRICE	OS COMPATIBILITY	CONTACT	WARRANTY	PROS	CONS
Acard	AEC-6880M/ATA-133 RAID	★★★	\$179	Mac OS 9, Mac OS X	[886] (2) 8512 2290, www.acard.com	2 years	Phone support available.	Skippy manual.
Miglia	Alchemy ATA 133 RAID PCI	★★★	\$199	Mac OS 9, Mac OS X	[44] (0) 870 747 2988, www.miglia.com	2 years	Manual includes drive installation instructions for older Macs.	Technical support via e-mail only; relatively expensive.
SIIG *	UltraATA 133/100 RAID	★★★★	\$149	Mac OS 9, Mac OS X	510/657-8688, www.siig.com	5 years	Long warranty; lowest price.	Technical-support phone number not included in documentation.
Sonnet Technologies	Tempo RAID133	★★★	\$200	Mac OS 9, Mac OS X	949/587-3500, www.sonnettech.com	3 years	Phone support available.	Relatively expensive.



ONE FOR EVERY STAGE OF A MOVIE-MAKER'S CAREER.



Mini DV



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Canon
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* Purchase must be made between 3/1/02 and 6/30/02 (GL1: 4/1/02 and 6/30/02). Some restrictions apply. For details and operating system requirements, see claim form at your nearest Canon U.S.A. Authorized Dealer or visit www.canondv.com. © 2002 Canon U.S.A., Inc. Canon is a registered trademark and Canon Know How, Canon Connects, and the Canon Connects logo are trademarks of Canon Inc. ShowBiz is a trademark of Arcsoft, Inc. Microtech and ZiO! are registered trademarks of SCM Microsystems, Inc. Microsoft, Windows, and the Windows logo are trademarks, or registered trademarks of Microsoft Corporation in the U.S. and/or other countries. The Designed for Windows XP logo refers to the digital camcorder and its driver only. Viewscreen images are simulated.

CINEMA 4D XL 7.3

High-End 3-D Package Provides Superior Rendering and Seamless After Effects Integration

BY MATTHEW LOWRIE

Thanks to Apple's adoption of many technologies that professional 3-D artists have relied on for years—such as OpenGL for 3-D hardware acceleration, dual-processor workstations, and video cards (from Nvidia and ATI)—the Mac landscape is fertile with options for 3-D-production artists. We looked at Cinema 4D XL 7, which takes full advantage of the Mac's 3-D-production enhancements and provides excellent rendering capabilities. The recent upgrade, version 7.3 (a free download for owners of version 7), improves the program's OS X compatibility and raises the bar on After Effects integration. Nonetheless, several interface anomalies can make working with Cinema 4D XL 7.3 counterintuitive.

All for One

All 3-D functionality is encapsulated in a single program, so Cinema 4D's workflow is much easier to manage than that of Electric Image's Universe and NewTek's LightWave 3D, which have separate applications for modeling and animating. In Cinema 4D,

you can quickly experiment with models to see how they animate.

Rendering has always been the foundation of Cinema 4D, and in version 7.3, Maxon has added improved antialiasing, radiosity, global illumination, caustics, and a set of new 3-D shaders to the program's already impressive rendering tools. In addition, Cinema 4D's ray-tracing engine has been improved: even on complex scenes using volumetric lighting and refraction, Cinema 4D XL 7's renderer finishes scenes a dramatic four to five times faster than version 6's.

Modeling, animation, character setup, and texturing tools in Cinema 4D are solid. Cinema 4D provides a full set of polygon and NURBS modeling tools, including a surface-subdivision feature called Hyper NURBS. The interface for creating organic shapes with Hyper NURBS is well implemented, giving visual feedback about both the subdivided object and its construction cage. But the program is missing fine-tuning controls such as vertex influence and creasing.

Cinema 4D's practical texturing tools give you WYSIWYG

control over texture maps but would benefit from the addition of an image-placement gizmo or UVW-coordinate editor like those found in Alias|Wavefront's Maya and LightWave 3D.

Decisions, Decisions

The Cinema 4D XL 7 CD installs the program for either OS 9 or OS X. With version 7.3, Maxon has implemented a full Aqua-compliant interface for the program's OS X iteration: you can choose between it and the default cross-platform interface familiar to longtime Cinema 4D users. This new interface is such an invigorating improvement on Cinema 4D's drab interface, it would be the better default interface for OS X.

Cinema 4D XL 7.3's workflow is both natural and easily manageable: tools are positioned conveniently, and keyboard shortcuts are accessible with your non-mousing hand. But there are some actions that would benefit from a more Mac-centric approach. For instance, the viewport navigation relies heavily on the right mouse button in the PC version of Cinema 4D, and the replacement in the Mac version is to hold down the ⌘ key while executing an action using your mouse. Using both hands this way, for such essential, common operations, can be inconvenient.

For production artists looking to splurge on a new dual-1GHz Power Mac G4, Cinema 4D's support for multiprocessor rendering in both OS 9 and OS X may justify the expense. In addition, Cinema 4D's full OpenGL-rendered view ports let you navigate scenes with large polygon counts smoothly and quickly, even with lower-end video cards such as the ATI Rage 128, which shipped with earlier Power Mac G4s. Although scene navigation is speedy, experienced 3-D users will find Cinema 4D's camera orbiting awkward—mouse tracking to the right orbits the view to the left, opposite from most other 3-D programs, including Maya.

After Effects Integration

Version 7.3 introduces direct support for Adobe After Effects

5.0 and later. With multipass rendering, each material attribute in a scene—such as specular highlights, shadows, and transparency—can be rendered separately; the workload is thus divided between the rendering engine and the compositing program. Each pass can then be layered using After Effects blend modes. That way, if you need to make a change, the entire scene doesn't have to be rendered again.

Cinema 4D XL 7.3 works seamlessly with After Effects. The program can save each pass as a separate file, and it can create an After Effects composition file, which contains the blend-mode setting for each pass. Cinema 4D also exports all light and camera information, including animation tracks supported in After Effects 5.5. This is an extremely useful and timesaving feature for incorporating 2-D elements using After Effects' 3-D layers—the 2-D elements take on the same lighting and perspective used to render the Cinema 4D scene.

Macworld's Buying Advice

Cinema 4D XL 7.3 is an extensive application for 3-D production, and it's upping the ante for 3-D on the Mac. Veteran 3-D artists looking for modeling, animation, and rendering tools in a single package will appreciate Cinema 4D's workflow. Novice 3-D-software users may find Cinema 4D's expansive collection of tools daunting, but the manuals and tutorials are well written and well organized, easing the otherwise-difficult learning process. □

RATING: ★★★★★

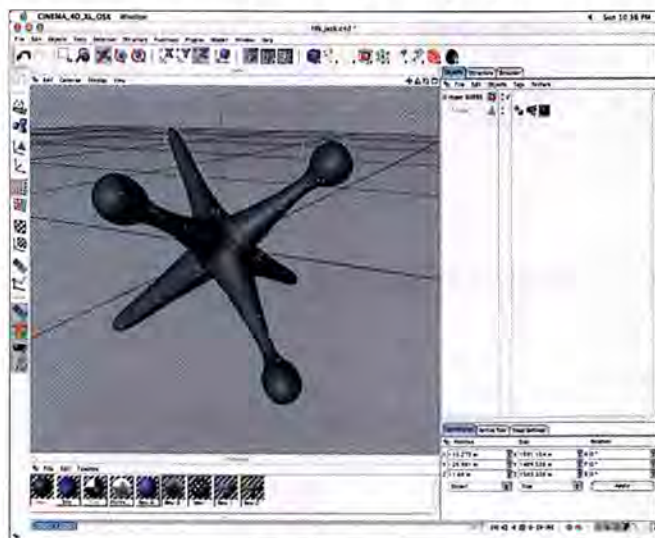
PROS: Extensive array of 3-D-production tools; very fast rendering engine; seamless After Effects integration.

CONS: Some quirky navigation and interface conventions; awkward to use with a one-button mouse.

PRICE: \$1,695

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Maxon Computer, 877/226-4628, www.maxon.net



Cinema Communicates While you're working on a polygonal cage, Cinema 4D XL 7.3's Hyper NURBS gives visual feedback on the surface-subdivided object.

PHOTORETOUCH PRO 1.0

Innovative, Easy-to-Use Retouching Application Is a Worthy Competitor for Photoshop

BY SEAN ASHCROFT

Every once in a while, a new product threatens to change the status quo. Binuscan's PhotoRetouch Pro 1.0 is one example. Intended for digital photographers and prepress professionals, this OS X-native application's intuitive interface and greater productivity are leading some to label it a "Photoshop killer."

Keeping It Simple

No matter what market position PhotoRetouch ends up occupying, one thing's for certain: it's a supremely powerful and intelligently crafted photo-editing and prepress productivity application. Its user interface is one of the least cluttered we've seen, but the program's simplicity doesn't come at the expense of functionality. There are only three floating palettes: one each for tool selection, tool options, and information. PhotoRetouch doesn't employ layers, and its paths and masks are applied directly to images. Maximizing screen real estate is the aim here; another nice touch in that area is the editability of the tools palette. Rarely used tools can be dragged into a toolbox, where they are accessible but out of sight.

Powerful Processes

The engine room of the application is its Process menu, which contains the retouching and reprocessing tools. Every engine room needs a stoker, and Binuscan's is RECO, which draws its name from "rebuilding colors." This color engine has its roots not in color research done by someone sitting in a lab, but in real ink, a real press (Planeta offset), and a maniacally dedicated pressman—Binuscan's founder, Jean-Marie Binucci. In the early 1990s, he spent a year doing little more than printing millions of color swatches, in a bid to create a satisfactory desktop color-separation solution for his own

use. This work informs RECO, a technology that provides one-click optimization of an image's levels, reorganizing the histogram for smoother transitions. As a quick, accurate way to enhance image data—not just color—it's unbeatable, and it's far better than Photoshop's Auto Levels feature.

face: each Process window has a before-and-after window that shows your changes in real time, so you don't have to apply and reapply processes.

The JPEG Removal feature will especially please graphics and prepress professionals. JPEGs look fine on monitors, but defects caused by lossy JPEG compression—such as jagged edges—are obvious in print. JPEG Removal replaces this information.

On the strength of single features alone, PhotoRetouch will also appeal to niche markets. Photo labs will love its Quanti-

verting to CMYK and losing information in the process.

Another great print-specific feature is Descreening. Most newspapers must at some point reprint an image. Descreening prevents the horrible moiré effect that normally occurs.

Then there's the Vacuum Cleaner, a real-time touch-up tool that eliminates dust and scratches far better and quicker than Photoshop's cloning tool.

CDC 4x, meanwhile, is an interpolation feature that's actually worth having; it can increase image size by as much as 200 percent with impressive results (useful for increasing the size of images from low-end digital cameras). Unlike bicubic interpolation (which generates jagged, blur, and color changes), CDC 4x preserves edges, sharpness, and colors.

Bundled with PhotoRetouch Pro 1.0 are reflective and transparent (and always pricey) color targets for creating ICC profiles for workflow peripherals—not every PhotoRetouch customer will need these, so why not offer a less expensive version without them? We encountered a stability issue, too: the Warp tool crashed the application in both OS 9 and OS X. PhotoRetouch can also run like syrup in OS 9.

Macworld's Buying Advice

Prepress professionals who use Photoshop solely for color correction and separations are missing out: PhotoRetouch Pro 1.0 offers smarter, more-accurate color-management and improvement tools. If, however, you rely on Photoshop's image-manipulation tools, you should view PhotoRetouch as a powerful companion product. □

RATING: ★★★★★

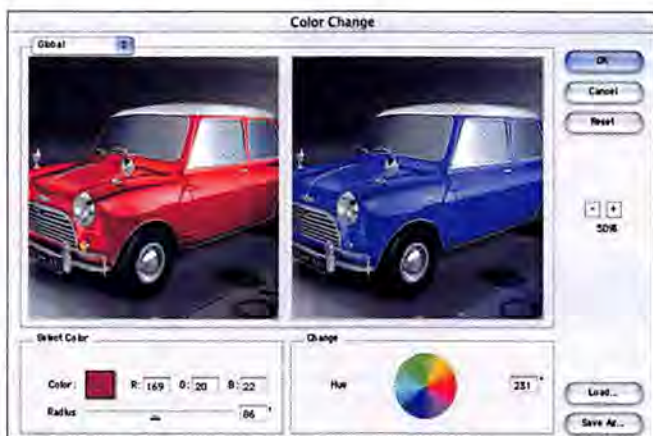
PROS: Powerful color engine; intuitive interface; great tools and features; unrivaled color-separation tools.

CONS: Minor stability problem with the Warp tool; sluggish in Mac OS 9.

PRICE: \$749

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Binuscan, 914/381-3780, www.binuscan.com



All Change PhotoRetouch Pro's Color Change feature lets you change any color—in real time and without requiring fine-tuning—with one mouse click.

Processes can be applied globally or to a selection, and it's here that PhotoRetouch promises serious productivity gains, courtesy of its Paint Process tool. Applying image changes to a selection in Photoshop is a multistage process, involving selection tools and the creation of masked-off adjustment layers. In PhotoRetouch, activating the Paint Process mode brings up a contextual menu of processes. Real-time changes made in the chosen process's window are not applied to an image itself; they are painted on with the Paint Process tool, which can be adjusted to paint strokes of any width from 4 to 500 pixels. This maskless painting on of sharpening, smoothing, saturation, and color changes is liberating.

Other features in the Process menu are equally useful, and they all benefit from PhotoRetouch's well-designed inter-

fier process, which offers accurate one-click color correction for time-faded color photos, while medical professionals and forensic scientists will prize its DA Radio process, which adds 3-D detail to 2-D X rays.

Of processes with equivalents in Photoshop, PhotoRetouch's Sharpen, Grayscale Conversion, and Saturation produced far superior results in our tests. PhotoRetouch's cropping and path-creation tools were also superior in terms of ease of use and productivity.

Print-Specific Features

Binuscan's print background is never more evident than in PhotoRetouch's color-separation tables, which are built on ICC architecture. CMYK channels can be edited even when an image is RGB, so you can use maximum color information when working on separations—instead of con-

TOAST WITH JAM

Professional-Quality Audio-CD-Creation Program Gets Help from an Old Standby

BY JONATHAN SEFF

Due in part to the complexities of developing for a new operating system, software companies have been relatively slow to release audio applications for Mac OS X. With Jam 5, Roxio has not only brought its versatile audio-CD-creation software to OS X, but also integrated it with Toast 5 Titanium, the company's flagship CD-burning program for the Mac. In fact, the package is called Toast with Jam because Jam is no longer a stand-alone product; it now requires Toast to burn the audio CDs you create. And although Jam is a professional-level application that can create CD masters for mass duplication, the new bundle is such a good value that overcoming the limits of iTunes, Discribe, and even Toast is well within reach, even for audio hobbyists.

No Milquetoast

All updates to Toast 5 Titanium (★★★★; Reviews, July 2001), including the update that allows Toast Titanium to run natively in OS X, have been free downloads. Toast is now fully functional in OS X, with the exception of the Toast Audio Extractor application. As a part of the Toast with Jam release, Toast provides the support for burning your Jam-created audio to CD, as well as all of its previous functionality. We've been able to burn, without any problems, data CDs in various formats, data and video DVDs, audio CDs, and VCDs.

Spreading the Jam

The first thing you'll notice about Jam 5—besides the fact that it runs in OS X—is its attractive interface, which

sports a larger, more refined playback area that's easier to view and control than that of previous versions.

Jam can import AIFF, WAV, MP3, Jam Image, and other QuickTime-compatible files, as well as Sound Designer II files



Buttering It Up Jam 5's updated interface includes a playback area that clearly shows the options for each track; the playback window is displayed at the top left.

and regions, making it suitable for all types of music production. Although all standard audio CDs must conform to the Red Book audio standard (44.1kHz, 16-bit, stereo files) when they are burned, the new version of Jam can import 32-bit audio, now common in professional and home recording.

To get the best possible sound from your audio, Jam also now engages in *dithering*, which reduces audio to 16-bit files more smoothly than would truncating the extra bits. And any sample rates higher than 44.1kHz are downsampled via QuickTime.

Working on the Tracks

Adding tracks to Jam is as simple as dragging and dropping them into the track window, through which you have control over almost every aspect of your audio tracks, such as gain, fades, and track lengths. Best of all, every adjustment you make is

nondestructive—none permanently changes the actual audio files. If you want to make more-complicated, precise edits—such as adding effects with VST plug-ins or marking individual tracks within a larger recording—before you bring the files into Jam, you can do so using the included Peak LE VST 3.0, from BIAS.

One area that has been improved in this version of Jam is cross-fading. Previous versions had several presets for overlapping tracks and fading them into one another (also included in this release), but the new cross-fade tool gives you the ability to make custom cross-fades. And the new waveform display gives you a visual representation of where your fades start and stop and how long they last, for example.

Among the many features you benefit from by using Toast with Jam instead of Toast alone are volume adjustments.

In Jam you can adjust the gain for each track individually, either one channel (left or right) at a time or as a whole. You can also *normalize* an entire CD or individual track to raise the volume to a safe level without fear of *clipping*, which causes ugly distortions and can occur with digital audio whose gain has been set too high.

Jamming with Toast

After you've set up your disc in Jam, it's time to burn—and here Jam 5 makes a major break from the previous version. Unlike earlier versions of Jam, this one doesn't have its own burn engine; it must use Toast to burn your CDs.

To preserve the more advanced features in your Jam project when importing into Toast (cross-fades, index points, and trims, for example), Jam creates a temporary disc image. Although this is a clever way to make the two programs work together, it also makes the burning process more

time-consuming than it was in previous versions of Jam. On a 450MHz Power Mac G4, Jam took more than 90 seconds to create an average-length CD's image. That image is deleted after you burn a disc, but if you don't want to have to create an image for *each* copy of a CD you want to burn, you can manually save your project as a disc image and keep it until you no longer need it.

Because Jam itself doesn't allow you to choose which drive you'd like to use for burning (there's no indication from Jam that any drive is recognized), we had a problem burning CDs on our test machine, which had both an internal DVD-R (SuperDrive mechanism) and a faster, external FireWire CD-RW. To specify the drive you want to use, you must first open Toast and choose from the list of drives under Recorder Info—it will then save your drive preference when you burn via Jam as well.

Macworld's Buying Advice

Although forcing Jam to rely on Toast makes audio mastering somewhat less convenient, this solid version of Jam brings the program's powerful features to OS X. And this bundle is a great deal, given that you get both programs for the price Roxio used to charge for Jam alone.

Jam is an easy-to-use program fit for novices, hobbyists, and audio professionals, and it offers audio-mastering features that other apps can't touch. And with the full version of Toast Titanium, you can burn in every CD, DVD, or VCD format you're likely to need. □

RATING: ★★★★★

PROS: Improved cross-fades; 32-bit-audio support; built-in dithering; Peak LE VST 3.0 included.

CONS: Burning process more time-consuming than in previous versions; requires Toast (included) to burn.

PRICE: \$200; upgrade from Toast Titanium, \$100

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Roxio, 866/280-7694, www.roxio.com

TIFFANY3 PROFESSIONAL 3.5

Powerful Image Processor Has a Unique Approach

BY BRUCE FRASER

Don't think of Caffeine Software's TIFFany3 Professional 3.5.3 as one of Adobe Photoshop's competitors—it's really in a breed of its own. Caffeine calls TIFFany3 an image processor rather than an image editor, and it's right to do so. Unlike Photoshop, the OS X-only TIFFany3 provides tools for building automatic processes you can apply to many images at once. TIFFany3 is a powerful, customizable tool; however, because the program isn't as interactive as it could be, it requires you to plan ahead.

Redefining Actions

Just about everything you do in TIFFany3 depends on actions. The program includes more than 500 preconfigured actions, which you can modify and string together to make new ones. And what sets them apart from the actions found in Photoshop is that they're not macros that administer operations; they're the operations themselves.

TIFFany3 gives you three types of actions for editing images: standard, mask, and process. Using standard actions, you can modify your image in ways that range from tweaking brightness, contrast, or color, to applying Mandelbrot texture generators. Mask actions let you select parts of an image—based on brightness or color differences or on geometry—to isolate a range of color or tone, or to create holes, rays, vignettes, and other geometric selections. Process actions allow you to chain multiple actions together and, via a flowchart, create image-processing instructions. These instructions can be simple—for example, rotating an image. And they can be very complex; you might create a combination of standard actions that gives an image the qualities of an oil painting. Simple process actions are

easy to build, but it takes a lot of learning to fully take advantage of their possibilities.

All actions are listed in the Actions Catalog dialog box—organized like OS X's columnar file browser—and you select them from an Actions Categories list.



TIFFany at Work TIFFany3's tool palette always appears in the document window. Also shown is the Actions Catalog dialog box (upper left); the Components Inspector pane (lower left), for managing layers and marquees; and the Rainbowbow action's Action Inspector controls (lower middle).

The concept of actions is not only interesting but also incredibly useful. Its strength is that it lets you easily configure tools to suit your needs; its corresponding weakness is that you must understand how to configure actions to achieve what you want.

Layer upon Layer

TIFFany3 supports an unlimited number of layers and provides full control over transparency. You can drag layers from one document to another and even drag an image file from the Finder into an existing document, where it becomes a new layer in that document. An action applies only to the main layer, but managing layers is straightforward—you view all your layers in the Components Inspector window, where you control their visibility, and the Flatten tool merges visible layers.

TIFFany3 automatically adjusts for differences in resolution, size, and color space. (It honors embedded ColorSync profiles for correct display but does not as yet let you select a profile for the output space—this is high on Caffeine's list of priorities for a future revision.)

Applying Actions

You can apply actions in a number of ways: to an entire layer, to a marquee selection, through a "bitmap marquee" (an arbitrary selection created by a mask

intuitive, but you'll have to consult the manual when you start exploring different compositing and blending options in depth.

Although actions offer tremendous capacity for layers, they lack the immediate interactivity of traditional image-editing tools. When you edit actions in TIFFany3, your only feedback is a too small proxy window that shows the action as it would apply to your entire image, not to the section you've selected. Essentially, you edit your image by trial and error until you increase your ability to predict results.

Batch Processing

TIFFany3 offers flexible batch-processing features. The Document Manager lets you process many images, but unlike most batch processors, it lets you apply different actions to each image once you start the batch. To select the documents you want to include, you drag files or folders from the Finder into the Document Manager's Documents column. You then select your documents and the action you want to apply, and click on the Apply button. (According to Caffeine Software, a server-based version is in the works.)

Macworld's Buying Advice

The more experienced you are with conventional image-editing programs, the more challenging it may be to work the way TIFFany3 does. But if you need strong batch-processing capabilities, TIFFany3 Professional 3.5 is a real powerhouse. And if you're looking only for an easy way to enhance images, the less-expensive TIFFany3 Basic (\$333) is more than adequate, though it limits you to standard and mask actions. □

RATING: ★★★★★

PROS: Straightforward user interface belies a surprising amount of depth; strong batch-processing capabilities.

CONS: No interactive image preview.

PRICE: \$444

OS COMPATIBILITY: Mac OS X

COMPANY: Caffeine Software, 408/249-1290, www.caffeinesoft.com

FONT RESERVE 3.0 SINGLE USER

Professional Font-Management Software with a Penchant for Zealous Organization Comes to OS X

BY ANDREW SHALAT

Font management for the Mac has never been easy, and OS X made it even more confusing by storing fonts in at least four different places on your machine. Managing fonts without the assistance of a utility such as DiamondSoft's Font Reserve or Extensis's Suitcase is a time-consuming journey that few of us want to take. Although Font Reserve 3.0 Single User trailed Suitcase 10.1 (★★★★; *Reviews*, April 2002) in coming to OS X, it's a worthy competitor. This version of Font Reserve has a new Aqua interface and the program's tried-and-true easy font filtering; it lets you manage your fonts in OS X's Classic mode in a familiar way and introduces a feature that helps you avoid font conflicts in both OS X and Classic.

What's New

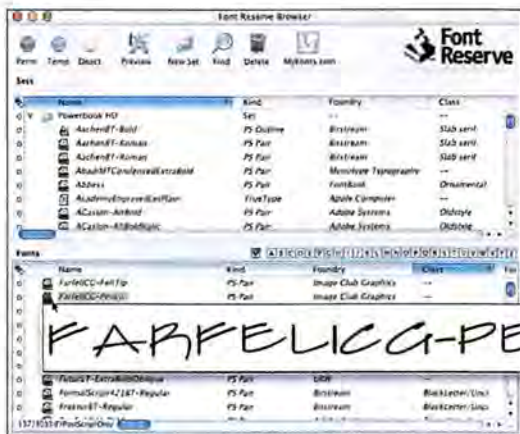
Font Reserve 3.0 consists of four main components. The control panel, now called Font Reserve Settings, activates or deactivates the browser and the database. Font Reserve Browser lets you organize your fonts into sets; activate, deactivate, and preview fonts; and print out samples. Font Reserve Database is where all the font sets and the links to fonts reside. And Classic Activator enables fonts for applications running in Classic.

Font Reserve's basic interface is similar to that of previous versions, and Font Reserve Settings has essentially the same layout as the earlier Font Reserve control panel. From this panel, you can set Font Reserve to turn on when your Mac restarts, activate certain fonts in Classic, activate fonts automatically when a program or

document calls for them, and choose which user's Font Reserve Database to cull your fonts from.

To Each His Own (Fonts)

Font Reserve has always been able to let each of a Mac's users have a completely different font collection. And within each data-



This Font Is Your Font Using Font Reserve Browser, you can create sets, move fonts between sets, and preview fonts.

base, or working set of fonts, each user could also have different font sets. This works especially well now, given OS X's multiuser-centric setup.

But by design, OS X doesn't allow Font Reserve 3.0 to turn on or off any of the fonts found in OS X's or Classic's System font folders—if they're in the System Folder, they're activated.

To work around this, DiamondSoft has added an excellent new feature called System Font Handler. Found under Font Reserve Browser's File menu, System Font Handler lets you disable all but the most essential of your System fonts. By eliminating these from the list, there's less chance of font conflicts between similarly named or duplicate fonts activated from another user-based font set. This feature can prove a valuable asset if you want your fonts to load as quickly as possible, speeding up your workflow.

Organizing Fiend

Activating and organizing fonts in Font Reserve is the easiest part of the program, as it should be, and the way it's done hasn't changed much in this version. If you know where your fonts reside, you can just drag the folder or set of folders directly onto the Font Reserve Browser window and let Font Reserve build its database then and there.

If your fonts are in various places on your hard drive—or if you just don't know *where* they are—you can simply drag your hard drive's icon directly onto the Font Reserve Browser window and let Font Reserve find the fonts for you. This version, running in OS X, scanned fonts more slowly than Font Reserve 2.6 did in OS 9, but the one-time speed slowdown may be imperceptible to the average user.

To use Font Reserve to preview a font, you must hold down the ⌘ key while clicking on the font—a minor but inconvenient step. In Suitcase, a preview of all your fonts is always available in the interface's right-hand pane.

One of Font Reserve's best longtime features is its filtering, which makes it easy for you to view only the typeface or font style you want to see. For instance, using the filter, you can view only active fonts, only System fonts, only fonts with duplicate IDs, or only PostScript or TrueType fonts. You can even sort them by the Font Foundry if you wish. The lower pane of the Font Browser window shows you results and allows you to activate fonts individually.

But Wait, There's More

Like previous versions, Font Reserve 3.0 includes plug-ins for

QuarkXPress, Adobe Illustrator, and Adobe InDesign that provide automatic activation of fonts from within those programs.

Note that while running Font Reserve, you can't run any other font-management utilities. So if you have Suitcase installed in OS 9 but Font Reserve in OS X, you may need to deactivate Suitcase before starting work.

Font Reserve has also added a font-buying link to Font Reserve Browser. MyFonts.com, an online font clearinghouse, is certainly a great resource, but the MyFonts.com button built into the Font Reserve Browser window is a little intrusive. We haven't yet decided whether this button is geared toward the user's convenience or the company's marketing strategy.

Macworld's Buying Advice

Font Reserve is still a great utility, and it's bridged the OS 9–OS X chasm without sacrificing its well-earned position as one of the two most comprehensive and easy-to-use font-management applications around.

The major difference between Font Reserve 3.0 and its competitor, Suitcase 10.1, is that Suitcase runs as a separate application that disables all your activated fonts when you quit the program, and Font Reserve works as a background application that's active for as long as you set it to be. The choice between them may come down to their respective interfaces—Suitcase's is slick and attractive, while Font Reserve's isn't as pretty but provides a fine degree of control. □

RATING: ★★★★★

PROS: Familiar, easy-to-understand interface; System Font Handler can remove unneeded System fonts; great organizational and filtering functions.

CONS: Runs slightly slower than previous versions when scanning for new fonts; inconvenient font previewing.

PRICE: \$100; download, \$90; upgrade from Font Reserve 2.6, free

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: DiamondSoft, 415/381-3303, www.fontreserve.com

COMMANDPOST AND SHUTTLEPRO

Timesaving USB Video-Editing Controllers Combine Efficiency and Functionality

To video editors, few things are more exciting than devices that save time. Video-editing controllers such as Contour Design's ShuttlePro and Focus Enhancements' CommandPost do just that, by combining frequently used command shortcuts and precise control in one unit. Both are USB-powered and compatible with a variety of video applications including Apple's Final Cut Pro and iMovie, and Adobe Premiere. But the OS X-native ShuttlePro, with its streamlined design, solid feel, and practical features, is the better choice.

ShuttlePro

The elegantly designed ShuttlePro feels as comfortable as it looks. With its 13 well-placed, fully programmable function keys, you can activate frequently used editing shortcuts with one hand. The outer ring of its jog/shuttle knob lets you fast-forward and rewind through video material, while the inner portion gives you frame-by-frame control.

We had the ShuttlePro set up within minutes. The drivers for OS 9 and OS X are available both on the CD that ships in the box and at Contour Design's Web site, where you'll also find sets of key functions for most popular applications, including Final Cut Pro and Adobe Premiere, After Effects, and Photoshop. You can also easily program your own set of key functions.

CommandPost

Focus Enhancements' similarly priced CommandPost controller offers less stylistic finesse. Taking its design cues from a video switcher, the bulky unit provides a jog/shuttle knob and 15 programmable buttons like those on the ShuttlePro. The CommandPost also has cus-


tomizable key-function sets for a wealth of applications, as well as a fader arm, which controls system volume in Final Cut Pro, and a joystick that can replace a mouse. Though the fader arm was occasionally useful to us, the joystick proved to be flimsier and less accurate than a mouse.

Once we rectified some setup snags due to outdated software, editing in Final Cut was a breeze. And the CommandPost's internally illuminated base makes it easy to read the buttons in dark editing rooms, a nice feature the ShuttlePro lacks.

Macworld's Buying Advice

For a video editor or multimedia professional, either the ShuttlePro or the CommandPost would be a time-saver. In OS 9, they work equally well, although the CommandPost has a broader tool set. But with OS X support and a sturdier feel, the ShuttlePro has the edge.—ANTON LINECKER

COMMANDPOST

RATING: 

PROS: Internally illuminated base helps you see buttons; fader arm lets you control volume.


CONS: Bulky; feels flimsier than the ShuttlePro.

PRICE: \$99

OS COMPATIBILITY: Mac OS 9

COMPANY: Focus Enhancements, 800/338-3348, www.focusinfo.com

SHUTTLEPRO

RATING: 

PROS: Elegant design; easy to use.

CONS: No internally illuminated base for buttons.

PRICE: \$99

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Contour Design, 800/462-6678, www.contourdesign.com



SHUTTLEPRO PHOTO BY STEPHEN SUGG



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STUDIO ARTIST 2.0

Smart Paint Tools Dulled by Not-So-Bright Interface

Synthetic Software's Studio Artist 2.0 is like an art studio overflowing with natural-media tools—watercolors, oils, chalks, pencils—many imbued with their own creative brilliance. But like a studio jammed with paints labeled in Latin and tools scattered about in disarray, Studio Artist's nonstandard interface and countless confusing options are likely to boggle even the most unorthodox mind.

The software is billed as an "image synthesizer" rather than a paint program; instead of letting you paint from scratch, it limits you to using its 2,000 predefined tools, called *patches*, to modify existing photos or artwork. But these patches are merely presets, which you can manipulate to create a limitless number of your own effects using more than 300 parameters and scripted actions.

Cloning Around

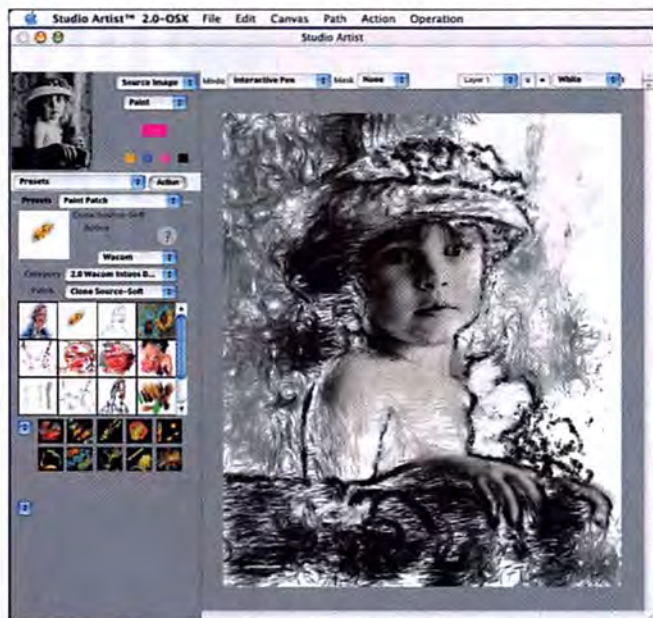
When you begin a new project, Studio Artist asks you to select a source image, even if you plan

to paint on a blank canvas. The program clones the original image, and the cloning tools automatically pull colors from the underlying source image while you paint. You can even clone some or all of a QuickTime movie's frames to create hand-painted rotoscoping and filter effects.

Paint Smart

Studio Artist takes painting a few steps further with its Intelligent Assisted brushes. Using one of these brushes and the Action pull-down menu, you can let Studio Artist paint for you, filling a canvas with brush strokes that follow the natural lines of a model's hair and face or the complex patterns in a patchwork quilt.

When painting manually, you can use the Intelligent Assisted brushes so that, for example, a simulated watercolor paint spreads naturally, but then pools up as if blocked by a wall when it encounters a contrasting contour in the source image. Also new in version 2.0 are par- >>



Sit Back and Relax Studio Artist's Intelligent Assisted painting tools automatically follow the contours of source images, creating realistic natural-media effects. The program created this painterly image—without human intervention—by running a preset action on a digital photograph.



Be Good
**BLACK
&
WHITE**
The choice is yours



REVIEWS

ticle paints, which behave like an army of ants with paint on their feet. As you move your brush, these particles march outward, following the contours in the image and tracking paint as they go.

Like most painting applications, Studio Artist benefits greatly when you use it with a Wacom pressure-sensitive graphics tablet, but it goes a step further by allowing you to combine mouse and pen inputs simultaneously (which can be awkward). You can also assign customized pen settings to any preset brush.

Another welcome addition to this version is alpha transparency for each layer; this allows you to blend and move layers independently. While Studio Artist supports onion skinning, we wish it could be turned on layer by layer, with variable transparency.

Because Studio Artist's paint strokes use resolution-indepen-

dent Bézier curves, you can paint on a low-resolution image and then scale the canvas to larger sizes with no loss of image quality. However, it's particularly



Layer upon Layer The Layers palette allows you to set alpha transparency for each layer.

frustrating that the program discards Bézier data when you save an image.

Studio Artist also lacks an equivalent to Corel Painter's textured painting surfaces, which can make the resulting art significantly more realistic.

Abstract Interface

Despite its impressive engineering and useful features, Studio Artist would benefit from an interface overhaul. Its deviations from Mac interface conventions will exasperate artists. For example, Studio Artist's deep-level palettes abound with percentage sliders that offer no visual feedback and few clues as to their actual use. The program supports alpha masks but doesn't visually represent them. And the software doesn't have multiple undos, a serious failing in a product that encourages experimentation.

Studio Artist 2.0 can sometimes be uncomfortably slow; automated cloning of an NTSC-resolution movie took a minute or more per frame on a dual-processor 800MHz Power Mac G4. Although version 2.0 is OS X native, we had several crashes in OS X, and performance is a bit slower than in OS 9.

Macworld's Buying Advice

Studio Artist 2.0 is a conflicting blend of innovative, realistic natural-media tools and a not-so-brilliant interface. As a program that can help you turn unimpressive pictures into beautiful digital art or experimental QuickTime video, Studio Artist has immense potential, but its shortcomings are too significant for us to wholeheartedly recommend it.—BEN LONG

RATING: ★★

PROS: Huge assortment of painting tools; automatic and manual editing of images.

CONS: Frequent crashes; non-standard interface; little or no visual feedback from many complex controls; no multiple undos; inability to save Bézier data.

PRICE: \$379; upgrade from previous versions, \$179

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Synthetik Software, 888/808-4188, www.synthetik.com

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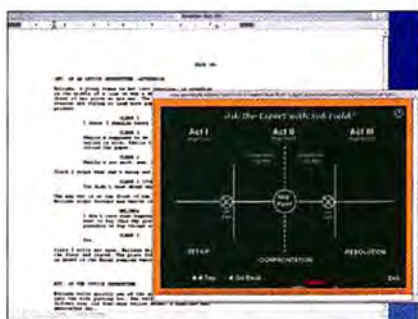
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FINAL DRAFT 6

Straightforward Scriptwriting Program Takes the Hassle Out of Professional Script Formatting

How fast can a writer pound out a script? Pretty quickly, thanks to Final Draft 6. Like version 5, this incarnation is a full-featured yet uncomplicated application customized for screenwriters and playwrights. Both beginners and experts at formatting scripts can begin writing within minutes of installation. Final Draft 6, which now runs on OS X as well as OS 9, has a sleeker interface than its predecessor, and it's cross-platform, so you can send scripts to and from Windows machines. Final Draft doesn't include animation capabilities and multimedia script formats (as does Final Draft's higher-priced competitor, Screenplay Systems' Movie Magic Screen-



Interactive Problem Solving Final Draft's Ask The Expert feature is one of many helpful scripting tools.

writer 2000). But most writers, especially newcomers to scriptwriting, will find that Final Draft is more than adequate.

The latest version's interface, like version 5's, provides you with all the tools of a word processor but eliminates hours of format-

ting time and repetitive typing, so you can concentrate on content. Simply press the return or tab key to execute a macro or shortcut command, and the Elements window offers a list of formatting actions. You decide which elements—dialogue, character, or shot, for example—to add. With one keystroke, you've got a professionally formatted script.

Writers will find it easy to integrate Final Draft's new features—tools such as ScriptCompare, which lets you compare two versions of the same script on screen, and Format Assistant, which catches formatting errors—into their routines. The program also lets you export scripts to PDF when you're submitting them electronically.

Final Draft provides multiple templates derived from scripts of TV shows such as *Buffy the Vampire Slayer*. You can use paragraph styles such as scene headings and dialogue to give your work a pro-

fessional look, even if you're writing your very first script.

The user manual includes helpful tutorials, and the interactive Ask The Expert window outlines story development step-by-step and helps you identify and solve problems with plot, character, and structure.

Macworld's Buying Advice

Final Draft 6 is similar to version 5, but it's OS X native. That, its Ask The Expert feature, and its enhanced interface make upgrading worthwhile. Final Draft delivers timesaving tools for scriptwriting and no major drawbacks.—ADRIENNE ROBILLARD

RATING: ★★★★★

PROS: Cross-platform compatibility; intuitive; helpful Ask The Expert feature.

CONS: No toll-free technical support.

PRICE: \$199; upgrade, \$69

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Final Draft, 800/231-4055, www.finaldraft.com

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FIREWIRE KEYCHAIN

Portable FireWire Hard Drive Puts Old Flash Cards to Good Use

WiebeTech's FireWire Keychain lets you turn the large-capacity IBM MicroDrive or CompactFlash memory card used in many digital cameras into an ultra-portable, bus-powered hard drive. Using a drive the size of a box of Tic Tacs to boot your computer or transport files is cool, but the high price and slow performance of large-capacity memory cards (compared with standard FireWire drives) might leave a bad taste in your mouth.

The Keychain ships without a memory card installed, so if you already own one, the Keychain is a good investment. Installing a CompactFlash card or IBM MicroDrive in the FireWire Keychain requires removing two small screws and inserting the card into the case. The Keychain's connector pins can bend, so swapping cards is inadvisable. As a consequence, while you'll gain durability and portability with the FireWire Keychain's closed, metal case, you'll lose the flexibility that traditional media readers offer for about the same price.

The operating system you use, the type of card installed, and the formatting of the drive can all affect the FireWire Keychain's performance. The units we tested came formatted for both Mac and Windows. Reformatting them as HFS+ cut read and write times in half. Compare: the 20GB LaCie PocketDrive (*Reviews*, January 2002) read, wrote, and duplicated a 50MB file in 19 seconds, while our fastest Keychain configuration, with a 256MB CompactFlash card, clocked in at 65 seconds.

Macworld's Buying Advice

The FireWire Keychain is the smallest FireWire drive we've seen. If you have large-capacity memory cards gathering dust, the FireWire Keychain is a great way to put them to use. If not, you can get more for your money by buying a standard portable FireWire hard drive.—JAMES GALBRAITH

RATING: ★★★

PROS: Ultra-portable; bus powered; durable; cool design.

CONS: Ships without a memory card.

PRICE: \$100

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: WiebeTech, 316/744-8722, www.wiebetech.com

ARTMATIC PRO 2.5

Intriguing Art Synthesizer Offers New Tools and Templates

If you're looking for an easy way to create compelling abstract images and animations, ArtMatic Pro 2.5, from U&I Software, is a good bet. Like ArtMatic 1.2 (*Reviews*, June 2000), it uses mathematics to generate remarkable art, and it requires skills no more advanced than the ability to operate a mouse.

With version 1.2, it was difficult to predict results of the program's mathematical operator modules, which generate the images. But this new version lets you fine-tune your creations. It includes more than 3,000 tweakable *presets* (templates) you can use as the basis for your own compositions. An expanded set of graphics generators and filters and an animation-preview feature for exporting QuickTime movies are just as welcome.

The presets are found in ArtMatic Browser, a separate application that organizes images by type—Skies & Clouds and Botanic, for example. Although it's still easier to click on the interface's large die to generate an image at random, you'll have better luck achieving your desired outcome if you select and modify a preset.

Rendering a high-resolution QuickTime movie can take a long time—a few seconds per frame on a 400MHz PowerBook G4—so knowing in advance how the movie will turn out is worthwhile. This was difficult to discern with the previous version's low-resolution Random Path Animation feature. But ArtMatic's new Preview feature offers a higher-resolution look at your QuickTime movie.

ArtMatic brims with improvements, but it could still benefit from a multiple-undo command for when you've tweaked an image a few times too many.

Macworld's Buying Advice

A digital artist or graphic designer who wants to generate otherworldly art with minimal effort will find that ArtMatic Pro 2.5 is a worthy addition to an artistic arsenal.—CHRISTOPHER BREEN

RATING: ★★★★

PROS: Easy-to-use art generator; includes many templates; helpful animation preview.

CONS: No multiple undos.

PRICE: \$199

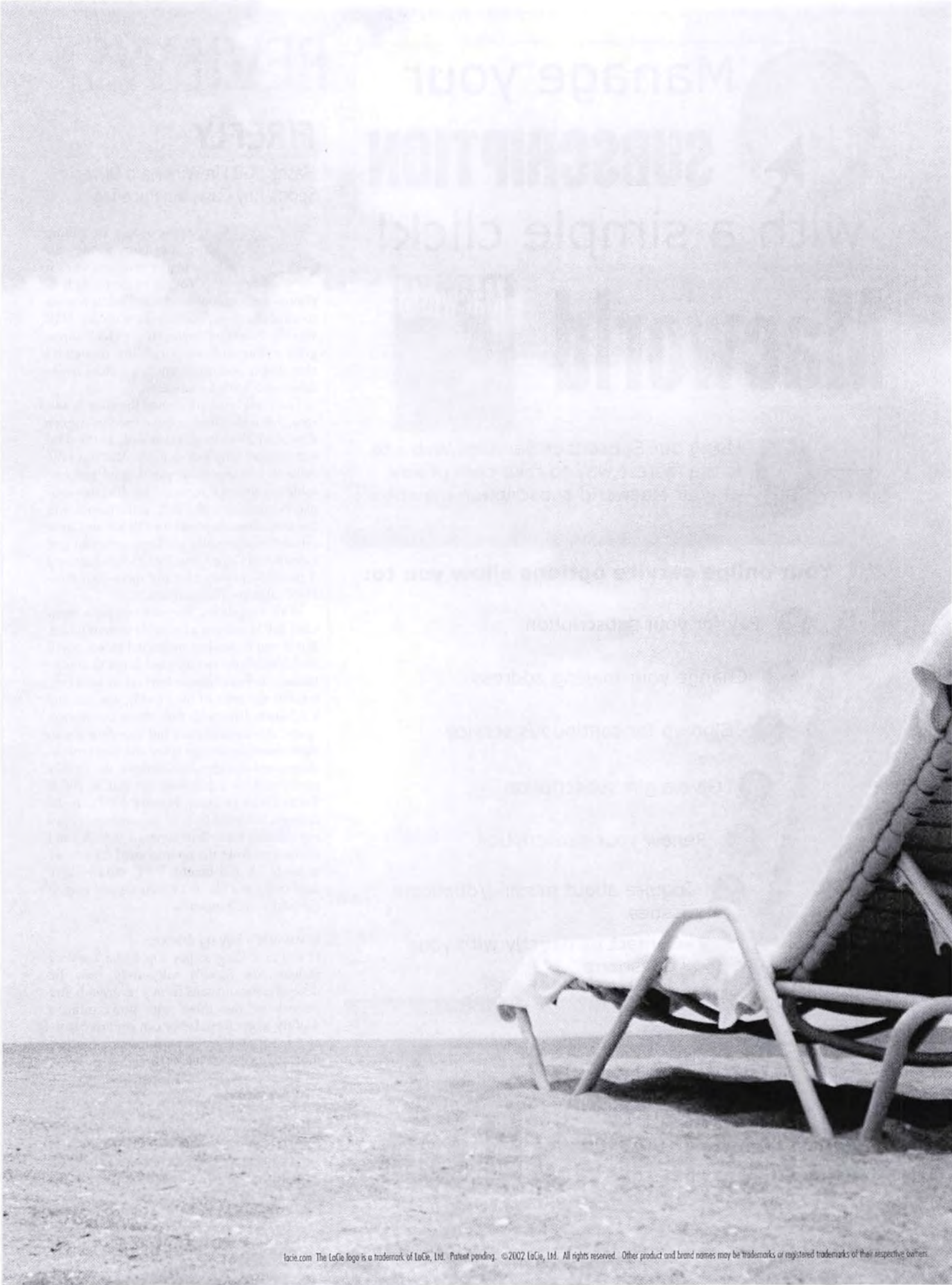
OS COMPATIBILITY: Mac OS 9

COMPANY: U&I Software, 650/364-0556, www.uisoftware.com



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REVIEWS

FIREFLY

Flashy 5GB FireWire Hard Drive
Sports Tiny Case, Big Price Tag



Some people are willing to pay more money for smaller products when it comes to items such as phones and computers. SmartDisk is hoping to capture these consumers with its 5GB FireFly FireWire hard drive—which offers great styling and easy portability, though it's also slower and more expensive than larger drives and holds far less data.

The FireFly is built around the same 4,600-rpm, 1.8-inch Toshiba drive used in Apple's iPod, and it's as long and as wide as the iPod but roughly only half as thick. And since the drive is bus powered, you'll need just one cable to connect it to your Mac. It's plug-and-play compatible with OS X, and it comes with the extensions required for OS 8.6 and later. (SmartDisk provides its Tools program and Connectix's CopyAgent for OS 9 and earlier.) A padded carrying case and three-foot FireWire cable are also included.

With 5 gigabytes, there's room for a thousand MP3s or even a bootable system folder. But if you're hooked on digital video, you'll find that iMovie eats up space faster than contestants on Fox's *Glutton Bowl* eat sticks of butter. For the price of the FireFly, you can buy a 2.5-inch drive with four times the storage space; also available are full-size drives with eight times the storage space and faster mechanisms and circuitry. For example, the FireFly performed on a par with the LaCie 20GB PocketDrive (*Reviews*, January 2002), duplicating a 100MB file in 18 seconds and copying a 60MB folder (containing 1,000 files and subfolders) from the internal hard drive in 41 seconds. A full-height VST 40GB drive duplicated the file in 14 seconds and copied the folder in 29 seconds.

Macworld's Buying Advice

If you're willing to pay top dollar for cool gadgets, the FireFly will surely draw the desired oohs and aahs from your friends and coworkers. But those who don't mind a slightly larger form factor can get more storage space and faster performance for less money.—JAMES GALBRAITH

RATING: ★★★

PROS: Streamlined case design; bus powered.

CONS: Expensive for speed and amount of storage.

PRICE: \$200

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: SmartDisk, 941/436-2500

www.smartdisk.com

PROSCOPE

Handheld USB Microscope Captures the Big Picture

Scalar's ProScope, distributed by Dr. Bott, is a handheld microscope that makes objects appear larger than life. Unlike conventional microscopes, the ProScope doesn't force you to cram subjects onto tiny glass slides, so it's ideal for magnifying living things. The ProScope is practical for many situations, from forensic investigations to lab experiments, and it's an ideal learning tool for a science class.

The ProScope resembles a compact hair dryer, and it's just as easy to use. To focus, nearly all you have to do is point; anything in its view is displayed on your monitor. And the USB cable powers six bright LEDs, so you don't need a separate light source. If the standard 50x lens isn't powerful enough, you can



attach an optional 100x or 200x lens (\$109 and \$129, respectively) in a jiffy. The ProScope ships with a driver for OS 8.6 through OS 9; an electronic manual; and an intuitive application called USB Shot, for displaying and saving images. (The company is planning to release OS X-compatible drivers and software this summer.)

USB Shot supports three image-capture settings. In the program's Snapshot mode, you can save the displayed 640-by-480-pixel image as a JPEG or PICT file when you press a button on the handle. In Movieshot mode, you can create 320-by-240-pixel or 640-by-480-pixel QuickTime movies. And Interval mode lets you store time-lapse sequences with intervals as short as 1 second or as long as 24 hours—for example, you could set up the ProScope to record the growth of a germinating seed over several days. The program's image controls make it easy to tweak white balance, auto-exposure, saturation, and other settings.

Macworld's Buying Advice

We had a great time using the ProScope to examine the world from an insect's perspective. Although it can't replace a high-power microscope, the ProScope is a valuable educational tool that belongs in every school science class and lab.—FRANKLIN N. TESSLER

RATING: ★★★

PROS: Easy to use; interchangeable lenses.

CONS: Doesn't yet support OS X; requires separate application to capture images.

PRICE: \$229

OS COMPATIBILITY: Mac OS 9

COMPANY: Scalar, 877/611-2688, www.drbott.com

MAYA FOR MAC OS X 3.5.1

***; Alias|Wavefront, 800/447-2542, www.aw.sgi.com; \$1,999; upgrade from version 3.5, free

When we reviewed Alias|Wavefront's Maya for Mac OS X 3.5 (Reviews, January 2002), we found a number of serious problems with OS X compatibility, and we advised potential users to wait for this update. Version 3.5.1, which shipped in late December, fulfills its promise of bringing fast, stable performance to OS X 10.1 and later.

Maya for Mac OS X 3.5.1 runs smoothly on all current graphics cards with ATI and Nvidia chip sets, and OpenGL performance is now much improved. Furthermore, the program's many tools that rely on Wacom pressure-sensitive tablets are now fully functional, and painting and sculpting with a tablet are pleasurable tasks. We highly recommend Maya for Mac OS X in its current form.—SEAN WAGSTAFF

TOON BOOM STUDIO 1.1

***; Toon Boom Technologies, 514/278-8666, www.toonboomstudio.com; \$375; upgrade, free

We've already reported that Toon Boom Studio 1.0 excels at creating vector-based Flash animation (Reviews, March 2002)—this free upgrade beefs up the program's pixel power. Toon Boom Studio 1.1 works with iMovie, letting you export movies created with Toon Boom into preexisting or new iMovie projects. And your movie's audio doesn't get left behind when you export to QuickTime format, as occurred with Toon Boom Studio 1.0.

Toon Boom Studio's interface has also been significantly overhauled; gone is the plethora of tool palettes, replaced by customizable toolbars in the main windows, Drawing and Sceneplanning. These toolbars work exactly as the one in OS X's Finder windows does, with a special customizing screen that lets you drag premade icons into and out of the toolbar. This welcome face-lift further integrates Toon Boom Studio into OS X.—GALEN FOTT

EZEDIAMX 3.0

***; eZedia, 877/408-0195, www.ezedia.com; \$240

If you're looking for a quick, relatively hassle-free way to infuse humdrum business presentations or school assignments with interconnected text, sound, graphics, and movies—including virtual reality and animation—eZediaMX 3.0 is worth a look. It runs in OS 9 and OS X, and its drag-and-drop environment is both practical and intuitive. You generate your creations one frame at a time, and you rely on the program's Objects buttons to incorporate text and graphics, link

to a movie or sound file, and set up navigation between frames. At any time, you can preview your project in the program's Run mode and export it to popular file formats such as QuickTime. Helpful PDF tutorials guide you through basic functions.

While eZediaMX boasts cross-platform capability and a slew of new and enhanced features, it doesn't quite hit the mark when it comes to OS X; the tutorials assume you're using OS X but show some OS 9 screenshots, and the dialog box that's supposed to let you apply transitional effects doesn't load in OS X.

eZediaMX's ease of use comes at a relatively high price. Newcomers should consider just how much they're willing to pay to generate interactive family trees, spice up their marketing presentations, and enhance their children's social studies homework.—JILL ROTER

EX-TEND-IT DVI TO ADC

***; Gefen, 800/545-6900, www.gefen.com; \$200

DVIATOR FOR ADC

***; Dr. Bott, 877/611-2688, www.drbott.com; \$150

You're drooling over Apple's flat-panel monitors—and with good reason: they're some of the best-designed displays around (see "Macworld's Ultimate Buyers' Guide: Monitors," February 2002), and unlike 90 percent of the displays out there, their ADC connectors unify power, USB, and the video signal in one cable. But if your Mac's video card includes a DVI output, it's been incompatible with these ADC monitors—until now. Dr. Bott's DVIator for ADC and Gefen's Ex-extend-it DVI to ADC adapters turn an ADC signal from your monitor into a DVI signal your computer can use, and they both do a fine job. Until someone makes an ADC video card for the Mac, using one of these adapters is the way to go.

Each product includes a large (and heavy) power brick, appropriate cables, and a device that converts the signal. The Ex-extend-it uses a small conversion box with USB and DVI inputs along one side and ADC and power inputs along the opposite side. The DVIator comes with a cluster of cables that adapt the signal, but they also make the connection more confusing than the Ex-extend-it's compact box.

Setup is simple for both products, and display quality with either of these adapters is just as crisp and clear as with an ADC video card. However, those who want to use an ADC monitor because it promises to reduce cable clutter may find that the tangle of additional cables and numerous parts spawned by these adapters only exacerbates the problem.—JENNIFER BERGER

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Choose 91 at www.macworld.com/getinfo

Civilization III, 4x4 Evolution 2, RealMyst, Icewind Dale

Diplomacy, Dodges, Dragons

THIS MONTH I BRING YOU A VERITABLE POTPOURRI OF game offerings from the far corners of the world. For would-be emperors, there's Civilization III. For off-road-racing enthusiasts, 4x4 Evolution 2

puts you at the wheel. For fans of old-school adventure puzzle games who are looking for something with a fresh twist, there's RealMyst. And for role-playing aficionados, Icewind Dale serves up an icy adventure.

Rule the World in an Afternoon?

Following up one of the most well-loved turn-based strategy games in the history of computer entertainment is a daunting task—just ask the creators of the anemic Civilization:

Call to Power. But Firaxis Games teamed up with Sid Meier (the original creator of the Civilization series) to give it a try, and the results are superb. The new installment of the series is deeper than its predecessor but easier to play.

With Civ III, you're once again thrust into the role of leader of a civilization, and you must transform your tribe of Stone Age hunter-gatherers into a thriving, modern civilization. It's easier said than done. Finding the right place to establish your civilization is one problem—a lack of natural resources can stifle the growth of your people. Finding the right balance of technological and social development and correctly combining diplomacy and military power can be an even greater challenge—and that's where the real meat of this title is.

As you start the game, you decide which tribe you're going to try to raise up into a world-building civilization. You have more than a dozen to choose from, including Rome, Greece, Germany, China, Japan, and India. The tribe you choose will determine what qualities your civilization has. The Romans are industrious and militaristic, for example, while the Babylonians favor religion and science. The Chinese emphasize industry and science, and they excel in areas such as bronze-working and masonry.

As you continue the game, you develop various aspects of your people's culture and their techno-



Build Your Own Empire Laying out cities, creating trade routes, developing technology, managing diplomatic relations, and fighting wars—it's all in Civilization III.

logical understanding of the world. You must help them accumulate research to make your civilization grow, especially if you want to see it move out of the Stone Age and into modern times. To that end, you guide your Science Advisor toward the areas of research you deem important.

You also have to maintain diplomacy and trade with neighboring civilizations, which can help you in your ascension by giving you—for a price—certain

technologies or information that your own people would otherwise spend inordinate amounts of time trying to discover themselves. It can certainly be a handy way of advancing, but it's also potentially dangerous—a particularly covetous civilization next door could decide to wage war, or sabotage, or steal.

Civ III differs from Civ II in a few key areas. Most notably, there's no multiplayer mode. I don't think the game is diminished without it, since I found multiplayer rounds of Civ II to be tiresome and slow, and altogether not in the spirit of the game. Regardless, many gamers may be disappointed that they won't be able to compete against each other.

Civ III also features a more streamlined interface that's easier to control, and here's where I think the game succeeds best. With all the praise I heaped upon Civ II, I never mentioned ease of use. The game was difficult—even daunting—to learn how to play effectively, and Civ III's designers have taken great pains to make this version easier to play.

Civilization veterans should be able to hop in and get started right away, and a tutorial mode will help neophyte civilization builders who have never played a Civ title before. Also handy for all Civ players is the Civilopedia, a handy in-game reference guide that explains just about everything in the Civilization world.

Civ III is easier to play than its predecessor.

>>



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<< I'm still waiting for MacSoft, the game's publisher, to fix a few blemishes—bugs that involve sound, for example—as we go to press, but the release of one major patch has already fixed many problems.

Riding in the Muck

Racing games for the Mac are so rare that you might want to overlook any problems they have. 4x4 Evolution 2 has its share of problems, and some of them are not so easy to overlook.

In 4x4 Evo 2, you race off-road trucks and SUVs—simulations of dozens of real-world models—over a variety of terrains, against computer-controlled or online opponents. Online games are hosted through a built-in GameSpy client, which connects to Terminal Reality's multiplayer server. It was tough for me to find online opponents to play against, even though the title supports games between Macs and PCs.

In the game's Career mode, you run races for money. You then buy items to customize your vehicle, such as improved

In 4x4 Evo 2, you race off-road vehicles over a variety of terrains.

engine parts, beefier tires, and mud flaps. If you win enough money, you can also buy new vehicles. As you win more races and series, you'll eventually gain the attention of teams, and joining those teams will give you access to special auto parts and race vehicles. You can also go on missions to earn money without racing—for instance, you may be required to deliver supplies to a remote village.

If you just want to check out the tracks before you race, you can go into Free Roam mode. Hot Lap mode pits you against a double of yourself so you can try to beat your own best time. Quick Race mode lets you test out any truck and track, and you can even tweak weather conditions and the time of day.

The game's computer-controlled opponents are, in a word, morons. Their path-finding capabilities are



Eat My Dust In 4x4 Evolution 2, you race off-road against computer- or human-controlled opponents. You also win races and buy parts to install on your truck, a simulation of a real-world vehicle.

poor, and more than once I saw them smashing into one another nonstop, in some bizarre off-road-truck variation on the pig pile.

Graphics are similar to those of the first 4x4 Evo game, and you can adjust them to speed up performance. Physics are supposedly realistic, but the whole game feels a bit low-gravity to me, as did its predecessor—trucks have a tendency to bounce around and spend a lot of time in the air.

Damage modeling—the appearance of actual damage to vehicles as they smash into each other, trains, buildings, and objects in the road—is nonexistent.

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ns.

4x4 Evo 2 depends on licensing the designs of real-world trucks, and the manufacturers involved don't want depictions of their machines being banged up or destroyed. This is understandable, I guess, but in a title that otherwise values realism, it's a flaw.

Old and New

Back when *Myst* was first introduced, 3-D graphics acceleration was still largely relegated to the high-end workstation market. In its original incarnation, *Myst* used snapshots to depict its lush 3-D scenery. Move a step, and the screen would show you a new image. Fast-forward to today, when 3-D graphics acceleration is ubiquitous, from the slowest iMac to the fastest Power Mac G4. *Myst*'s original developer, Cyan, has revisited its landmark 3-D adventure puzzle game, this time crafting

Cyan lets you revisit Myst—
with a real-time 3-D engine.

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This Time in Real Time RealMyst is the same classic adventure puzzle game as *Myst*, but this time you can explore it the way the developers originally envisioned.

<< the world the way it originally intended: using a real-time 3-D engine.

Yes, it's still *Myst*—there's no death match between Sirrus and Achenar here; instead, you spend time solving puzzles and exploring. And if you've already made it through *Myst* and are looking for new challenges, there's not much point in playing *RealMyst*. Most of the puzzles are the same, though the game ends with a new age that contains a few new puzzles; the new ending ties this game more closely to its sequel, *Riven*, than the original's did.

Using a simple interface that launches when you start the game, you can adjust detail level and resolution. The 3-D engine works well enough to create more of a sense of "being there" than the HyperCard-derived slide-show engine did in the game's original form—there's fine attention to detail, such as debris caught in the wind, birds flying, and water lapping in waves.

Unfortunately, the 3-D engine is also pretty slow and clunky. Moving around is imprecise, and you may need to hurtle yourself at objects that you want to grab and manipulate, drunkenly staggering around *Myst*'s environments. But once you've located a puzzle, you lock on to it just as you did in the original, so manipulating the puzzles is easier.

RealMyst is a valiant attempt to resurrect *Myst* and make it relevant to today's audiences. If *Myst*'s slide-show-style presentation turned you off and kept you from playing the game, this may be the excuse you need to give it a try. Ultimately, though, *RealMyst* is more of a novelty for dyed-in-the-wool *Myst* fans than an intriguing title for folks who haven't already played the game.

Face Your Demons

MacPlay's latest role-playing game has some impeccable credentials. Originally crafted by Interplay's Black Isle Studios and based on the *Baldur's Gate* engine developed by BioWare, *Icewind Dale* was released for the PC before *Baldur's Gate II* hit the shelves. This role-playing adventure is set in the same *Forgotten Realms* as the *Baldur's Gate* games. It's a brand-new experience, though, as gamers travel to

(and under) the cold, forbidding Spine of the World—a frozen range of mountains.

If you have any experience with the *Baldur's Gate* games, you'll be right at home here; the interface is identical, and the graphics are similar. The adventure itself is set in a fantasy realm where swordplay and sorcery are as commonplace as the nightmarish creatures that seem to dwell in every darkened corner of this game.

Icewind Dale puts you in charge of a party with as many as six adventurers. You create the characters, each with specific skills and attributes. You equip them with items both magic and mundane—everything from potions to weapons to armor—and attempt to keep them alive as they complete quests and face an endless onslaught of monsters. As in any epic fantasy yarn, your adventurers go to many exotic locations, meet many exotic creatures, and kill many of them for fun, experience, and profit.

Speaking of endless onslaughts, it's worth noting that *Icewind Dale* features a huge amount of combat. There's a lot of

Combat is where it's at in *Icewind Dale*.

storytelling, and there are twists and turns that are affected by the characters in your party and by your interactions with non-player characters. But combat is where it's at in this game.

Icewind Dale has much in common under the hood with the original *Baldur's Gate* game—many interface panels and some graphics are the same. Fortunately, my experience with it was not as fraught

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<< with problems as my time spent playing the Mac release of Baldur's Gate was.

It's easy to get frustrated early with Icewind Dale, especially if you're not intimately familiar with the other games that BioWare and Black Isle Studios have crafted. Right off the bat, my party was slaughtered as I sought the right balance of characters and attributes and tried to figure out various techniques for making sure they were put to good use. For example, I quickly discovered that it was a bad idea to arm Magnus Ravenclaw, my noble but physically weak magic user, with nothing more than a quarterstaff and then pit him against a slobbering ogre in hand-to-hand combat—especially when Xena, the burly human fighter, might sooner dispatch the foul beast with a few quick snaps of her broadsword. Fortu-



Fantastic Fantasy Gaming Icewind Dale provides a classic and authentic "dungeon crawl" adventure game that follows Advanced Dungeons & Dragons rules.

CIVILIZATION III

RATING: ★★★★★

PROS: Easy for beginners to learn; deep and rewarding game play.

CONS: Sound glitches; no multiplayer mode.

PRICE: \$50

OS COMPATIBILITY: Mac OS 9, Mac OS X

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

4X4 EVOLUTION 2

RATING: ★★★★★

PROS: Hey, it's an off-road-racing game for the Mac!

CONS: No damage modeling; idiotic competition.

PRICE: \$40

OS COMPATIBILITY: Mac OS 9, Mac OS X

COMPANY: Aspyr Media, 512/708-8100, www.aspyr.com

REALMYST

RATING: ★★★★★

PROS: Myst the way it was intended to be.

CONS: Clunky 3-D engine; few new challenges.

PRICE: \$30

OS COMPATIBILITY: Mac OS 9

COMPANY: MacPlay, 214/855-5955, www.macplay.com

ICEWIND DALE

RATING: ★★★★★

PROS: Huge dungeon crawl; a lot to see and kill.

CONS: Tough learning curve.

PRICE: \$50

OS COMPATIBILITY: Mac OS 9

COMPANY: MacPlay, 214/855-5955, www.macplay.com

nately, Icewind Dale lets you restore from saved games, so you can repeat events—and perhaps achieve a more positive outcome—before continuing.

Of course, it can be argued that half the fun of playing a role-playing adventure game is doing it with friends—anyone who has spent a Saturday evening playing dice-and-paper adventure games can attest to that. Here, Icewind Dale doesn't cheat you. The game features TCP/IP-based multiplayer gaming, so you and other Icewind Dale users on the Internet can go goblin hunting together. You can join or host a game from within the Icewind Dale interface. And a plug-in is available in case you'd prefer to use the popular and free online Mac gaming service GameRanger instead.

Macworld's Buying Advice

If strategy games are your thing, you'll be hard-pressed to find a better value than Civilization III this season, despite the game's warts. Off-road-racing games are rare on the Mac, so 4x4 Evolution 2 is an option, though not a particularly compelling one. And if you've been looking for an excuse to try Myst but just haven't found it yet, RealMyst might be the reason you've been waiting for. And finally, if you want to lose yourself for hours in an engrossing role-playing game—and you've already played Baldur's Gate II—you should consider giving Icewind Dale a try. □

Since getting the bill for having his Aerostar towed out of a ditch, MacCentral.com senior editor PETER COHEN restricts his off-road adventures to the Mac.

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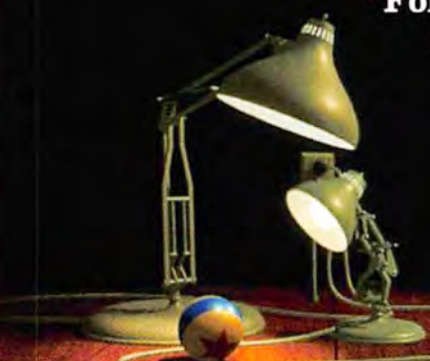
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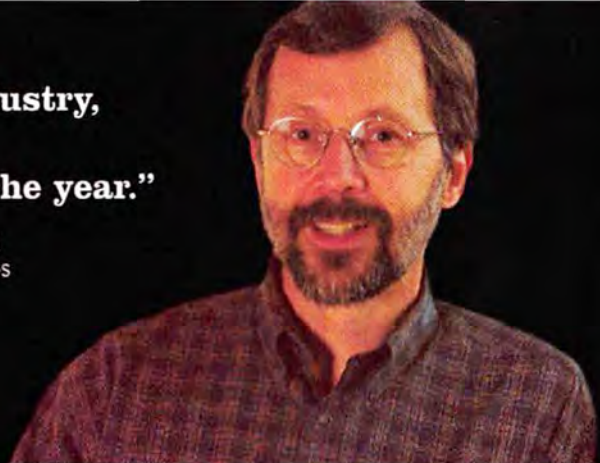
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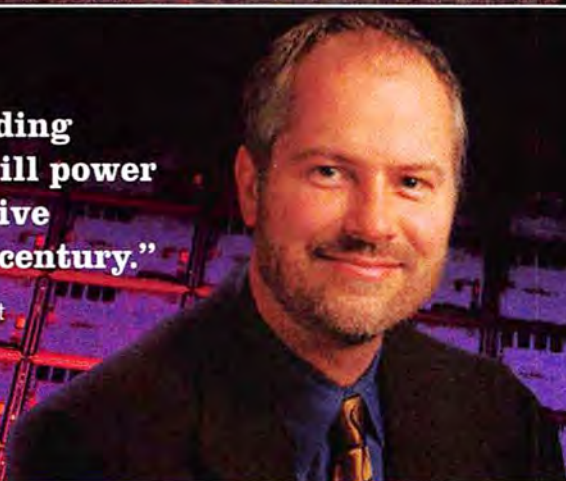
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FOCUS ON DIGITAL VIDEO

FROM THE INCREASING NUMBER OF LOW-COST, HIGH-QUALITY DIGITAL CAMCORDERS to the growth of Apple's Final Cut Pro video-editing software, Mac users have better access to powerful digital-video tools than they've ever had before. This special supplement from the editors of *Macworld* highlights the latest generation of video-capture tools and gives you pointers on using Final Cut Pro 3 efficiently.

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GET BETTER VIDEO IN LESS TIME **p. 66**

LIGHTS, CAMCORDER, ACTION

BY JEFF PITTELKAU

Lower Prices, Added Features
Boost Digital Camcorders' Appeal
for Mac Moviemakers

For more than two years, Apple has touted the Mac as the ideal tool for creating your own videos. This is more than just marketing hype. With the latest releases of iMovie, iDVD, and Final Cut Pro—and now DVD Studio Pro (see “DV to DVD”)—video editing on the Mac has never been easier. And Mac-using video editors have never been more productive, whether they're creating DVDs for clients or producing home movies.

But before you can become a digital-video auteur, there's one essential piece of equipment you need: a DV camcorder. If you've been holding off on diving into digital video because of the prohibitively high cost of cameras, your wait is over.

Every camcorder maker has cut prices across the board this year, ushering digital video into the mainstream. For as little as \$600—maybe less if you shop around—you can get a basic MiniDV camcorder with FireWire connectivity. Even with the recent price increases for Apple's new iMac models—which start at \$1,399—you can be up and running with a complete DV editing system for less than two grand.

How Low Can They Go?

Among the most notable price cuts in 2002 are revised prices for models previously reviewed in *Macworld* (Reviews, December 2001). The new ZR line from Canon (800/652-2666, www.canondv.com)—which includes the ZR40 (\$699), ZR45MC (\$799), and ZR50MC (\$899)—includes cameras that cost \$100 less than the models they replace. But these cameras offer more than just price cuts; they also sport several feature enhancements, such as new case designs, more-durable port covers, and a low-light shooting mode.

In contrast, Sony (800/571-7669, www.sony.com) put its DCR-TRV17 on a feature diet. The company reduced the size of that model's LCD monitor from 3.5 inches to 2.5 inches and created the DCR-TRV18, which costs \$800—\$300 less than its predecessor. Meanwhile, the

latest entry-level model from Panasonic (800/211-7262, www.panasonic.com), the PV-DV52, is one of the first DV camcorders to hit the new low-price benchmark of \$600.

Another player in the DV-camcorder marketplace is Sharp (800/237-4277, www.sharp-usa.com), which recently introduced three new Digital Viewcam models, the VL-NZ50U (\$600), VL-NZ100U (\$700), and VL-NZ150U (\$800). These models feature Sharp's unique Viewcam design, which incorporates a split, rotating body styled more like a digital camera than a camcorder.

Image Is Everything

Another big change in digital camcorders is the nearly ubiquitous adoption of still-image capture to some kind of memory card. Many midrange models, such as the new GR-DVL725U from JVC (\$900; 800/526-5308, www.jvc.com), feature high-resolution CCD chips capable of capturing more detail in still images than is allowed by the MiniDV tape format. High-end models, such as Sony's DCR-TRV50 (\$1,600) and Canon's Optura 100MC (\$1,899), go as high as 1.5 megapixels and include pop-up flashes, making them every bit as good as a comparable still-image camera. At press time, Sony had announced the 17-ounce DCR-PC101 (\$1,300), a 1-megapixel camera and digital camcorder combination that's the smallest of all Sony MiniDV models.

Many of the new hybrid camcorders include USB ports for still-image capture to a PC. While you might think that these ports would work just fine with a Mac, at press time only Sony would go on record claiming that its models were Mac compatible. For incompatible models, you'll need a USB card reader, such as the \$23 SecureMate, from SanDisk (800/977-5427, www.sandisk.com).

As if stills weren't enough, many of these hybrid camcorders can capture low-resolution video in the MPEG-4 format and store it on the camcorder's memory card. This feature will be more interesting to Mac users after the release

of QuickTime 6, which features full MPEG-4 support for creating and viewing streaming video at lower bit rates that require less bandwidth.

For Pros and Prosumers

Two principal features define a professional DV camcorder: CCD chips and stability. For higher-fidelity color and better image quality, three CCD chips—one each for sensing the red, green, and blue components of a video image—are a must. To reduce the shakes that are inevitable when shooting without a tripod, optical image stabilization does a much better job than the digital systems used in consumer camcorders. Models with these high-end features are now more affordable and feature-rich than last year's models.

Panasonic's latest three-chip model, the \$2,300 PV-DV952, costs \$200 less than its predecessor, the PV-DV951. Still, it includes a number of improvements, such as a pop-up flash, remote control, and zoom microphone. If you shoot scenes that include computer monitors, you'll appreciate Clear Scan, one of the many new features in Canon's upgrade to the XL1, the XL1S (\$4,699). This special shooting mode is adjustable to match the refresh rate of computer monitors for flicker-free recording.

And if you're looking for a three-chip camera that can do video streaming, consider JVC's GY-DV300 with its optional KA-DV300 network adapter. The \$4,294 combination features a built-in Web server for streaming video that also allows you to control the camcorder from any Web browser. Sony has recently announced the DCR-TRV950 (\$2,500), which it bills as the industry's first three-CCD camcorder with one megapixel for each chip.

Look Ma, No Wires

If you're wondering whether Apple's decision to add Bluetooth support to Mac OS X will impact digital video (see "True Blue," *Mac Beat*, elsewhere in this issue), you may be interested to know that Sony has introduced a number of camcorders that support this wireless connection interface. Sony offers three MiniDV models with Bluetooth—the DCR-PC120BT (\$2,000), the DCR-TRV950, and the DCR-TRV50. Since Apple's support of Bluetooth is nothing more than a technology preview at this point, it may take some time before your Mac fully supports these models. Still, it's nice to dream.

What to Look For

With nearly 100 different digital camcorder models available at any given time, how do you decide which one is right for you? Here are things to look for when you're shopping for a camcorder.

Compatibility

Generally, most MiniDV and Digital8 camcorders that include an IEEE-1394 port—commonly referred to as a FireWire or i.Link DV—will work with a Mac. However, there may be a few glitches, such as incomplete support for tape control from within iMovie. Apple maintains a database of models it has tested at www.apple.com/imovie/compatibility.html. This list is often out-of-date, but that's not necessarily a bad thing—discontinued models can often be had at deep discounts.

CCDs

Consumer models use a single CCD; professional models use three. Commonly called three-chip camcorders, these models capture the best color, which is critical if you're shooting a music video or the evening news. But if you're just recording a Little League game or a recital, a single-chip model is fine. Just remember that the same rule that applies to digital cameras applies to camcorders: the more pixels, the sharper the images.

Zoom

Optical zoom moves components in the lens assembly to focus on a larger or smaller area, giving you the full resolving capability throughout the zoom range. Digital zoom magnifies a small portion of the recorded image, which results in a pretty much unusable image. For this reason, when comparing camera models, you should focus on optical zoom ratings.

Microphones

Camcorders with built-in microphones on the front generally record better sound than camcorders with microphones on the top. However, microphones in all consumer-grade camcorders aren't that great. You'll record much better sound if you invest in a zoom microphone—standard equipment on professional camcorders—that can vary its sensitivity in tandem with your camcorder's zoom lens. You can pick up a microphone for around \$100.

Low-Light Recording

The DV format can record incredible sharpness and color, provided you're recording a scene that's strongly illuminated. For dim-light recording, many models now include amplification circuitry to capture a halfway decent image. But for best results, you can't beat an add-on light, also about \$100.



Direct to Video JVC's professional-grade GY-DV300 with a KA-DV300 network adapter (\$4,294 for the set) features a built-in Web video server.



Studio Audience You can use Formac's \$399 Studio DV/TV to watch TV—or capture standard video from an analog VCR or a Mac-incompatible camcorder.



Pro Production Panasonic's \$2,300 PV-DV952 features an optical image stabilizer and three CCDs, but it costs \$200 less than its predecessor.

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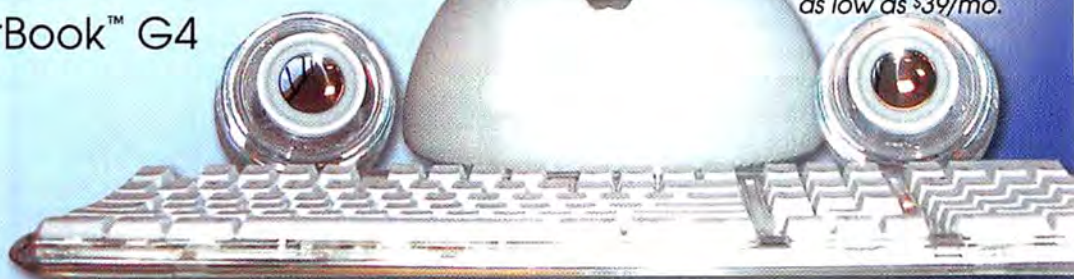
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Alternative Formats

Speaking of dreams, two new formats are now appearing in digital-video camcorders. Neither works with a Mac, but they're worth noting if for no other reason than they meet two consumer needs: size and speed.

On the size front, Sony has introduced a new tape format called MicroMV, which records digitally in MPEG-2 format to tiny cassettes. The small size of MicroMV tapes allows for camcorders that really do fit in a shirt pocket. The first two models to be released are the DCR-IP5 (\$1,300) and the Bluetooth-enabled DCR-IP7BT (\$1,700).

If you just can't wait to edit and view your video, you might want to consider a camcorder that records to DVD-RAM, which offers random-access capability not available to tape-based camcorders. Panasonic and Hitachi are the only players in this game, but both offer products that, unfortunately, aren't compatible with a Mac. Still, the latest models from Hitachi (800/448-2244, www.hitachi.com)—the DZ-MV200A (\$900), DZ-MV230A (\$1,000), and DZ-MV270A (\$1,300)—have relatively low prices and can record directly to DVD-R media, which can be played in home DVD players. If you're desperate to have a camera that supports the MicroMV or DVD-RAM formats, you can connect the analog video outputs to a Mac-compatible FireWire video encoder, such as the \$399 Studio DV/TV, from Formac (877/436-7622, www.formac.com).

One alternative format that does work with a Mac is Sony's Digital8, which uses standard 8mm videocassettes to record in the DV format. These camcorders are bulkier than their MiniDV counterparts, but they cost less. Sony's latest entry-level model, the DCR-TRV140, sells for only \$500. Digital8's winning advantage is its ability to play back analog tapes recorded by older 8mm camcorders.

What's Next?

Considering that many of this year's low-priced camcorders came about as the result of feature trade-offs, \$500 may be about as low as you'll be able to go. What's in store for next year? You can expect to see some of the features found in midrange camcorders—such as high-resolution stills—appear in entry-level models. And keep an eye on the format wars, to see if either DVD-RAM or MicroMV will become noteworthy enough to deserve Apple's attention—and support. □

JEFF PITTELKAU, former Macworld Lab director, is a freelance writer covering Mac products and technology.



Low Light, Lower Price Canon's ZR45MC is an improvement on the ZR25MC, offering low-light capability and a \$100 lower list price.



Am I Blue? Only time will tell whether Sony's Bluetooth-enabled DCR-PC120BT plays nicely with Apple's new Bluetooth implementation.



Candid Camcorder With list prices ranging from \$600 to \$800, Sharp's Digital Viewcam models offer cameracompact simplicity.

DV to DVD

DVD Studio Pro 1.5 Provides OS X Support and Improved Integration with Final Cut Pro

While DV-camcorder manufacturers cut prices and add features to movie-making hardware, Apple (800/692-7753, www.apple.com) is busy updating the software you'll need to create eye-catching videos and DVDs. In the past year, Apple has released updates to iMovie, iDVD, and Final Cut Pro, adding OS X compatibility and other enhancements. The latest video tool to undergo a revision is Apple's DVD-authoring program, DVD Studio Pro.

Unlike the entry-level iDVD, DVD Studio Pro is a professional tool for producing full-featured DVDs—you can create DVDs containing more than two hours of high-quality video per disc with as many as 99 separate tracks.

With DVD Studio Pro 1.5, Apple adds support for OS X. That means more than just an Aqua-fied interface for the DVD-authoring program. Apple says OS X compatibility will add greater stability while letting the QuickTime MPEG-2 codec included with DVD Studio Pro encode MPEG video and compile products in the background.

In addition to OS X compatibility, the updated DVD Studio Pro features better integration with Final Cut Pro 3, Apple's digital video-editing software. Users can set chapter markers in Final Cut that are automatically carried over to DVD Studio Pro.

DVD Studio Pro 1.5 comes bundled with the Bias Peak DV audio editing software and Corel Photo-Paint. The addition of the graphic editing software addresses a need with the original DVD Studio Pro, which required users to turn to a separate program such as Adobe Photoshop to create interface elements for their DVDs.

The DVD-authoring software sells for \$999. Existing users can upgrade for \$199.

If you shoot and finish your work with 35mm and 16mm film but want the cost and time benefits of digital editing, Apple offers Cinema Tools for Final Cut Pro. The new program enhances Final Cut's 24 frames-per-second editing capabilities, adding support for film cut lists and 24-frame edit-decision lists for high-definition video. The \$999 Cinema Tools, which is slated to ship in May, incorporates some of the technology used in FilmLogic; Apple bought FilmLogic maker Focal Point Systems in 2001.—PHILIP MICHAELS

GET BETTER VIDEO IN LESS TIME

BY ANTON LINECKER

You Can Speed Up Your Final Cut Pro Routines with These Easy Shortcuts and Add-Ons

One of Final Cut Pro 3's big benefits is that it lets you edit in real time—you don't need to wait for effects to render before previewing them. But if you have a G3 or a slower G4, you don't reap the benefits of real time. Editing more efficiently, however, can often speed up the process far more than working on a powerhouse machine.

The Right Setup

If your Mac can handle it—all but iBooks and iMacs can—you should use a second display with Final Cut Pro. More screen real estate means more efficient editing.

You're best off setting up your editing space so you can see everything you need at once and minimize searching and scrolling. You may want to have the Browser window take up an entire screen, for example. That way you can quickly access the clips you need. Your timeline will also have more space, so you'll be able to see more of your edit.

Final Cut Pro 3 has nine preset window arrangements when you are working with two monitors, including the new Three Up (see "Custom Layout"). Each layout is tailored for different edit scenarios. For example, you may choose the Dual Screen: Editing template for most of your work, and change over to Dual Screen: Three Up for color correction. Single-monitor users will see only six of the nine presets.

If you don't find an arrangement that fits your needs exactly, you can also customize and save your own window placements. To do this, first set up the window as desired. Then hold down the option key and choose Window: Arrange. Two custom settings are available. Choose Set Custom Layout 1. Repeat the process to create a second window arrangement. When you're done, you can call up your customized settings by typing shift-U for Custom

Layout 1 and option-U for Custom Layout 2. Control-U gets you back to the standard layout.

The Right Keys

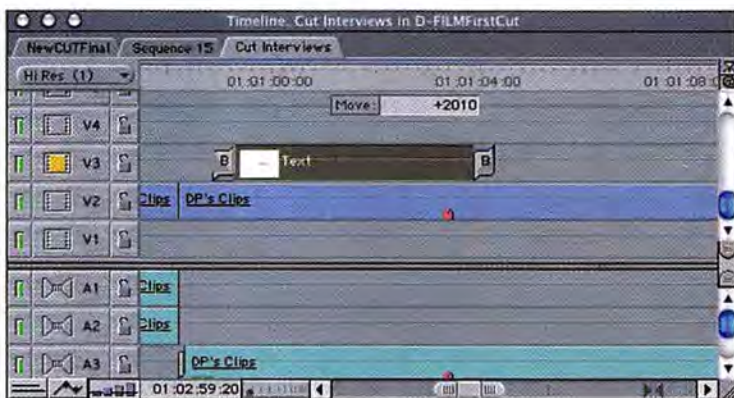
Keyboard shortcuts are the easiest way to increase your editing speed; you can perform practically anything in Final Cut Pro with simple keystrokes. Why drag something from one window to another when you can paste it instantly with a single keystroke? (And don't forget that substituting keyboard commands for mouse movements can help reduce or prevent repetitive strain injuries as well.)

Even though there are tons of keyboard shortcuts in Final Cut Pro—and it would be difficult for anyone to know them all—once you learn them, they'll feel as automatic as riding a bicycle.

Some keystrokes are universal, while others are specific to the area of the program you're working on (Log And Capture or Editing, for example). For a list of the most-useful keyboard shortcuts for Final Cut Pro 3, see "Fancy Fingertwork." Be aware that some of the shortcuts have changed since version 2.

Edit by Number

You can navigate through Final Cut Pro and edit efficiently with a little number magic. If you want to go to hour 2 of your cut, for example, simply



Clip on the Run By selecting a clip and typing numbers into the Move box, you can precisely control the location of your clip without clicking and dragging.

Fancy Fingerwork

GENERAL AND NAVIGATION

⌘-E	Start a new project.
⌘-N	Start a new sequence.
⌘-1	Activate the Viewer window.
⌘-2	Activate the Canvas window.
⌘-3	Go to the timeline.
⌘-0 (zero)	Open sequence settings so you can modify the sequence you're working on.
option-Q	Load Preferences panel so you can change scratch disks and other options.

LOGGING AND CAPTURING

⌘-8	Bring up Log And Capture window.
tab	Advance text fields when you're logging.
shift-tab	Jump back text fields.
F2	Log clip. With log prompt engaged, FCP will open a window asking you to name the clip. With the log prompt turned off, you fill in the clip-info fields and pressing F2 puts the clip in the browser as an offline clip.
control-C	Engage Batch Capture function.
shift-C	Capture now.

PLAYING VIDEO

spacebar	Play and stop.
L	Play forward. Press L twice to play video at double speed. Press L three times to play video at triple speed.
J	Play reverse. Press J twice to play video in reverse at double speed. Press J three times to play video in reverse at triple speed.
K	Stop. Hold down K and press L to advance one video frame. Hold down K and press J to back up one frame.

EDITING

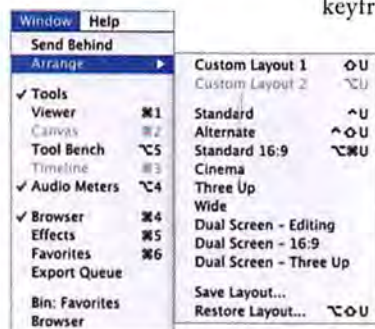
shift-T	If you want to enlarge the size of your timeline tracks vertically, use this command to cycle through four track sizes.
shift-Z	See your whole project at once. This shrinks the entire sequence to fit your timeline.
⌘-plus sign (+)	Zoom in (in the Viewer or Canvas window) and expand the sequence (in the Timeline).
⌘-minus sign (-)	Zoom out (in the Viewer or Canvas window) and shrink the sequence (in the Timeline).
control-option-X	Open Boris Title 3D (FCP 3 only).
control-X	Open the traditional text generator and titler.
I/O	I for in-point, O for out-point.
option-I/O	I to clear the respective in-point, O to clear the respective out-point.
T	Press T once to choose the Select Track Forward tool. With it, you can highlight all the video clips and the corresponding audio on a certain track from the pointer forward. Press shift-T to select all the tracks forward. Press T twice for the Select Track Backward tool. Press T three times for the Select Track Tool. With it, you can select the entire contents of a track.
F	Activate the Match Frame function.
N	Turn snapping on and off. You can also do this by clicking on the top right corner of the timeline (above the linked icon).
A	Change to the Arrow tool.
B	Change to the Razor Blade tool.
R	Change to the Rolling Edit tool.
⌘-C	Copy. When you choose a clip and copy it, you copy not only the slice of media but also the filters and other attributes associated with the clip.
⌘-V	Paste the whole clip, as is, into the timeline.
option-V	Paste only the attributes of a clip into another clip. When you select this command, a window will prompt you to choose exactly which attributes you want to apply. So if you want to paste a color-correction filter from one clip to the other, choose this function. If you want to paste a color correction but not a motion effect, you can separate the two attributes.
up arrow and down arrow	In the timeline, the up and down arrows transport you from edit to edit. In the browser, the up and down arrows let you navigate through the clips; press return, and the chosen clip loads into the Viewer.
F6	Target your video track. If you have more than one video track, press F6 then type the track number.
F7 and F8	Set your target audio tracks.
shift-F6, shift-F7, shift-F8	Turn off the target tracks.
F9 and F10	These keys are for editing double barrel: insert and overwrite, respectively.
shift-F9, shift-F10	Insert and overwrite with a transition.
delete	Delete any highlighted item. In the timeline, it removes media between the in and out points, leaving a gap if no clip is highlighted.
shift-delete and forward-delete (on extended keyboard only)	Ripple delete. Removes unwanted media and then ripples the edit points, leaving no gap.



Colorful Keys Post-Op Video's P-Series Final Cut Pro EZ Keyboard is a labeled and color-coded input device for simplifying your Final Cut Pro experience.



Space Shuttle Contour Design's ShuttlePro—like traditional editing devices—has a jog/shuttle wheel and 13 keys that you can assign functions to; it now comes with drivers for use in OS X.



Custom Layout Final Cut Pro 3's Arrange menu lets you choose from many preset window arrangements, including setups for dual screens. You can also save and access two custom layouts.

choose the timeline (or canvas), type **2000000**, and press enter. You don't need to type the timecode colons or semicolons. You don't need to type into the Current Timecode window. In fact, you don't really need to type all those zeros, because Final Cut Pro even has a shortcut for that. If you type a period, Final Cut Pro interprets that as two zeros. So the fastest way to get to hour 2 is to type **2...** (three periods) and press enter.

It's even easier to move within the same hour. Just type the numbers that differ from your current location. Let's say your playhead is at 01:20:13:09. To move to 01:20:37:15, type **3715** and press enter. Make sure the Current Timecode field isn't selected—otherwise the playhead will move to 00:00:37:15.

You can also move relative to the current frame. If you press the plus key (+) and then type **1206**, your playhead will advance 12 seconds and 6 frames from the current position. Press the minus key (-) and **625**, and your playhead will go 6 seconds and 25 frames back. You can move clips in this way as well. If you highlight a clip and press plus, then type **2010**, the clip will move forward 20 seconds and 10 frames (see "Clip on the Run"). If you move the clip backward in the timeline, Final Cut Pro will prevent you from overwriting existing media.

When you're editing, you can modify clips and transitions easily from the timeline. If you want to modify a clip's length and speed, for example, hold down the control key and select the clip. A set of shortcut menus will appear. Choose Duration, and the Duration window will appear. Type in the new duration. Similarly, if you choose a transition (with the control key held down), you can change its duration.

Editing with Precision

When you drag to adjust an edit point, a keyframe, or a clip position, Final Cut Pro often makes these changes as coarse adjustments—moving your clip in jumps of three frames, for example. You can make fine adjustments with the **⌘** key. For instance, hold down the **⌘** key after you start moving your clip, and Final Cut Pro slows the clip's motion so you can make frame-by-frame adjustments (providing, of course, that you've turned snapping off—which you can do quickly by pressing the **N** key).

Similarly, you can make fine adjustments when you're changing sound levels and keyframe parameters by using the **⌘** key in the same fashion.

Peripheral Power

A number of hardware products out there can make editing with Final Cut Pro much easier. If memorizing keyboard commands isn't for you, Post-Op Video makes two specialized Final Cut Pro USB keyboards with color-coded, function-marked keys: the \$110 E-Series Final Cut Pro EZ Keyboard (818/840-9100, www.postop.com) and the \$140 P-Series Final Cut Pro EZ Keyboard, which includes multifunction keys at the top and a removable wrist rest (see "Colorful Keys"). Pro-max offers a similarly colorful Final Cut Pro Custom Keyboard (\$149, 800/977-6629, www.promax.com). These will, over time, help you memorize the function-key placement—and they're a more permanent solution than the function-key stickers Apple supplies in the Final Cut Pro box. (Although most laptop users choose portability over ease of use, you can use these USB keyboards with PowerBooks as well—you'll just have to carry one more thing around with you.)

Edit controllers offer programmable buttons that take the place of keyboard shortcuts. These controllers may resemble the tape-to-tape edit mechanisms of the previous millennium (this may comfort some editors), but make no mistake, these new devices belong in the digital age.

Contour Design (800/462-6678, www.contourdesign.com) makes the ShuttlePro multimedia controller (\$99; *Reviews*, elsewhere in this issue). This USB device has drivers for both OS 9 and OS X and works seamlessly with all versions of Final Cut Pro. It offers a traditional jog/shuttle wheel and 13 fully programmable function keys (see "Space Shuttle").

Focus Enhancements (408/866-8300, www.focusinfo.com) sells another USB controller called the CommandPost (\$99; *Reviews*, elsewhere in this issue). The OS 9-only CommandPost has a set of 15 programmable buttons and a jog/shuttle wheel. It also sports a fader—an arm that allows you to make variable adjustments to functions such as sound volume and a pointer device that can substitute for a mouse. And it's internally illuminated, making the button labels readable in dark editing-room situations.

Full Speed Ahead

With these tips, efficient editing in Final Cut Pro 3 is at your fingertips. All it takes is a little practice, and you'll be amazed at how much faster your edit sessions become—even with your old G3. □

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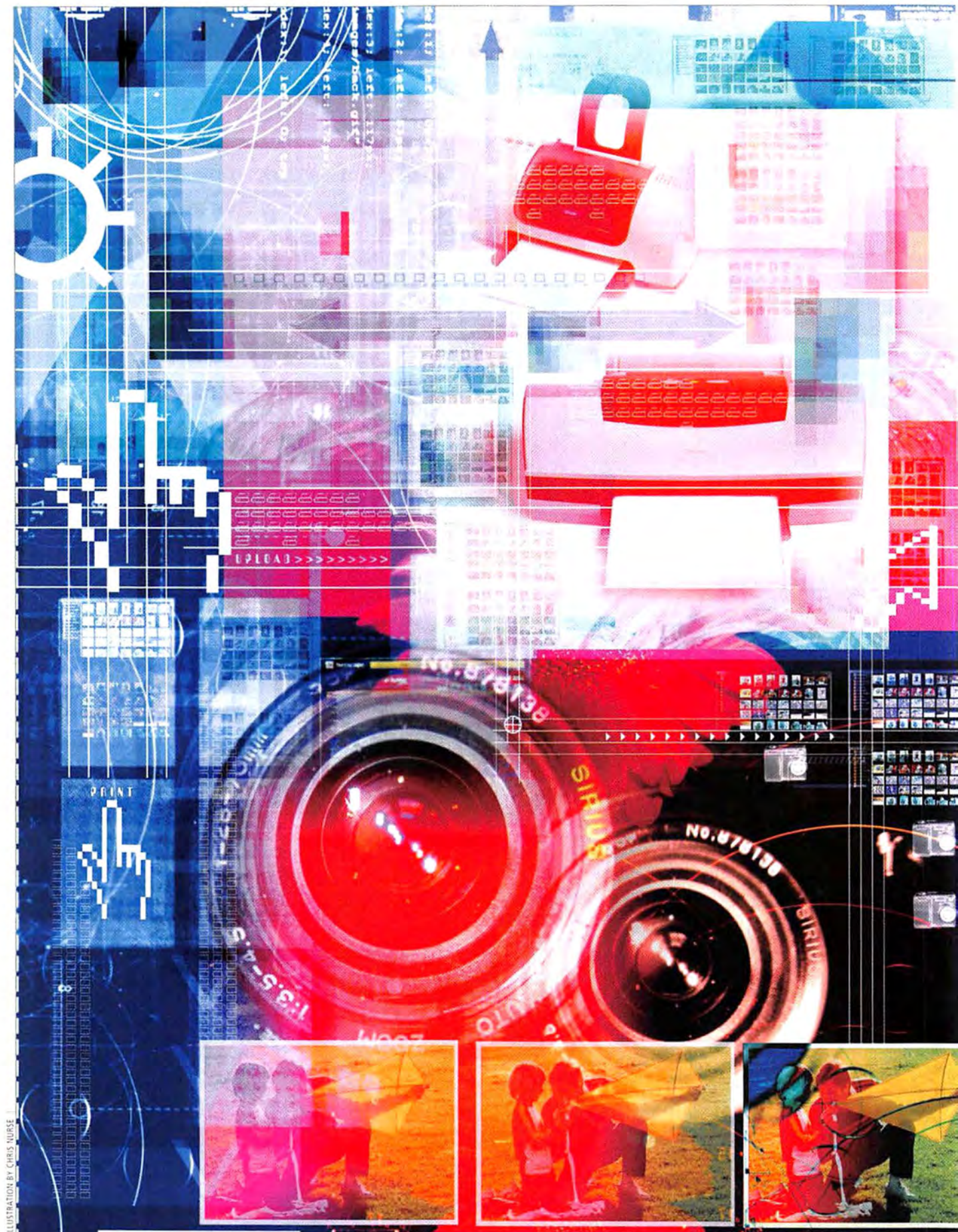


ILLUSTRATION BY CHRIS NURSE

Turn Pixels into Prints



WE PUT 12 ONLINE PHOTO SERVICES AND 5 PHOTO PRINTERS TO THE TEST

Digital cameras offer numerous features that film cameras can't match—including the ability to preview and modify images before you print them. Even though you can drop off a CompactFlash card at a camera store and pick up prints the next day, you give up many of digital photography's benefits if you do. For the best custom prints from your digital camera, you're better off printing them yourself (see "Photo Printers" for a review of ink-jet photo printers) or using an online photo-printing service, a company that prints your uploaded photos and mails them to you.

To find out which sites offer the best features, prices, and—most important—print quality, we ordered eight 4-by-6-inch digital images from a dozen online services (for more on the images we used, see "Behind the Snapshots"). We examined prints from Apple's iPhoto, Club Photo, dotPhoto, eFrames, Kodak Picture Center Online, Ofoto, PhotoAccess, Seattle Filmworks' PhotoWorks, Shutterfly, Snapfish, Sony's ImageStation, and Wal-Mart's PhotoCenter (for detailed information about these services, see "12 Online Photo Services Compared"). The results may surprise you.

Easy Uploading

To get your digital photos printed by an online service, you must first upload them to that service. If

you've got a modem connection, this will be an extremely long process; even Mac users with broadband Internet access will have time to grab a sandwich if they're uploading more than a handful of photos, which can typically be between 400K and 1.5MB each. (And selecting photos to upload can be even more frustrating than the wait.)

Web The most common way to upload photos to a Web site is via your browser. You click on a button, select a single photo file on your hard drive, click on OK—and then repeat the process for every other photo you want to upload. Uploading 30 photos can be a royal pain. Of the dozen services we tried, five wouldn't let Mac users upload images any other way, and we had particularly frustrating problems with the eFrames Web site—our uploads kept timing out.

E-mail Attaching photos to an e-mail message is much less laborious than sending them via your browser, but only ImageStation and dotPhoto offered this option.

Software By far the easiest way to upload photos to an online service is to use custom software. Several of these companies offer applications, browser plug-ins, or both, allowing you to upload a batch of photos by dragging and dropping your images and clicking on a button.

The champion in this category is iPhoto (see "Become an iExpert" [April 2002] for a review of

« iPhoto and tips on getting the most from it), which seamlessly integrates online ordering with an innovative image-cataloging utility (see “Keeping Tabs” for more-advanced media-organizing options). Another impressive utility was PhotoAccess’s PhotoStreamer, which is OS X native (it and iPhoto were the only two in our group that offered OS X compatibility) and a snap to use. We dragged photos out of iPhoto’s browser right into the PhotoStreamer window and then clicked on the Place An Order button to set up our order. And if you don’t want to use iPhoto, you can import photos into PhotoStreamer directly from your digital camera.

Several other services offered OS 9-only software. Shutterfly provides an OS 9 application and plug-in; the company is beta-testing OS X versions of both (neither was available at press time). ImageStation offers both OS 9 and OS X browser plug-ins, but the OS X version refused to install on our test system. Ofoto offers both an OS 9 application, for full-

featured image management, and a plug-in, for quick drag-and-drop uploading. Club Photo also provides an OS 9 application.

Size Restrictions Several Web sites limit the number of photos you can keep online for long-term storage and sharing with others; you should check a company’s policy before deciding on a repository for your images. If you’re using the service just to get prints, those

restrictions are rarely a problem. However, some services limit the file sizes of individual photos—so if you have a fairly high-quality camera (3 or more megapixels), and especially if you edit your images in an application such as Adobe Photoshop before uploading them (an action that can easily double a file’s size), you may run into trouble. PhotoCenter requires that all images be smaller than 2MB; ImageStation and Snapfish limit you to 3MB per photo; and Club Photo balked at a 4.3MB file we tried to upload—there was no indication of whether that was due to a Web-site error or a file-size restriction.

And Kodak Picture Center limits you to 5MB per upload, even if you’re uploading multiple photos. This means you’ll require several upload sessions if you’re sending more than a handful of images.

Prepping Your Photos

Most services let you modify your images once they’re uploaded, so that prints will be more attractive. In almost every case, it’s easier (and more effective) to make changes before uploading, whether you use iPhoto’s rudimentary image-editing tools; a free photo-fixing tool such as Caffeine Software’s PixelNance (408/249-1290, www.caffeinesoft.com); or the big gun, Adobe Photoshop (\$609; 800/833-6687, www.adobe.com). However, if using image-editing software isn’t your bag, some of these sites let you make modifications.

Cropping Is Key Cropping your images is one of the most vital parts of ordering digital photos. Because digital cameras capture images with a 4:3 aspect ratio, there’s more image area than can be displayed on a standard print. The result is that most photo services

ALTHOUGH MANY OF THE SERVICES WE LOOKED AT ALLOW YOU TO CROP YOUR PHOTOS ONLINE ONCE YOU’VE UPLOADED THEM, CROPPING YOUR IMAGES BEFOREHAND IS A BETTER WAY TO GO.

12 Online Photo Services Compared

SERVICE	URL	UPLOAD OPTIONS	GLOSSY/ MATTE	STANDARD SHIPPING	EDITING TOOLS
Club Photo	www.clubphoto.com	OS 9 app, Web form	yes/no	\$1.99	brighten/darken, rotate
dotPhoto	www.dotphoto.com	Web form, e-mail	yes/yes	\$1.39	crop preview, rotate, calibration
eFrames	www.eframes.com	Web form	yes/no	\$1.99	rotate
ImageStation	www.imagestation.com	OS 9 plug-in (OS X plug-in wouldn’t install), Web form, e-mail	yes/no	\$2.49	autocorrection, brightness/contrast, templates, borders, sharpen, crop, red-eye, rotate
iPhoto	www.apple.com/iphoto	OS X app	yes/no	\$2.99	crop, red-eye, rotate, black-and-white
Kodak Picture Center Online	http://picturecenter.kodak.com	Web form	yes/no	\$1.95	crop, red-eye, rotate, instant fix, lighten/darken
Ofoto	www.ofoto.com	OS 9 app and plug-in, Web form	yes/no	\$1.49	autocorrection, crop, flip/rotate, red-eye, black-and-white, color casts, effects, borders
PhotoAccess *	www.photoaccess.com	OS 9 and OS X apps, Web form	yes/yes	\$1.95	rotate, crop
PhotoCenter	www.walmart.com/photo/	Web form	yes/no	\$1.38	rotate
PhotoWorks	http://photoworks.com	Web form	yes/no	\$1.75	sepia, black-and-white
Shutterfly *	www.shutterfly.com	OS 9 plug-in and app; OS X in beta	yes/no	\$1.49	autocorrection, red-eye, crop, rotate, black-and-white, color casts, effects, borders
Snapfish	www.snapfish.com	Web form	yes/no	\$1.49	rotate

* = Editors’ Choice.

must crop standard-dimension digital images when they print them; the notable exception in our tests was PhotoWorks, which printed our images in full—though prints had highly conspicuous white strips down their right side.

It's better to crop your images before ordering prints, especially if you've carefully framed a shot. And services leave the middle of your image intact by default, so if the key part of your image is in the bottom or top half of the frame, you should definitely crop first.

The iPhoto application has great cropping tools and provides preset ratios for common print sizes such as 4 by 6 inches and 5 by 7 inches. Although many of the services we looked at allow you to crop your photos online once you've uploaded them, cropping your images beforehand is a better way to go. If you don't want to bother, however, eFrames is a good choice: it offers the best cropping features, announcing that images will be cropped and letting you choose the crop area for each image during the checkout process.

Perhaps our favorite option was offered by PhotoAccess, which lets you order "digital-size" prints that conform to the 4:3 aspect ratio. These differently shaped prints won't fit in albums or frames designed for traditional photos, but they preserve your entire digital image and require no cropping. And companies such as AlbumSource.com (866/772-7200, www.albumsource.com) now sell photo albums that hold 4.5-by-6-inch digital prints.

Other Edits Many of the services we tried offer some editing features; of course, Web browsers weren't really designed to edit photos, so these features' interfaces tend to be a bit weird. Still, most services let you

Weighing Your Options

Both online photo services and photo printers let you fix up your digital pictures before printing, but depending on your budget and specific printing needs, one way might be better for you. Here are some of the pros and cons associated with each.

Online Photo Services

Pros: Easier than printing your own photos; prints are relatively inexpensive; no costly equipment needed; you can share prints online and have prints mailed directly to friends and family; many services offer free prints, so you can shop around.

Cons: You must wait for photos to be mailed; less flexibility overall; larger-size prints are significantly more expensive; you can't know what pictures will look like until they are received; requires cropping photos for standard-size prints.

Photo Printers

Pros: Immediate printing; print size limited only by the printer; full control over color, sharpening, and other options; you can easily adjust and reprint photos if they don't match your desired results.

Cons: Large initial expense; costly special paper and inks; good for photos but not for text; getting good prints requires some expertise and baby-sitting of your printer.

take a stab at reducing red-eye, converting color photos to black-and-white, and rotating images. Shutterfly, Ofoto, and ImageStation also give you instant-fix options—automated adjustments to color and brightness levels. (Most services also seemed to make their own adjustments to our images before printing them, even though we had made no changes to brightness or contrast ourselves.)

By default, Shutterfly will automatically adjust your image's exposure and colors before printing, a service it calls VividPics. But you can also select a "Do not apply any automatic corrections to my picture" option, and if you've used color-management software to edit your image in an sRGB workspace, the colors you see on your calibrated monitor will be very close to those in the output from Shutterfly. In fact, of the services we tested, Shutterfly offered the prints that were most faithful to our original images.

continues on page 76 >

OUTPUT OPTIONS (INCHES)

3×5	4×6	5×7	8×10	12×18	16×20	20×30	WALLET SIZE (NUMBER)	OTHER OUTPUT OPTIONS
\$0.25	\$0.45	\$0.99	\$3.99	no	no	no	\$1.79 (4)	books, frames, food, stuffed animals, cards, checks, stamps, T-shirts, mugs, magnets, earrings, more
\$0.29	\$0.29	\$0.95	\$2.95	\$9.99	no	no	\$0.95 (4)	cards
no	\$0.49	\$0.99	\$3.99	\$4.99 (11×14)	no	no	\$5.00 (8)	shirts, puzzles, mouse pads, mugs, puzzles, key chains
no	\$0.49	\$0.99	\$3.49	no	\$14.99	\$19.99	\$1.79 (4)	mugs, cookies, mouse pads
no	\$0.49	\$0.99	\$3.99	no	\$14.99	\$19.99	\$1.79 (4)	books
no	\$0.49	\$1.49	\$4.49	no	no	no	no	mugs, mouse pads, sweatshirts, T-shirts, puzzles
no	\$0.49	\$0.99	\$3.99	no	\$14.99	\$19.99	\$1.79 (4)	cards, photo albums, archive CDs
\$0.35	\$0.45	\$1.09	\$2.95	\$11.95	no	no	\$1.49 (4)	slides, multiple digital sizes, 11×14 prints, album pages, gift wrap, mugs, more
no	\$0.26	\$0.96	\$2.86	no	no	no	\$2.86 (8)	mouse pads, cards, mugs, T-shirts, plates
\$0.35	\$0.45	\$0.99	\$2.99 (8×12)	no	no	no	no	brag books, photo CDs, photo DVDs, calendars, mugs, mouse pads, more
no	\$0.49	\$0.99	\$3.99	no	no	no	\$1.79 (4)	snapbooks, cards, archive CDs
no	\$0.59	\$0.99	\$3.99	no	no	no	\$1.99 (4)	cards, photo CDs

PHOTO PRINTERS ▶

PRINTING AT HOME HAS NEVER BEEN BETTER

In the past two years, ink-jet photo printers have improved so much that their output can easily be mistaken for traditional photographs (for more on the pros and cons of printers and online photo services, see "Weighing Your Options"). Epson was the first company to reach this level of quality, but recent developments from Canon and Hewlett-Packard mean that there are plenty of good printer options. If you want to print your own images, you'll find that an ink-jet photo printer can provide you with more control and flexibility than an online service can.

We tested a wide-ranging group of photo printers from Canon, Epson, and HP. For straight-ahead, no-frills printing, we looked at Epson's entry-level Stylus Photo 820 (\$149) and Canon's speedy S900 (\$399). We also evaluated three photo printers that can read digital-camera media cards and print without computer intervention: Canon's S820D (\$399), Epson's Stylus Photo 785EPX (\$199), and HP's Photosmart 1315 (\$399). (For reviews of the Canon S800, Epson Stylus Photo 780, Epson Stylus Photo 1280, and HP Photosmart 1218, see

"Macworld's Ultimate Buyers' Guide: Printers," August 2001; for a review of the Epson Stylus Pro 5500, see *Reviews*, December 2001; and for a review of the Olympus P-400 dye-sub photo printer, read our online-only review at www.macworld.com/2001/06/11/reviews/p-400.html.)

Epson Stylus Photo 820 and 785EPX

The Stylus Photo 820 and 785EPX represent minor evolutions in Epson's printer line—beyond slightly improved print speeds, lower prices, new case designs, and media-card support, they have few major changes. Like Epson's other current ink-jet printers, these models have a maximum print resolution of 2,880 by 720 dpi. It's rarely necessary to print at that resolution, however—it's slow and uses up more ink than the similar-quality 1,440-dpi print mode.

Both printers support borderless printing on five popular paper sizes, ranging from 3.5 by 5 inches to letter size (you'll still need to crop your image to the correct aspect ratio). This feature mimics the edge-to-edge printing of traditional (and online) photo-

processing services and eliminates the need for oversized, perforated paper that leaves rough edges. (This feature, however, is not currently supported in OS X—but Epson does have the widest array of available paper sizes in OS X.)

The Epson printers also offer fade-resistant inks, which the company claims will last 25 years (on specific paper types and under ideal storage and lighting conditions).

While both Epsoms did well in the image-quality department, they weren't the fastest photo printers we looked at—the Stylus Photo 820 and 785EPX came in last in our speed tests (see "Photo Finish" for details).

Canon S820D and S900

Canon has lagged behind its photo-printer competitors, but the company's latest printers shrink the quality gap, and they're the fastest printers in their class.

The S820D and S900 have a maximum resolution of 2,400 by 1,200 dpi, and they have an important feature not found in any other photo printer priced under \$1,000—individual ink cartridges for each color.

Following Epson's lead, Canon is using light-fast inks with these models and making

the same claims of 25-year print life. Canon has also adopted 4-by-6-inch and letter-size borderless prints—which are not, however, currently available in OS X—with these printers. In fact, Canon's paper-size selection in OS X is woefully slim, limited to letter size, 4 by 6 inches, and various European and envelope sizes.

The S900 is the fastest photo printer we have yet tested, tossing out a 4.5-by-6-inch photo in best-quality mode in 1 minute and 5 seconds—nearly twice as fast as the S820D, and about four times as fast as the HP and Epson printers. The only speed test the S900 didn't win was with the 10-page Microsoft Word document—a race the S820D won handily.

HP Photosmart 1315

Like the Epson printers, HP's Photosmart 1315 represents merely an evolution—most of the printer's enhancements are related to media-card support.

The Photosmart has a maximum resolution of 2,400 by 1,200 dpi and two paper-input trays, including a tray for printing 4-by-6-inch photos. (It doesn't support borderless printing, relying instead on perforated paper.)

The Photosmart was slightly faster than the Epson printers

Five Ink-Jet Photo Printers Compared

COMPANY	PRODUCT	MOUSE RATING	PRICE	OS COMPATIBILITY	CONTACT	MEDIA-CARD SUPPORT	PROS	CONS
Canon	S820D	★★★★	\$399	Mac OS 9, Mac OS X	800/652-2666, www.usa.canon.com	CompactFlash (Memory Stick and SmartMedia with third-party PCMCIA adapter)	Very good print quality; speedy; individual ink cartridges; borderless printing.	Color fidelity not as good as Epson printers; media-reader LCD costs extra; OS X driver issues.
	S900	★★★★	\$399	Mac OS 9, Mac OS X		None	Very good print quality; fastest print times; individual ink cartridges; borderless printing.	Color fidelity not as good as Epson printers; OS X driver issues; expensive.
Epson	Stylus Photo 785EPX	★★★★	\$199	Mac OS 9, Mac OS X	800/873-7766, www.epson.com	CompactFlash (Memory Stick and SmartMedia with third-party PCMCIA adapter)	Excellent print quality and color fidelity; extensive borderless-printing support; CompactFlash slot.	Slow performance; LCD costs extra; OS X driver issues.
	Stylus Photo 820	★★★★	\$149	Mac OS 9, Mac OS X		None	Excellent print quality and color fidelity; low price; extensive borderless-printing support.	Slow print performance; small ink tanks; OS X driver issues.
Hewlett-Packard	Photosmart 1315	★★★	\$399	Mac OS 9, Mac OS X	800/752-0900, www.hp.com	CompactFlash, Memory Stick, SmartMedia	Adequate print quality; excellent card-reader features; built-in LCD screen.	Poor tonal gradation and color fidelity due to four-color ink system; oversaturated; requires perforated paper for borderless effect.

Photo Finish

Canon wins this printer race. The S900 was as much as four times faster than its competition in some of our photo-printing speed tests, and the S820D handily beat the other printers in our Word-document speed test. If you want speed, your choice is clear.

Macworld LAB TEST	4.5-by-6-Inch Photo		8-by-10-Inch Photo		10-Page Word Document	
	BEST QUALITY	GOOD QUALITY	BEST QUALITY	NORMAL QUALITY		
Canon S820D		2:08		1:08		4:48
Canon S900		1:05		0:43		8:22
Epson Stylus Photo 785EPX		4:44		3:00		5:32
Epson Stylus Photo 820		4:33		2:54		5:27
HP Photosmart 1315		4:14		2:16		6:14
BEST RESULTS IN BOLD. < BETTER						

All scores are in minutes:seconds. Our test system was a Power Mac G4/500 with Mac OS X 10.1.3 and 256MB of RAM installed. We set displays to 1,024-by-768-pixel resolution and 24-bit color. We used Photoshop 6.0.1 in OS X's Classic mode to print the photographic images. We recorded the time each printer took to print a 4.5-by-6-inch photo at its good-quality and best-quality settings. We recorded the time each printer took to print an 8-by-10-inch photo at its best-quality setting. We also recorded the time each printer took to print a 10-page Microsoft Word X document at its normal-quality setting.—MACWORLD LAB TESTING BY JAMES GALBRAITH

in our speed tests, but it was no speed demon.

Compatibility

Each printer connects via USB (even though none comes with a USB cable) and includes very basic programs for image editing and printing. Each works in both OS 9 and OS X, though the OS X support is not as full-featured (see "Photo Printing and OS X" for more details).

Print Quality

The models from Epson and Canon add light cyan and light magenta inks to the traditional cyan, magenta, yellow, and black inks found in most mainstream ink-jet printers. The light inks help provide a wider tonal range, especially with flesh tones. Prints from the Photosmart, which uses the four-color system, were very good but not up to the level of its six-color competitors.

Prints from the Canon S900 and S820D exhibited excellent detail and very good tonal gradation. Although they were very close to the Epson prints in overall quality, they still came up short, according to our jury of experts, especially in terms of color accuracy—when compared with the calibrated screen display—and

tonal range. For example, skin tones looked more realistic in the Epson output than they did in the Canon or HP prints. Slight color shifting was more noticeable with the Canons, while the HP generally produced more-extreme color shifts and much more saturated prints—by using more ink, but this results in a look many people find appealing.

The Epson printers' magnificent tonal range is evident in images that include skin tones or patches of graduated color (as in an image of the sky, for example). Prints from the Canon and HP printers exhibited problems, such as artifacts, with these types of images. Also, when looking at glossy prints from the S900 and S820D with a magnifying loupe, we saw light banding in parts of some images, as opposed to the finely diffused dot pattern that the Epson printers achieve.

While the Canon printers come close to the Epsoms in terms of quality, the HP Photosmart is hampered by its continued reliance on a four-color ink system. Although banding wasn't much of a problem, photos from the Photosmart were not as crisp as those from the Canon and

Epson printers; the Photosmart's prints had bigger dots, blown highlights, and the extreme color shifts discussed previously. It is possible to get satisfactory prints from the Photosmart, but you'll have to prepare your images a bit to get them, and you won't have the wider tones to work with.

Media-Card Readers

Of the three printers that include media readers, the Photosmart has the best set of built-in features: slots for SmartMedia, CompactFlash, and Sony's Memory Stick cards. The reader-equipped Canon and Epson models ship with a PC Card slot and a CompactFlash adapter, but both companies will exchange the adapter for one that works with your camera. (The S820D also has a port for connecting a Canon PowerShot S30 or S40 digital camera for direct printing.)

HP is also the only manufacturer to include a built-in LCD screen for displaying images from the media cards (Canon and Epson each offer a smaller LCD attachment for an additional \$99). The HP LCD is especially helpful if you want to crop images or manipulate color or saturation without having to waste paper. The smaller



Canon S820D



Canon S900



Epson Stylus Photo 785EPX



Epson Stylus Photo 820



HP Photosmart 1315

PHOTO PRINTERS

LCDs were too tiny to be of much use for anything other than viewing thumbnails.

All the printers with built-in readers have good options for printing images, including different paper types and sizes, multiple copies, and more. Inserted media cards will automatically mount on the Mac desktop, although we couldn't get this feature to work with the Stylus Photo 785EPX or the Photosmart 1315 while running OS X (it worked fine with OS 9). However, the Photosmart has an excellent Send To Computer button that automatically uploads all of the images on a card to your Mac, and it was possible to upload images automatically via one of HP's software utilities.

If you want the convenience of printing directly from a card, HP offers the best overall interface, with Canon and Epson lagging slightly behind (largely due to the omission of an LCD).

Photo Printing and OS X

Canon, Epson, and HP have invested years of work in their print drivers for OS 9, and as a result they have an excellent array of features for many printing tasks (for example, custom layouts and paper sizes, and flexible color-printing options).

OS X support is a different story. Each company supports printing in OS X, but none offers an OS X driver as functional as its OS 9 driver.

The biggest OS X omission, and one all three companies share, is the ability to create custom paper sizes. It's also not possible to print banners in OS X, a feature available in OS 9 from each company.

Each vendor said that the issue is with OS X's print architecture, not its own development teams. Each company also said that it was committed to providing complete parity

between its OS 9 and OS X drivers, although doing so will probably require another Apple update to OS X.

Macworld's Buying Advice

Epson remains at the top of the heap in print quality and color fidelity. If you want the best-possible color but don't want to do a lot of work, either of the Epson printers would be right for you. The Stylus Photo 785EPX's low cost and media support make it especially convenient, though the lack of OS X support on the media reader is something to keep in mind.

With its lower price, the Stylus Photo 820 is hard to pass up. Its big downside is that it has the smallest ink tanks of any printer we tested, which means more-frequent cartridge changes than the other printers required. If you have a voracious printing appetite, we recommend the Stylus Photo 785EPX, which has bigger ink tanks, or one of Epson's other photo models, such as the Stylus Photo 890 or 1280.

We were impressed by Canon's leap in quality—both the S820D and S900 offer a great mix of very good image quality and top print speeds. Given the competition's pricing, \$399 is a lot for one of these printers, but if you want the extra speed and are willing to spend some time playing with your images, you won't be disappointed. If you're looking to save a little cash and don't need the S820D's media-card reader, look at the \$299 S820.

HP's Photosmart 1315 is not a bad printer, but it pales in comparison to the others we reviewed here. If you like the oversaturated look that HP specializes in, or if you're looking for a general-purpose photo ink-jet printer with excellent media-reader support, the 1315 is a solid choice.—RICK LEPAGE

< continued from page 73

Labeling Shutterfly's ability to add extensive labels to prints impressed us; from your Web browser, you can enter as many as 80 characters of descriptive text, which appears on the print's back. By default, Shutterfly uses the image's embedded information to add the date and time your photo was taken to the label. Most other services print on the back of each photo the date it was printed and its number in its group.

Placing an Order

Once your photos are ready to go, it's time to order prints. Most services offer a standard array of sizes for glossy photos: 4 by 6 inches, 5 by 7 inches, 8 by 10 inches, and wallet size (in sets of four) are offered almost universally. Several services also offer 3-by-5-inch prints, large prints (as big as 36-by-48-inch posters), and a panoply of custom items: cards, mugs, T-shirts, mouse pads, baseballs, magnets, and even cookies. Many services also let you order matted and framed pictures—useful if you're sending photos as gifts. And in case glossy isn't your style, PhotoAccess and dotPhoto offer matte prints.

Print Costs Most of the photo services we looked at were roughly comparable in terms of print prices. Standard 4-by-6-inch prints usually cost 49 cents each, although PhotoWorks and PhotoAccess charge 45 cents, and dotPhoto and PhotoCenter charge a bargain-basement 29 cents and 26 cents, respectively. Snapfish is the costliest, at 59 cents. A 5-by-7-inch print will generally cost you 99 cents; 8-by-10-inch prints, around \$3.99. And several services offer bulk or subscription rates for those who print a lot of photos.

Shipping Costs Every service adds shipping and handling charges for delivery by the U.S. Postal Service. The most common shipping charge is \$1.49 per order, and most shipments are between \$1.38 and \$2.00. Apple has apparently chosen to recoup in shipping charges the money it spent developing iPhoto—it has the most expensive shipping option, at \$2.99, despite the fact that it uses the same photo-printing service as ImageStation (\$2.49) and Ofoto (\$1.49). Many services also offer express shipping for faster (and more expensive) delivery.

Given our location in San Francisco—close to several of the services we tested—the amount of time it took for us to receive photos may not be comparable to how long it takes for people living in other regions. However, we received all of our orders in a matter of a few days, even from services across the country. (The one exception was Vancouver-based PhotoChannel, whose prints took more than a month to arrive—too late to be included in our testing.) As a

More Info:

www.macworld.com/2001/04/howto/color.html

Check out Bruce Fraser's "Get Consistent Color Every Time with Photoshop 6 and Your Ink-Jet Printer" (*How-to*, April 2001). Although Adobe has since introduced Photoshop 7, Bruce's tips still apply.

result, we heartily endorse using the U.S. Postal Service for orders whenever possible—it was by far the cheapest option, and it served us well.

The Print's the Thing

The experience of using a Web site—the features it offers, the ease of using the interface, the utilities that simplify uploading—is a key part of the photo service. But fundamentally, the quality of the prints is the most important aspect of any photo-printing transaction. That's why we ordered the same eight photos from each service (fewer for those services with strict file-size limits) and compared their image quality with that of the color-managed source files.

The world's greatest Web site shouldn't earn your business if the company behind it produces muddy, faded, or overprocessed prints. Fortunately, the photo services that produced the best-looking prints also had some of the best Web sites.

The Head of the Class Shutterfly produced our favorite prints, most accurately representing the colors in our originals. The ability to turn Shutterfly's VividPics color-adjustment technology on and off probably helped this service match our prints. An intentionally overexposed print corrected by VividPics ended up looking great, too.

Three Great Options In terms of print quality, three other services came in just behind Shutterfly: PhotoAccess, Snapfish, and Kodak Picture Center. All three provided great-looking prints that would satisfy all but the most demanding eye, though their prints weren't quite as accurate as Shutterfly's.

PhotoAccess's prints offered good color and saturation—even in its digital-size prints—though they were slightly bright.

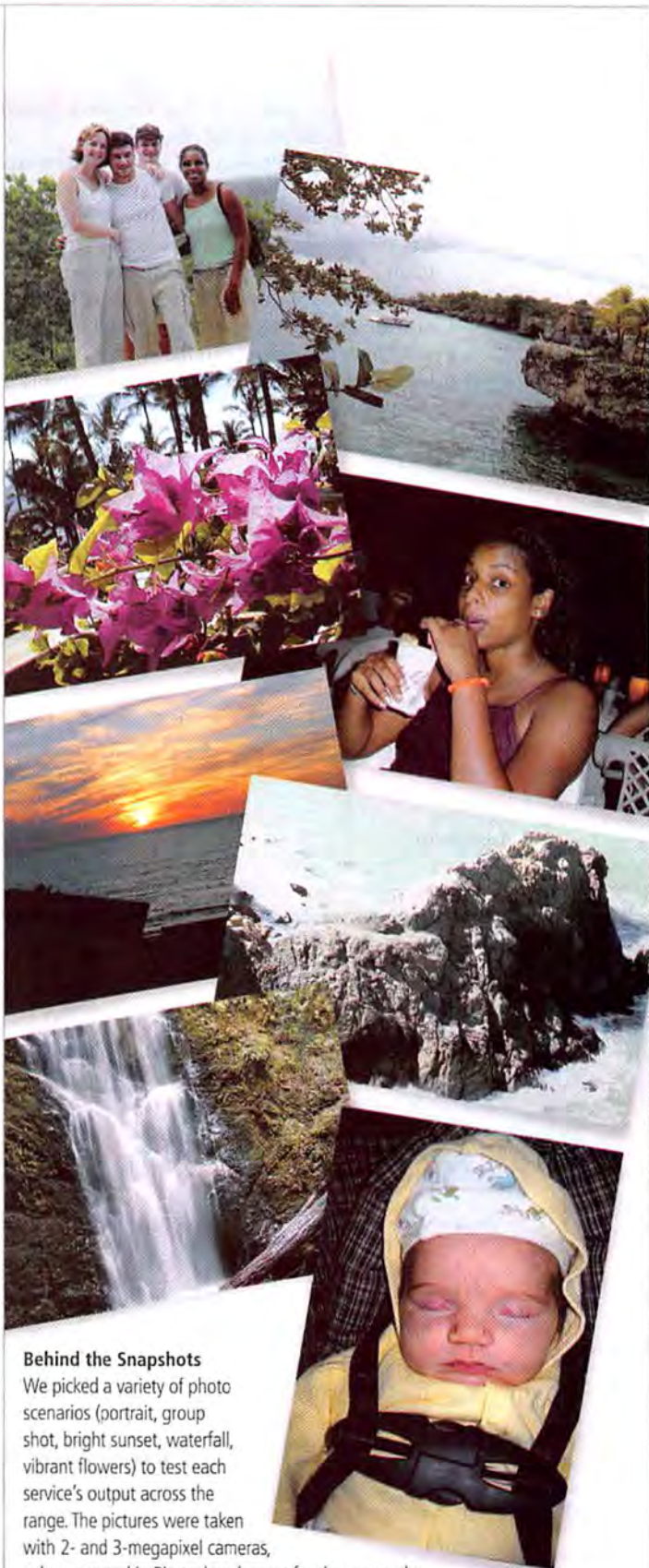
Although Kodak owns Ofoto—the company that provides prints ordered through iPhoto, ImageStation, and Ofoto—Kodak Picture Center uses a completely different service that delivers remarkably good image quality. Our prints from Kodak Picture Center had good color and saturation, but they were slightly dark.

The prints we got from Snapfish also had very good color and saturation levels.

Close Call The prints we got from eFrames were good—albeit a bit oversaturated—and overall just slightly below the quality of our top four services.

Lagging Behind The next group of sites provided us with problematic prints. At 26 cents per 4-by-6-inch print, Wal-Mart's PhotoCenter was our low-price >>

THE EXPERIENCE OF
USING A WEB SITE—
THE FEATURES IT
OFFERS, THE EASE OF
USING THE INTERFACE,
THE UTILITIES THAT
MAKE UPLOADING
EASY—IS A KEY PART
OF ANY ONLINE
PHOTO SERVICE.



Behind the Snapshots

We picked a variety of photo scenarios (portrait, group shot, bright sunset, waterfall, vibrant flowers) to test each service's output across the range. The pictures were taken with 2- and 3-megapixel cameras, color corrected in Photoshop (except for the purposely overexposed rock-and-ocean scene), and embedded with sRGB color profiles. We then compared the prints we received with our test images, displayed on a calibrated monitor for accurate representation. Our jury considered many factors, such as skin tone, color accuracy, shadow detail, highlights, cloud nuances, and proper saturation.

leader, but the prints themselves were unsaturated (washed out) and had a red cast.

Prints from dotPhoto were slightly more expensive than prints from PhotoCenter (at 29 cents), but they were roughly equivalent in quality, with blown highlights, unsaturated color, and poor flesh tones.

Club Photo offers a staggering number of nonprint options, including food, stuffed animals, and checks. Unfortunately, the prints we ordered from Club Photo had the same problems that the dotPhoto prints did—the baby in one of our sample photos looked pale and wan.

Keeping Tabs

Apple's free iPhoto is a great tool for capturing and organizing your digital photos. But maybe you want one application that keeps track of photos, sound and video clips, presentations, text, and more. Or perhaps you need OS 9 and OS X compatibility. If you need more than iPhoto can offer, another product may do the trick.

COMPANY	PRODUCT	PRICE	OS COMPATIBILITY	CONTACT
Canto	Cumulus 5.5 Single User Edition	\$99	Mac OS 9	415/703-9800, www.canto.com
Extensis	Portfolio 6	\$200	Mac OS 9	800/796-9798, www.extensis.com
FWB Software	Catalog Toolkit	\$90	Mac OS 9, Mac OS X	408/969-8620, www.fwb.com
iView Multimedia	iView Media Pro	\$50	Mac OS 9, Mac OS X	800/903-4152, www.iview-multimedia.com
Rune Lindman	Qpict Media Organizer 5.0	\$35	Mac OS 9, Mac OS X	support@qpict.net, www.qpict.net

The Ofoto Services Kodak-owned Ofoto operates its own Web site, and it does the printing for both iPhoto and ImageStation. Prints from these three services were identical. The bad news, especially for iPhoto users, is that the Ofoto-printed photos were among the worst we received. They were remarkably unsaturated and had noticeably red shadows. Tonal ranges in other parts of the photos lacked red, resulting in a cyan cast that produced unappealing, ghoulish flesh tones.

Unfit to Print Our worst experience was with PhotoWorks. The photos we ordered were savagely auto-corrected, with blown-out highlights and shifting colors. PhotoWorks also heavily oversharpened our images, turning pleasant depths of field into razor-sharp nightmares of edges and jags.

To make matters worse, PhotoWorks scaled our photos to the size of the prints, leaving a white band on the right side of each. Unlike the other services, which either crop photos automatically to fit prints or let you choose how your image will be placed on paper, PhotoWorks offers no cropping options and hides (behind a FAQ link on its ordering page) the fact that it's going to leave a white strip on each of your prints.

The Last Word

Shutterfly and PhotoAccess are both excellent online imaging services that provide high-quality prints at reasonable prices. Shutterfly's prints were the best from any of the 12 services we looked at, and the ability to turn off its automatic color processing makes this service a great choice for anyone who wants color fidelity based on appearances in color-managed programs such as Photoshop. Shutterfly's ability to customize information on the back of your prints (with the good sense to use the date the picture was taken as the default text) was also one of our favorite features of any photo-printing service. PhotoAccess's prints were almost as good as Shutterfly's, and the former's options for digital-size prints and its OS X-native client software make it another great choice.

If you're an iPhoto user, you may not be able to resist the simplicity of clicking on the program's Order Prints button. But we suggest giving these other services a try. With PhotoAccess's OS X-native image uploader (and Shutterfly's equivalent, once it's available), transferring iPhoto images to these services is as simple as dragging, dropping, and clicking. These additional steps will result in better-looking photographs—and when it comes to digital images, the proof is in the print. □

Editor JASON SNELL has taken hundreds of digital photos, many of his new daughter, Jamie. Contributing Editor and color expert BRUCE FRASER helped evaluate the prints.

Design Tip: Save time with pre-masked images



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Photo-Objects™

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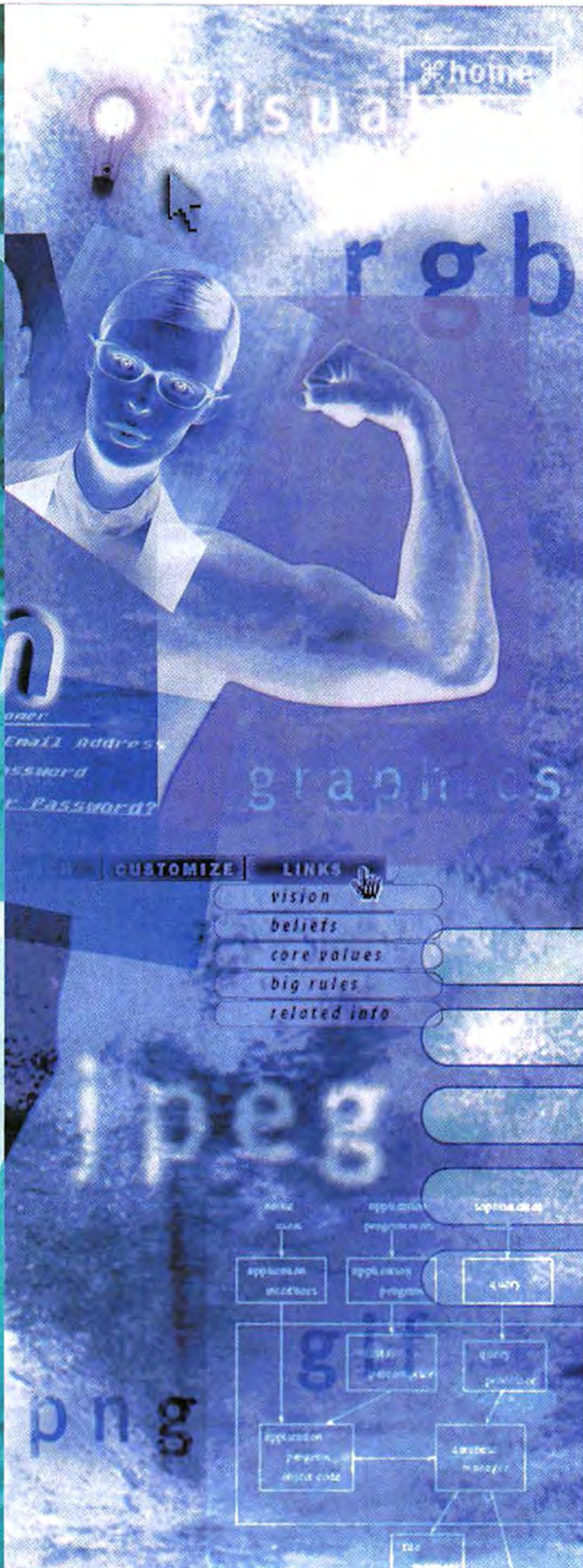
anchises_HMColParam = "Los Angeles"
request.Form("txtCity") <= ">" then
anchises_HMColParam = Request.Form("txtCity")

```

```

rsFranchises = Server.CreateObject("ADODB.Recordset")
anchises.ActiveConnection = rsFranchises
anchises.Source = "SELECT tid, address, city,
FROM Franchises WHERE City = " & Request.Form("txtCity")
anchises.CursorType = adOpenStatic
anchises.CursorLocation = adLocStatic

```



Macromedia's Dynamic Duo

Dreamweaver MX and Fireworks MX Give You Web-Site Superpowers

A simple ten-page Web site may have been a sufficient Web presence six years ago. Now you can find sophisticated JavaScript programs, advanced Cascading Style Sheets (CSS), and database integration on even the humblest sites. As Web developers' needs have grown, so too has their desire for more-powerful Web-site-building software. This is *Macworld's* first look at Dreamweaver MX, a program that Macromedia designed to meet those and many other needs.

Macromedia introduced Dreamweaver in 1997 as a professional WYSIWYG Web-site-building program. When dynamic, database-driven sites became common, Macromedia introduced Dreamweaver UltraDev, a separate application. Continuing this evolution, Dreamweaver MX is an improvement on Dreamweaver's design and site-management tools, and it offers the powerful programming tools of UltraDev. It supports new standards such as XHTML, advanced technologies such as ASP.NET and PHP, and industry practices that make sites more accessible and produce better HTML. Macromedia envisions Dreamweaver MX as a one-size-fits-all program, and it's courting Web developers of all levels—from absolute beginners, who may not know a root folder from a root cellar, to advanced programmers who drool at the mention of "Web service introspection."

Regardless of your experience level, Dreamweaver MX packs a lot of punch; it has many new features, as

well as enhancements to some of Dreamweaver's familiar tools. And it runs natively in OS X.

We extensively tested beta versions of Dreamweaver MX and Fireworks MX (see "Macromedia Fireworks Gets the MX Treatment"). As this article went to press, Dreamweaver MX's feature set was final, but the engineers were still improving stability and performance. Because of that, we won't discuss the speed and stability of Dreamweaver MX here.

Ease of Entry

Although the Web-design field is relatively easy to enter, there are so many facts to keep straight—where to store files and how to use HTML in building a professional layout, for example—that novices are often at a loss as to where to start. Dreamweaver MX offers several new features that can help beginners begin exploring the world of Web design.

Simplified Site Setup The new Site Setup wizard makes it easy to start building a Web site. Its straightforward language and step-by-step series of windows make the setup process a point-and-click operation. If you just want to build a simple Web site, the wizard leads you through several windows that ask for basic information such as what you want to name the site and where you want to store the site's files. If your needs are more ambitious—for example, if you want to set up a connection to a live Web server or build a database-

driven site—useful Test buttons appear during the setup, letting you check connections to Web and application servers. In this way, you can make sure your setup is working before you begin any serious work.

Predesigned Components Neophytes can also take advantage of a variety of already created content to jump-start the design process. E-commerce, slideshow, search-page, and other common user interfaces are just a few of the designs that ship with MX. The redesigned New Document window lets you open completed CSS files, Frameset pages, and Web-page

designs that you can save to your site. Clicking on the Get More Content button takes you to the Macromedia Exchange Web site, where you can download even more templates.

Going Dynamic

Macromedia designed Dreamweaver UltraDev for building dynamic Web sites. Its extra-strength tools once cost \$300 more than the basic Dreamweaver. Now UltraDev's dynamic Web application features are included with Dreamweaver MX.

Refine Dreamweaver MX's Templates to Gain Power

Since version 3, Dreamweaver's Template feature has simplified the process of enforcing design consistency and making sitewide design changes to layouts (see "Easy Updates with Dreamweaver," July 2000, and *Web Publishing Secrets*, March 2002). However, it's always suffered from one important limitation: a template is great if every page on your site looks *exactly* the same, but it's not so good if you want even subtle changes on some pages. For example, say you want pages in a certain section of your site to display a slightly different navigation bar—one with a highlighted "You are here"-like button. Even though each page looks *nearly* the same as your original template, you'll need to create a new template or resort to time-consuming workarounds that aren't as easy to update. In a complex site with many pages and multiple sections, you could end up with a dozen very similar templates that have only slight variations. Updating the look-and-feel of this kind of site requires adjusting many templates instead of just one.

With Dreamweaver MX's revamped templating system, you can not only overcome this limitation but also add controls for repeating elements on a page—think product or staff listings—and use a simple expression language to control the display of content in a page created from a template.

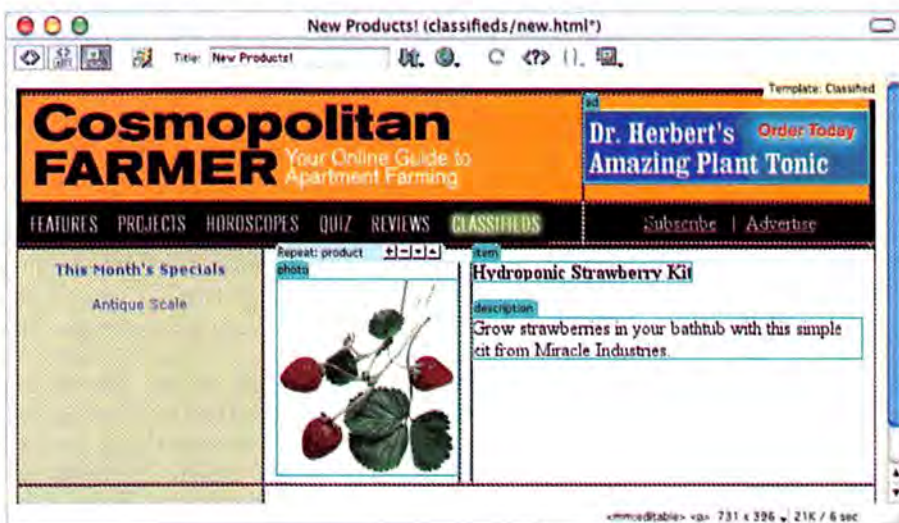
The nested-template feature is one of the most useful additions in Dreamweaver. You can create a master template with the basic features you want on all or most of your site's pages—such as background color, style sheets, basic layout, and copyright information—and then create nested templates that use the basic features of the master template and let you refine page elements. Say your Web site is divided into several sections, and all the pages in one section share a subnavigation system unique to that section. You can build one template for the entire site layout and separate nested templates for each section of the site.

To make updating easy, nested templates remain linked to their master template file. If you want to change the background color of all your site's pages, edit the master template and let Dreamweaver MX update your entire site. But if the only change you need is to the subnavigation of one section of the site, open the nested template for that section and make the necessary changes—Dreamweaver MX updates only those pages.

The new repeating-region and repeating-table tools are useful when you're working with templated pages that contain repeated elements. For example,

part of your company Web site may display product listings, with products divided into categories, and you may want to create for each category a page that lists the names, pictures, prices, and descriptions of all the products in that category. In Dreamweaver MX, you can make a template for the product category and create a repeating region for the product listing. Then, when you create a category page based on this template, you can add additional product listings—using a template design—by clicking on the + (plus sign) button that appears at the top of the repeating region.

The program's other enhancements include *optional regions*, which you can hide or display by changing the template's properties, and an expression language that lets you create user-defined variables so you can control the display of elements in a page. The improvements in Dreamweaver MX's Templating feature are significant; they offer the professional Web developer a powerful way to quickly build, edit, and update high-quality customized pages.



Repeat After Me Dreamweaver MX's Repeating Content feature lets you define a repeatable area on a template. In this example—a page created from a template called Classified—you can edit page areas called Photo, Item, and Description. In addition, you can use the + (plus sign) button to add another row of editable areas, and the – (minus sign) button to remove a repeatable region. The up- and down-arrow buttons let you rearrange the order of repeating regions.

Dynamic is a term used to describe anything from a particularly exciting graphic design to a highly animated, Flash-based Web site. In the context of Dreamweaver MX, however, *dynamic* refers to a Web site that relies on some kind of server-based technology. In other words, instead of a Web page simply being sent from a Web server to a Web browser, the page is first processed in some way by the server—often by connecting to a database and adding, updating, or retrieving information—before being transmitted to the Web browser.

Those of you who rely on UltraDev will be pleased to see more options for building dynamic Web applications in Dreamweaver MX. The program supports Active Server Page (ASP), Java Server Page (JSP), and Cold Fusion pages—three technologies UltraDev understood—and it can build pages that work with the PHP scripting language, MySQL databases, and Microsoft's new ASP.NET technology.

Dreamweaver MX includes other useful tools for dynamic Web development—for example, the new Database panel lets you set up connections to a database and view a tree structure of the database's tables. Expanding a table allows you to view individual fields that include informative icons and descriptions, which identify the kind of data each field stores (for example, integer or text).

Dreamweaver MX also has a slew of features for working with Cold Fusion, Macromedia's Web-application server. If you're a Cold Fusion user, you'll find your work going more quickly with MX's new easy setup for Cold Fusion MX, built-in Cold Fusion debugger, and support for Cold Fusion MX components. In addition, the Cold Fusion code Dreamweaver produces is much cleaner and more readable than similar code produced by UltraDev. JSP developers will find new features that speed application development by taking advantage of pre-programmed Java components. You can import JSP tag libraries from a variety of files—even from the Web—and then use Dreamweaver MX's code-writing tools to access those tags. In addition, Dreamweaver MX lets JSP developers quickly build Web applications using JavaBeans. Whether you (or a programmer on your staff) do the programming or you use commercially available JavaBeans, Dreamweaver MX can inspect the methods and properties of a JavaBean, and it can set and get a JavaBean's properties—all within a graphical interface.

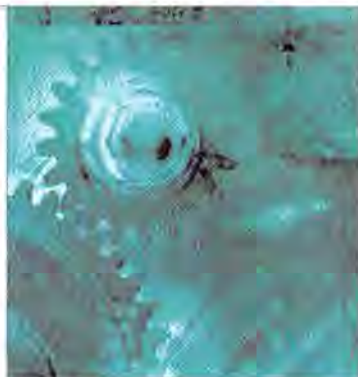
A Second Wind for Hand-Coding

Dreamweaver is often lauded for its visual-design tools that show on screen what a browser will display, while hiding the messy HTML that makes it all happen. However, with many new code-writing enhancements, Dreamweaver MX demonstrates Macromedia's commitment to those who hand-code.

Taking the Hint When you type HTML in Dreamweaver MX's Code view, *code hints* help you quickly complete HTML tags. Say you start to add a link to your Web page by typing the opening part of the anchor

tag, **<a**. Dreamweaver automatically opens a small menu that lists all of the possible attributes of that tag, such as **href**. You can either use the down-arrow key to scroll to the property you want to add, or type the first few letters to jump to the property name. Press the return key, and Dreamweaver drops in the property name for you. For quick production when using CSS, begin to add a CSS style to a tag by typing **class=**, and Dreamweaver brings up a list of all the class styles available to that page. This productivity tool—a feature not even supported in the ruling Mac text editor, BBEdit—will save hand-coders' time and fingers.

The Color of Code The new code-coloring feature lets you control tag color in 20 different types of documents, from HTML pages to JavaScript files. You can fine-tune the presentation of each tag, so it's easy to scan code and locate different types of tags. For example, you could make HTML comments jump out in red, and quiet **<p>** tags recede in a light gray.



Tracking Your Tags At times, even seasoned hand-coders need a way to see the big picture. The new Tag Inspector shows you a tree view of all the tags in a page so you can investigate a document's structure. Click on a tag, and a second panel shows all the possible attributes for that tag; you can then set or edit values for each property. Think of it as a beefed-up Property Inspector. Because Dreamweaver supports other tag-based document types such as XML and Cold Fusion, you can also use the Tag Inspector to analyze their structures and alter their properties.

Even if you aren't a hand-coder, you can use the new Tag Libraries feature to fine-tune the appearance of every tag Dreamweaver writes. For instance, say your company style guide requires that every **<p>** tag appear on its own line, that paragraph content start on the next line and be indented, and that the **</p>** tag appear on its own line. It's easy to set up the Tag Library edi-

New View The revamped New Document window in Dreamweaver MX lets you create a variety of document types—HTML, XHTML, and JavaScript—and open predefined CSS, Frameset, and Web-page documents.

<< tor so that Dreamweaver writes code your way each time it adds a new paragraph.

Other New and Improved Features

Veteran Dreamweaver users who are already masters of setting up sites, but who aren't looking for database-driven Web pages, may wonder whether Dreamweaver MX is a worthwhile upgrade. But it also has several new features and improvements to Dreamweaver favorites.

Parlez-vous XHTML? If you're a Dreamweaver 4 user, you'll immediately notice Dreamweaver MX's polyglot abilities: you can open, edit, and export HTML files, and Dreamweaver MX works with XML, Java, ActionScript, WML, and C++ files—to name just a few. Dreamweaver MX keeps up with the times by letting you create and edit XHTML files. XHTML, the Web-page format currently endorsed by the World Wide Web Consortium, is considered the next step in the transition from HTML

Macromedia Fireworks Gets the MX Treatment

Fred had Ginger. Laverne had Shirley. Lassie had Timmy. Some couples are more than the sum of their parts. So when Macromedia started to update its popular Web-publishing software, it knew it needed a super-charged image editor to go with it. Fireworks MX, which will be released at the same time as Dreamweaver MX, includes several new features, as well as improvements that promise to give Web designers more control over their graphics while requiring less work. Although the program is still in beta form, here's a look at what you can expect.

Interface Updates

Some of Fireworks' improvements appear in its retooled interface, which reduces mouse clicking and makes building Web graphics more intuitive.

All Together Now One change that had us cheering is the addition of a Property Inspector similar to the one found in Dreamweaver. The Property Inspector displays all of the available options for a selected tool or object. This means no more endless switching between multiple panels to complete even the simplest task. For example, to draw or modify a shape in previous versions of Fireworks, you needed to go to the Stroke, Fill, Effect, Object, and Info panels. Now you can set all of these attributes from the Property Inspector.

If your Web graphics incorporate both bitmaps and vectors, you'll be happy to know that Fireworks MX has at last eliminated the need to manually switch between different editing modes. Previous versions required you to double-click in the document window when you wanted to edit a bitmap image, and then double-click in it again to switch back to vector mode. Fireworks MX automatically switches between the two modes, depending on which tool you select from the toolbox. And to make your tool selection clearer, Macromedia has also rearranged the toolbox, physically separating the bitmap-editing tools from the vector tools (see "Retooling the Toolbox"). (The toolbox is now divided into four categories, and tools are grouped according to their purpose: Selection tools, Vector tools, Bitmap tools, and Web tools.)

Fireworks also has several new retouching tools in its bitmap-editing arsenal to give users more precise control over their images. The toolbox now includes Blur, Sharpen, Dodge, Burn, and Smudge tools. A new Gradient tool, which is coupled with the Fill tool, lets you quickly define and apply gradients to selected objects.

Quicker Text Editing Although the previous version of Fireworks offered extensive controls for designing text—including leading, kerning, and live effects—most users found the process cumbersome. To change a typo or the

text's size, for example, you had to open the Text Editor, make your changes, apply them to the document to gauge the result, and then close the Text Editor. But now you can create and alter text directly within the document window. The Property Inspector offers all the settings previously relegated to the Text Editor, as well as a few new options such as paragraph indents and spaces before and after paragraphs. And because no one is perfect, Fireworks MX comes with a spelling checker.

Navigation Improvements

One of the most important—and time-consuming—tasks of building a new Web site is creating clear and effective navigation. Fireworks MX offers several enhancements that simplify this process and give designers more flexibility.

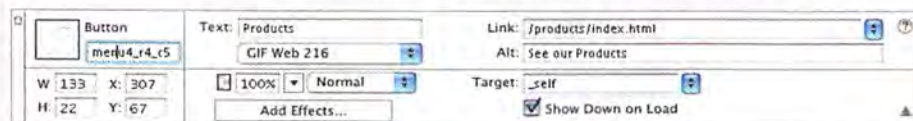
Symbols Save You Time Previous versions of Fireworks let you turn buttons—including rollover behaviors, Alt text, and assigned URLs—into symbols for later reuse. If you needed to make a change to text color, say, you could simply adjust the symbol, and the change would be reflected automatically in every button based on that symbol. This method was great for creating a single button that reappeared many times on the page. But because the symbol's instances all had to have the same text and attributes, this turned out to be less useful for creating navigation.

Fireworks MX solves this dilemma by adding variables to its button symbols. Each instance of a button can now contain its own text, URL, target, and effect (see "Better Buttons"). You can save time by creating a button once, then reusing it with variations throughout a site.

Powerful Pop-Ups For Web sites with multiple levels of navigation, pop-up menus provide an effective means of displaying submenus (and even sub-submenus) without forcing the user to click through several pages. Fireworks 4 introduced the Set Pop-Up Menu wizard, which let you quickly create basic pop-up menus without having to write the code yourself. But while Fireworks 4 made it easy for designers to create a menu, it offered them little flexibility in designing the menu's appearance.

Fireworks MX gives designers more control over pop-up menus by adding a set of advanced options to the Pop-Up Menu Editor. For example, whereas version 4 could create only vertical pop-up menus, Fireworks MX also offers the choice of horizontal menus. Using a set of four tabs, you can specify a menu's cell height, width, or padding; turn borders on or off; specify which direction a menu should pop up in; and even define how long the menu should remain visible before closing.

Better Buttons Now when you create button symbols, Fireworks MX lets you assign unique text, links, and effects for each instance of a symbol.



to XML; it provides cleaner code, more-accessible Web pages, and greater support for nontraditional Web devices such as PDAs and cell phones (see the online article "Making Sense of XHTML," www.macworld.com/2000/04/21/news/xhtml.html, and *Web Publishing Secrets*, December 2001).

Dreamweaver MX also includes a tool for converting a regular HTML file into an XHTML page, so you can bring older sites up-to-date. Don't worry about browser

compatibility—Dreamweaver MX uses a transitional form of XHTML that allows older browsers to display the pages as well. Unfortunately, you can update only one HTML page at a time; the program doesn't provide a tool for updating an entire site in one pass.

The Accessible Web and Valid Code So that you can better serve visitors with disabilities—and keep on the right side of regulations for government Web sites—Dreamweaver MX offers new tools for building Web sites that are compliant with Section 508 guidelines (see "Macs without Limits," *Secrets*, May 2002). By turning on a preference setting, you can receive prompts for adding accessibility properties when you insert images, tables, forms, and frames. In addition, you can generate a report that will analyze your site's accessibility.

And to help you wade through all the jargon, the reference panel includes the UsableNet Accessibility Reference, with explanations of potential usability problems and recommended guidelines for overcoming those problems.

For those concerned with Web standards, the new Validator tool lets you compare your code with a variety of different technical specifications, from HTML 2.0 to XHTML 1.0 Strict.

Snippets With capabilities borrowed from Macromedia's Web-page text editor, HomeSite, the new Snippets feature provides quick access to common code fragments. You can store bits of frequently used HTML—a copyright notice or a complex table design, for example—in the Snippets panel and, with a click of the mouse, drop them into any Web page.

MX ships with hundreds of prewritten Snippets, from basic designs for footers and tables to complex JavaScript functions for working with images, numbers, and cookies. And like many other MX features, you can go to Macromedia's Exchange Web site to download additional Snippet files.

Better Than Ever The engineers at Macromedia cleaned up the application's interface and several features, which are now highly functional, if not flashy. The revised interface is consistent with all of Macromedia's MX product line, so using Flash MX, Fireworks MX, and Dreamweaver MX doesn't require learning three different interfaces. Rather than displaying a dozen floating panels, Dreamweaver MX keeps most panels in Panel Groups, which are docked neatly along the right edge of the screen. In keeping with Dreamweaver's history of customization, you can hide panels, rip them out of their group and put them in free-floating windows, and even rearrange and rename Panel Groups.



Import and Export Options

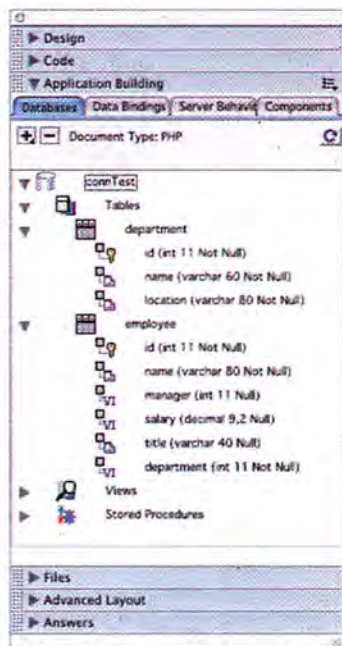
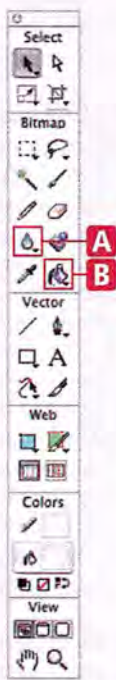
If you've ever been faced with the job of updating a Web site that no longer contains the graphics' original source files, you know how traumatic it can be to re-create those files. In these cases, Fireworks MX can save you sleepless nights with its new Reconstitute Table feature. Located under the File menu, this feature lets you open any HTML file—not just files written in Dreamweaver—that contains a table with image slices. Then Fireworks seamlessly joins the slices and creates one new PNG source file—including any rollover effects, pop-up menus, or animations. Although the page's text and vectors will no longer be editable, you can readjust slices and add new elements to the design.

With its new Data-Driven Graphics wizard, Fireworks MX also lets you quickly create and export multiple variations of the same design. Using this wizard, you can take an XML file of variables (such as car models, options, and prices), select a folder of images (say, car product shots), and automatically create dozens of versions of the same ad with specific details for each car. If you maintain a site with graphical ads that change frequently, the Data-Driven Graphics wizard could save you a lot of time.

MX Has More to Offer

While many of the program's new timesaving features will be impossible to miss (for example, the Property Inspector), Fireworks MX also comes packed with plenty of smaller improvements that will shave valuable time off your workday: you can merge layers; save selections for later reuse; access a Quick Export menu in the upper-right corner of the document window; and use a new Open Recent option in the File menu to quickly access frequently used documents. Together, all of these nips and tucks make Fireworks MX a more efficient tool for designing Web graphics and a valuable member of Macromedia's power couple. —KELLY LUNSFORD

Retooling the Toolbox In Fireworks MX, tools are grouped according to their function. The new Blur Tool **A** also contains Sharpen, Dodge, Burn, and Smudge tools. A Gradient tool is now located with the Fill tool **B**.



The Databases Are Loaded The new Databases tab lets you create connections to databases and explore a database's tables, columns, and data types.

Macromedia renamed the old Objects panel; it's now called the Insert Bar, and it's located at the top of the screen. Objects are now grouped under easily accessible tabs, instead of in the tiresome pull-down menu of previous Dreamweaver versions.

The engineers also improved Dreamweaver MX's code generation. For example, Dreamweaver 4 often produced unwieldy HTML when you resized table cells and columns—one simple drag could add all sorts of unnecessary width and height properties to table cells. In Dreamweaver MX, the rules governing these updates are improved, producing much cleaner code.

Macromedia completely reworked the CSS Styles panel as well. With separate panes for applying and editing styles, Dreamweaver MX offers a simplified approach to using CSS. In addition, its Design view more clearly displays CSS properties such as float, background image, borders, padding, and CSS positioning. Heavy CSS users will appreciate Dreamweaver MX's more accurate rendering of their designs. But the program doesn't perfectly mimic the latest Web browsers; you'll still have to make frequent trips to Internet Explorer, Opera, and Navigator to see how your CSS designs will turn out.

One of the most exciting updates is the reworked Templates feature (see "Refine Dreamweaver MX's Templates to Gain Power"). Templates in Dreamweaver MX have gotten a lot smarter and a lot more flexible.

But one feature didn't get the same level of attention. Dreamweaver Behaviors have always been a popular way for designers and nonprogrammers to add basic Java-

Script functionality to a page, from roll-overs to advanced DHTML (dynamic HTML) animations. Dreamweaver has only one new behavior, but it's a good one—the Show Pop-Up Menu behavior lets you build DHTML-based pop-up menus, normally complex JavaScript challenges.

Web Development in OS X

If you already use Macromedia products to develop Web sites, it's time to go native. Dreamweaver MX is OS X native, and it includes OS X-specific improvements such as a rewritten FTP engine for more-efficient file transfers to and from a Web server. If you also use Fireworks MX, you may be able to say good-bye to OS 9.

Pulsing liquid-filled buttons aren't the only benefit of an OS X Web-development system. Due to OS X's Unix underpinnings, you can create a powerful Web server system complete with a MySQL database and a PHP or JSP application server right on your desktop. Add Dreamweaver MX's dynamic tools to the mix, and you'll be building complex database-driven sites with the very technologies Fortune 500 companies use.

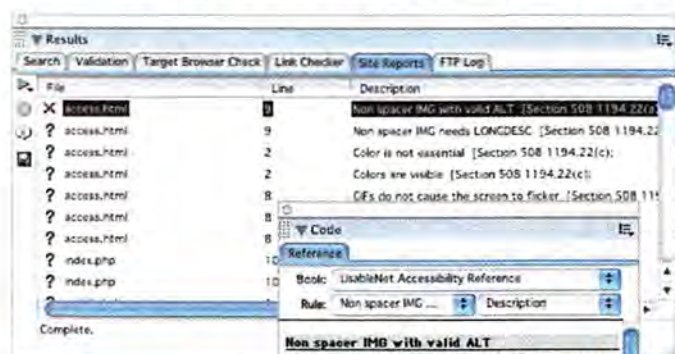
This may come as a welcome relief to those UltraDev users who had to network to a Windows machine just to build a database-driven Web site. In fact, if you host your site with a commercial Web hosting company, you'll probably be able to take advantage of a low-cost solution for building a dynamic Web site: PHP and MySQL are among the most common and least expensive options available from commercial Web hosts. Imagine that: develop entirely on a Mac, forget about Windows, and save money. Is it Christmas already?

The Last Word

There's plenty to talk about in this latest release. It feels as if Macromedia has loaded this program with everything *including* the kitchen sink. But that's no guarantee that what you were waiting for is here. For longtime Web developers who haven't built a dynamic, database-driven Web site, the new Web-application-building tools may be inspiring, but they may leave you wondering why Macromedia didn't put more effort into improving what was already there. The simplified start-up features may get newbies off and running only to crash into more complex concepts and technologies.

There may be some grumbling on all sides. But whatever your opinion, it's safe to say that Dreamweaver MX is more powerful than its predecessor, with an impressive new feature set that continues to keep pace with the latest trends, technologies, and standards. □

DAVID SAWYER MCFARLAND is the author of the forthcoming *Dreamweaver MX: The Missing Manual* (O'Reilly/Pogue Press, 2002).

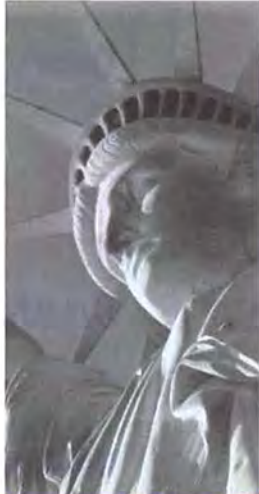


Easier Accessibility

Macromedia has added an Accessibility option to Dreamweaver's Site Reports feature; it checks whether your site is compliant with Section 508 accessibility guidelines. To help you unravel the report, the Reference panel now includes the UsableNet Accessibility Reference, which has descriptions of accessibility errors and guidelines for fixing them.

Macworld

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EXPO CONFERENCE

Conferences **July 15–19, 2002**

Expo **July 17–19, 2002**

Jacob K. Javits Center **New York**



Overview

Macworld Conference & Expo™

Join us and expand your Macintosh horizons!

Conferences: July 15–19, 2002

The world's best education and training program is designed exclusively to serve the needs of all Macintosh users. As it has over the past eighteen years, Macworld Conference & Expo continues to build and expand its conference program to ensure you receive fresh and the most up-to-date training available.

In addition to its industry staples — Macworld/Pro, Macworld/Users, Workshops and MacBeginnings — we're excited to announce two new programs: Macworld/Power Tools conferences and Hands-on MacLabs. When combined, Macworld Conference & Expo's Conferences will prove to be the most comprehensive and customized education to maximize your time and develop your techniques. Learn how to make the most of the industry's most popular tools and applications, hear about innovative solutions, or broaden your general knowledge. Leave with skills that can be immediately applied when you return to the office or home.

macworldexpo.com
Visit www.macworldexpo.com for full conference details!

Exposition: July 17–19, 2002

Macworld Conference & Expo is the largest technology event in New York, and a must-attend gathering for the Mac community. Hundreds of companies and thousands of products and services are showcased in an interactive, all-in-one marketplace not found anywhere else. Get personal hands-on experience with the latest products and services designed to improve both your business and home life.

At Macworld Conference & Expo you can:

- Test-drive the new products and services you're interested in before you buy them
- Discuss your issues and glitches directly with the manufacturers of your favorite products
- Network with your peers and learn what makes their Mac experience great
- Pick the brains of the industry's leaders and professionals
- Hear new product announcements first

If you are interested in staying on the cusp of technology, this is the event to attend.

REGISTER ONLINE

with Priority Code **A-MWY** by June 17, 2002
for the Early Bird Discount!

Dates & Times

Keynote*

Wednesday, July 17 9:00 am – 10:30 am

Feature Presentation*

Thursday, July 18 9:30 am – 10:30 am

Macworld/Power Tools Conferences

Monday, July 15 9:00 am – 6:00 pm

Tuesday, July 16 9:00 am – 6:00 pm

Workshops

Tuesday, July 16 10:00 am – 5:00 pm

Macworld/Pro Conference

Wednesday, July 17 12:30 pm – 5:30 pm

Thursday, July 18 11:00 am – 4:45 pm

Friday, July 19 9:00 am – 12:15 pm

Macworld/Users Conference

Wednesday, July 17 12:30 pm – 4:45 pm

Thursday, July 18 11:00 am – 5:15 pm

Hands-on MacLabs

Friday, July 19 9:00 am – 1:00 pm

MacBeginnings

Wednesday, July 17 1:00 pm – 2:00 pm

3:00 pm – 4:00 pm

Thursday, July 18 11:00 am – 12:00 pm

3:00 pm – 4:00 pm

Friday, July 19 11:00 am – 12:00 pm

1:00 pm – 2:00 pm

Exhibit Hall

Wednesday, July 17 10:30 am – 6:00 pm

Thursday, July 18 10:00 am – 6:00 pm

Friday, July 19 10:00 am – 4:00 pm

On-site Registration Hours

Monday, July 15 8:00 am – 6:00 pm

Tuesday, July 16 8:00 am – 6:00 pm

Wednesday, July 17 7:00 am – 6:00 pm

Thursday, July 18 8:00 am – 6:00 pm

Friday, July 19 8:00 am – 3:00 pm

*Keynote and Feature Presentation are open to Platinum Pass, Super Pass, Pro Conference, Power Tools Conferences, Users Conference, Workshop and Hands-on MacLab attendees ONLY. Seating is on a first-come, first-serve basis except for Platinum and Super pass attendees who have access to VIP Keynote seating.



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Don't miss these special show attractions in the Exhibit Hall:

Special Interest Areas

Macworld Conference & Expo's Special Interest Areas feature the coolest Mac developers, all boasting products that span a wide array of needs and interests.

The Special Interest Areas will showcase Mac developers who specialize in the following types of products and solutions:



Digital Media

Apple continues to lead the way in providing the industry with a standard method of handling video, sound, animation, graphics, text, and even 360-degree virtual reality scenes on the desktop. This capability allows professionals and Mac users to share and distribute media-rich content to colleagues, friends and family anywhere, anytime. Here you will find the most innovative companies exhibiting cutting-edge applications and solutions for creating, editing, storing and delivering digital media content with Apple's QuickTime™ technology.



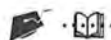
Small Business

This highly educational, informative and interactive area will showcase developers with products, applications, and services geared toward Mac-based small businesses, entrepreneurs and home offices. Learn how productive your company can be with Mac at the helm! Here you will find business products and applications spanning across areas such as inventory control, finance management, online services, and medical office management solutions.



Sci-Tech

Innovative Apple technologies make Power Macintosh computers the prime choice for scientists and researchers. Here you will be able to test-drive a broad collection of hardware and software for mathematics, the pure sciences, engineering, and data visualization. Researchers, scientists, educators and students will find plenty to stimulate the cerebral cortex.



Education/Assistive Technology

This area focuses on the needs of teachers, students, parents and administrators, showcasing products such as software, Internet tools, curriculum building solutions, and multimedia for schools, training, K-12 and higher education. In addition, you will find computerized assistive technologies consisting of hardware and software solutions that meet the needs of students and others with learning and physical disabilities. Here, developers and solution providers alike will demonstrate their support for the Mac platform and the advances of these educational technologies.

Internet Café

The Internet Café is one of many resource areas Macworld Conference & Expo provides to help make the most of your event experience.

Located in the Exhibit Hall and available to all registered attendees, the Internet Café offers a comfortable setting for checking your email, accessing the Internet, grabbing a snack or cup of coffee, chatting with your friends and colleagues, or just relaxing.

Apple Solution Experts – Free Technical Advice!

One of the most popular resource areas in the Internet Café is the Apple Solution Experts counter. Apple Solution Experts are independent consultants, trainers, and resellers specializing in Apple products and solutions who offer free technical support to Macworld Conference & Expo attendees! Take advantage of this opportunity to get help directly from an expert.

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Macworld Conference & Expo Guided Tours

Due to continuous rave reviews, the Macworld Conference & Expo Guided Tours, both individual and group tours, will be available again.

Whether you are a new attendee at Macworld Conference & Expo, or a returning Mac user, Apple User Group volunteers will help you find the products, services, solutions and companies you want to see in the Exhibit Hall. These knowledgeable guides will assess your needs and escort you right to what's hot, help you find seats for floor demonstrations, and bring you to the experts who have the answers to your questions. We urge you to take advantage of this valuable free service.

NEW

for New York!

Plan Your Exhibit Hall strategy and who you're going to see by using our My Briefcase program at www.macworldexpo.com/

Macintosh Gaming Area

Join the top game publishers as they reveal the best new titles for Mac OS X.

Experience gaming hands-on in the Mac OS X Game Arcade, and watch publisher presentations of the hottest new games in the Mac Gaming Theater. Both the Mac OS X Game Arcade and Theater are sponsored by Apple.

The Macintosh Gaming Area offers you the opportunity to discover why gaming on the Mac is the best it's ever been!

Digital Art Contest & Gallery

The Macworld Conference & Expo Digital Art Gallery again will promote art via the Mac. By utilizing the new speeds of the Macintosh and increasingly innovative graphics software, artists are able to produce masterpieces that are getting the attention of the art world and Macworld Conference & Expo attendees.

The 2002 Digital Art contest is judged by some of the digital art community's most respected leaders who choose 30 digital masterpieces. Winning artwork will be displayed in a gallery setting in the Exhibit Hall at Macworld Conference & Expo/New York 2002. The Gallery will then travel across the country to galleries and other venues, including Macworld Conference & Expo/San Francisco 2003.

Sponsored by



For more information about the contest, call for entries, and the gallery, please see www.macworldexpo.com/gallery



Macworld/Power Tools Conferences

for New York! **Macworld/Power Tools Conferences**

Monday, July 15 – Tuesday, July 16

We're excited to introduce you to our brand new Macworld/Power Tools Conferences. By participating in one of these conferences, you will benefit from two days of intensive training on your favorite application or tool, interacting one-on-one with your peers, and tapping the minds of industry experts.

PA The Macworld Conference on Professional Photoshop

Michael Ninness, LiveMotion Group Product Manager, Adobe Systems, Inc.

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

PB The Macworld Conference on Final Cut Pro

Josh Mellicker, President & CEO, DVcreators.net

Final Cut Pro is the video creation software that has finally delivered on the promise of the DV Revolution. With power, speed and features worthy of far more expensive software, Final Cut Pro offers a true high end editing environment at a very down-to-earth price point. Come join Josh Mellicker and Guy Cochran from DVcreators.net, the world's top Final Cut Pro gurus, for a two-day conference that will empower you to navigate Final Cut Pro's treacherous learning curve with ease and clarity. Whether you'll be creating corporate training videos, feature films, educational videos, marketing CD-ROMs, documentaries or web video shorts, this conference will reveal a vast landscape of possibilities with this powerful video creation tool.

See session offerings and learn more about the instructors at www.macworldexpo.com

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PC The Macworld Conference on FileMaker Pro

John Mark Osborne, Owner & President, Database Pros; Partner Level FSA Member

FileMaker Pro is the most dominant software application on the Macintosh, garnering more than 90 percent of Macintosh database sales. On the Macintosh, FileMaker is the definition of database. FileMaker is also a mature product line with a developer version, a server version, support of ODBC, JDBC, XML, Citrix and many other technologies, integration ability with the web, connectivity to Palm and a developer community of nearly 10,000. Come and learn about the exciting world of FileMaker Pro with the world renowned FileMaker experts.

PD The Macworld Conference on DVD Studio Pro

Bruce Nazarian, President, Gnome Digital Media

DVD Studio Pro is one of the most exciting new software applications on the Macintosh, helping to drive the DVD Revolution. On the Macintosh, DVD Authoring takes on a simplicity and ease-of-use that is rapidly gaining favor and winning converts from other platforms. Come and learn the exciting new application DVD Studio Pro with a panel of respected DVD experts.

PE The Macworld Conference on AppleScript

Sal Soghoian, AppleScript Product Manager, Worldwide Product Marketing, Apple

In the nine years since its inception, AppleScript has established itself as a platform differentiator for the Mac OS. Widely used by individuals, companies, and corporations to automate essential tasks and production issues, AppleScript provides unprecedented system-level accessibility to those ambitious enough to learn its intricacies. Now incorporated into nearly every corner of the Mac OS and widely supported by third party applications, AppleScript and its powerful OS X development environment, AppleScript Studio, saves Mac professionals time and money every day. Macworld Conference & Expo is pleased to present the very first conference on AppleScript to its attendees! This conference assumes intermediate to advanced experience with AppleScript.

Conference Packages

Platinum Pass

2 Day Macworld/Power Tools Conference
(select topic)
3 Day Macworld/Pro Conference
2 Day Macworld/Users Conference
Keynote VIP seating*
MacBeginnings Feature Presentation*
Lunch Birds of a Feather Meetings
Exhibit Hall

Super Pass

3 Day Macworld/Pro Conference
2 Day Macworld/Users Conference
Workshop (select topic)
MacBeginnings Keynote VIP seating*
Lunch Feature Presentation*
Exhibit Hall Birds of a Feather Meetings

Macworld/Pro Conference

3-Day Macworld/Pro Conference
Keynote* Feature Presentation*
MacBeginnings Birds of a Feather Meetings
Lunch Exhibit Hall

Macworld/Pro Conference – Day Pass

1 Day Macworld/Pro Conference
(select day: Wed, Thurs, Fri)
Keynote* Feature Presentation*
MacBeginnings Birds of a Feather Meetings
Exhibit Hall Lunch (on selected day only)

Macworld/Power Tools Conferences

2 Day Macworld/Power Tools Conference
(select topic)
Keynote* Feature Presentation*
Lunch Birds of a Feather Meetings
MacBeginnings Exhibit Hall

Full Day Workshops

Workshop (select topic)
Keynote* MacBeginnings
Lunch Feature Presentation*
Exhibit Hall Birds of a Feather Meetings

Macworld/Users Conference

2 Day Macworld/Users Conference
Keynote* Feature Presentation*
MacBeginnings Birds of a Feather Meetings
Exhibit Hall

Hands-on MacLabs

Half-day Hands-on lab
Keynote* Feature Presentation*
MacBeginnings Birds of a Feather Meetings
Exhibit Hall

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

Macworld Conference Programs

Macworld/Pro Conference

The Macworld/Pro Conference offers content rich, technical sessions designed for the professional Macintosh user or manager.

July 17–19

Track Descriptions:

Macintosh Networking & Communications Track

This track presents techniques and technologies associated with deploying Macintosh LANs, WANs, and Internet/Intranet access. These technical presentations take you inside the protocols and services you encounter when deploying connected Macintosh.

Digital Video Track

The Mac is a mainstream tool in the digital filmmaking arena. Apple technology provides best of class tools to produce and deliver the highest quality content. This track mixes practical tools advice with brilliant industry perspectives to deliver a composite picture of creating and distributing successful digital video projects.

Professional Publishing Track

Hear from industry experts how to be more profitable, efficient, competitive and employable in the creative arena. You'll gain knowledge that will help you run a leaner, meaner and more productive creative group.

Mac OS X In-Depth Track

This track of advanced sessions takes you under the hood of Mac OS X — the new operating system for the Macintosh. You'll learn about Mac OS X's Unix heritage and why this is important for advanced usage and management mastery. Also covered are sessions on how popular add-on technologies like AppleScript and Java are affected by OS X.

The Mac Manager Track

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

Please note: All educational programs, sessions and instructors are subject to change. Please see www.macworldexpo.com for the most up-to-date information.

Macworld/Users Conference

The Macworld/Users Conference offers the best opportunity to get a taste of Mac OS X, learn how to make desktop movies, make the most of digital photography and get tips on your favorite applications. Discover what we have to offer!

Wednesday, July 17

- S01** Making the Transition to Mac OS X
- S02** The Beginner's Guide to Music on the Mac
- S03** Science Education
- S04** Living the Digital Lifestyle with iMac
- S05** Your New iMac — Inside and Out
- S06** Photoshop Digital Creation: Uncanny Realism
- S07** Inside AppleScript Studio
- S08** Learning to Use a DV Camera
- S09** Getting Started with iPhoto
- S11** Using the Classic Environment in Mac OS X
- S12** Mac OS X for Musicians
- S13** Transitioning to Mac OS X in Higher Education
- S14** The Digital Archiving of Family History, Part 1
Planning Your Project: Ideas and Examples
- S16** Marketing with Mac OS X for Consultants
- S18** Dynamic Messages/Narrow Pipe
- S17** A Voyage with Darwin
- S18** Making iMovies with David Pogue
- S19** Extending iPhoto
- S21** Mac OS X Web Server Administration Using 3rd Party Tools
- S23** Wireless Networking Essentials
- S24** The Digital Archiving of Family History, Part 2
Designing Your Project: Techniques, Procedures and Resources
- S25** Mac OS X — PC Integration Issues
- S26** Creative Thinking in Photoshop: A New Approach to Digital Art
- S27** It's the FONTS!
- S28** Editing Techniques for iMovie
- S29** Everything You Always Wanted to Know About iPhoto

Thursday, July 18

- S31** How the Pros Troubleshoot Macintosh
- S32** How to Set Up a Home Recording Studio
- S33** DV Technologies in the Classroom
- S34** PalmPilot & Macintosh — A Match Synched in Heaven
- S36** Just Flash It!
- S38** Getting Started with Home Movie Making
- S39** From 0 to 360 Degrees in QuickTime VR
- S41** Troubleshooting Mac OS X
- S42** DVD Audio Considerations for Musicians and Filmmakers
- S44** Total Communications: Integrating Voice, Data, & Applications for the Home & Small Business
- S45** Putting Your Small Business Community on the Web: What the Web Can, and Can't Do, for Your Business
- S46** Energizing Flash Projects
- S47** Microsoft® Office v. X for Mac
- S48** Shooting Great DV
- S49** Cubic Panos in QuickTime VR
- S51** Mac OS X Freeware, Shareware, & Otherware
- S52** Audio CD Mastering for Musicians
- S53** Macworld Conference & Expo Gaming Round-Up
- S54** How and Why to Wirelessly Network Your Home or Office
- S55** QuickTime Pro Tips and Tricks
- S57** Microsoft® Entourage™ X for Mac
- S58** Getting the Most Out of iMovie: Tips and Tricks for Advanced Movie Making
- S59** Making Great Visual QTVR
- S61** Best of Mac Secrets
- S63** Distance Learning on the Mac
- S64** Your First DVD
- S65** Authoring Interactive QuickTime with Adobe GoLive 6
- S66** Inside Photoshop for Mac OS X
- S68** Filmmaker in 60 Minutes

Please see www.macworldexpo.com for more details about these exciting sessions and instructors.

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for New York! Hands-on MacLabs

You asked for it! The half-day Hands-on MacLabs provide hands-on computer training on key applications and tools. Our trainers are experts in their fields and they are prepared to share their knowledge with you. So select a discipline to focus on and bring your laptop! See complete descriptions and what you'll learn in a Hands-on MacLab at www.macworldexpo.com.



Friday, July 19

LA Flash 5 ActionScript for Designers

Rich Shupe, President, FMA

The next step for designers and scripters alike, this lab presents an introduction to Flash 5's scripting language. ActionScript makes it possible to manipulate Flash objects without the constraints imposed by a preset timeline. It also provides a variety of additional features not available using traditional animation techniques. This means designers can enhance Flash sites with improved user interactivity, on-the-fly customization, and compelling graphic experiences. Basic skills learned in this hands-on lab will even lay the groundwork for moving on to more advanced Flash programming techniques such as parsing external data, client-server communication, and more. Make your Flash sites more exciting, more useful, and more reusable with ActionScript.

Level: Beginner

LB Get "Author-ized" with DVD Studio Pro!

Bruce Nazarian, President, Gnome Digital Media

Here is your chance to hit the ground running, by attending special DVD Studio Pro training sessions with Bruce Nazarian, "the DVD Guy." You'll get invaluable basic DVD authoring insight while getting hands-on experience with Apple's powerful new authoring application, DVD Studio Pro. Knowledge of Mac operation and Adobe Photoshop 5.0 or 6.0 will be helpful.

Level: Suitable for Beginners, yet helpful for Intermediate Authors as well

LC Hands-on Mac OS X for Administrators

Schoun P. Regan, CEO, The Mac Trainers, Inc.

Mac OS X is making inroads into many schools and businesses, and support professionals in IT departments must learn how to manage this new operating system. This lab is designed to give support professionals and administrators the information necessary to maintain and support Macintosh computers running Mac OS X. Attention will be paid to running applications within the Classic environment, basic UNIX troubleshooting, networking, file and folder permissions, the domain structure of OS X, and must-have third party solutions.

Level: Intermediate

LD Acrobat in the Trenches: Combat Training for PDF Production

Hal Hinderliter, Hinderliter Consulting & Creative Services

While many of us still have trouble creating and printing PDF files, some companies are winning the productivity war with this powerful yet complex format. This hands-on course by Macworld Conference & Expo's resident Acrobat expert offers a two-stage approach to improving your PDF skills: first, you will learn how to configure Adobe Acrobat to quickly create perfect PDF files for web and print distribution; then, we'll explore plug-ins (such as EnFocus PitStop) and other techniques for editing and correcting PDF problems to achieve successful output. It's four hours of concentrated learning from an instructor with an international reputation for effective classroom training and when the smoke clears, you'll understand Acrobat like never before!

Level: Beginner

LE Final Cut Pro Hands-on – The Director's Cut

David Barrett, CEO, R/com Networks, Inc.

If you're interested in using Final Cut Pro to edit a video or motion picture project, there is no better option than this unique half-day course. This fast-paced hands-on class will show you what you need to know when cutting a project "the right way" is the difference between success or failure. You'll work with actual project footage, explore cutting, timing, problem solving, multiple tracks, compositing, titling, sweetening, and layback to tape or DVD. Most importantly, you'll learn from an experienced award-winning video director and editor and a support team of video and film professionals.

Level: Beginner to Intermediate

Workshops

Tuesday, July 16

- WA** Advanced Webmaster Applications
Dori Smith
- WB** Practical Introduction to Mac Networking
Leon J. Albon
- WC** How to Create, Produce, Deliver Interactive Solutions
Nick Floro
- WD** Dr. Mac Presents: "How to Become a Mac OS X Power User"
Bob LeVitus
- WE** MultiNodes: The QuickTime VR SuperSession
Dennis Biela
- WF** QuickTime Professional's Workshop
Keith Hatounian
- WG** Mac Efficiency and Power User Tips
Deborah Shadovitz
- WH** Integrated Professional Publishing Tools
Sandee Cohen
- WI** Mac OS X In Depth
John C. Welch
- WJ** Chris Breen's Massive Mac Brain Dump From Punk to Power User in One Day
Chris Breen

* Please note: Each interactive lab requires a charged-up laptop with the appropriate software pre-loaded on the computer system. Please see www.macworldexpo.com for hardware, software and skills requirements. Hands-on MacLab topics and instructors are subject to change.

Early Bird Pricing available until June 17, 2002!

Register with Priority Code **A-MWY**

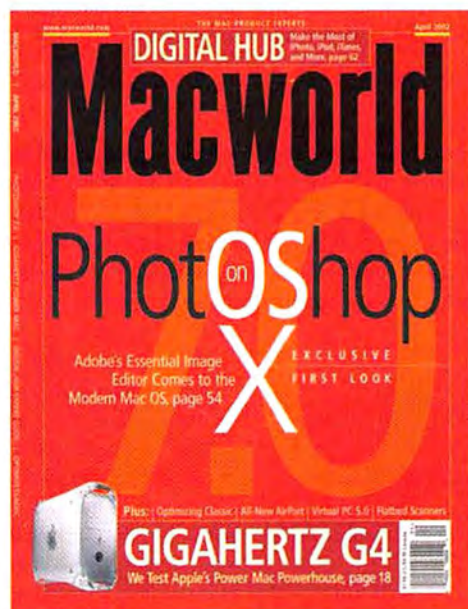


One thing remains the same



yesterday

today



We are the Mac Product Experts

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Streamline Your Routines

It can't be easy to design an operating system that works equally well for every kind of person, from third-graders to researchers working on the Human Genome Project. An everyday tool for one person is a hopelessly irrelevant feature for another. But with QuickKeys X, you can customize your Mac so it's more in step with your specific needs.

CE Software's QuickKeys (800/523-7638, www.cesoft.com) is a *macro* program, automation software that lets you pluck your favorite Mac features from where they're buried in the operating system and park them where you can get at them more easily—by pressing a key combination of your choice or clicking on a button in a custom-made toolbar, for example. For many people, QuickKeys represents the very first opportunity to actually *use* those function keys they've been staring at for years at the top of their keyboards.

QuickKeys X (which is for OS X only) offers fewer options than its OS 9 predecessor—no logical branching, no IF-THEN statements, and so on. On the other hand, it's easier to use. This little software

robot lets you string together long lists of tasks you'd rather not have to perform yourself.

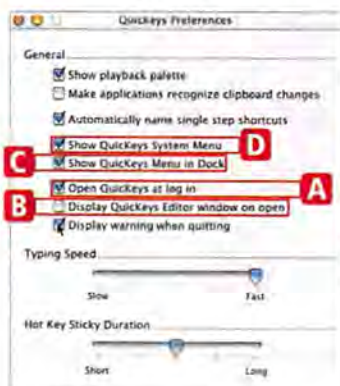
For example, QuickKeys X is ideal for automating your morning Mac ritual: downloading your e-mail, opening the three Web sites you check daily, bringing another Mac's hard drive onto the screen from across the network, and backing up files—all while you sit and sip coffee. (Before you begin, make sure you've updated to QuickKeys X 1.0.2, the latest version. The free update is available from CE Software's Web site.) □

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1

Set Up QuickKeys

If QuickKeys is to execute your every whim, it must be running in the background at all times, like a Mac OS 9 extension or control panel. In Mac OS X, of course, there's no such thing as an extension or control panel. But via QuickKeys' Preferences panel, you can make the program load automatically at start-up.



Open the QuickKeys menu and choose Preferences. To ensure that your macros are always available, turn on the Open QuickKeys At Log In option **A**. If you don't want to go through the hassle of hiding or minimizing the QuickKeys window every morning, deselect the Display QuickKeys Editor Window On Open option **B**.

For easy access to QuickKeys, turn on the Show QuickKeys Menu In Dock option **C**. Then make sure the Show QuickKeys System Menu

option is selected **D**—when it is, a menu of your automated tasks is displayed in the upper right corner of your screen.

When you're done, close the Preferences window. You're now ready to begin building your macros.

2

Launch Mail

You could construct your entire morning routine as a single, massive QuickKeys macro. But if you build it in chunks, you'll also have the option of triggering each task independently. The first step is to create a macro that opens your e-mail program—Apple's Mail or Microsoft's Entourage, for example.

Open QuickKeys by clicking on its Dock icon. The QuickKeys Editor appears on screen with a list of your current macros.

You use the Create menu **A** to build all macros; the task you want to complete will determine the menu option you should choose. In this case, you want QuickKeys to open your e-mail program. From the Create menu, choose System; then select Switch Applications from the System submenu.

The Switch To window offers several options for moving between applications. If you're running several programs, for example, you can flip from one to another, perhaps to the most recently used one. Or you can switch to a *particular* program, which is what you want in this case. Open the Action pop-up menu and choose Switch To Specified **B**.





To tell QuickKeys which program you want it to switch to, open the Switch To pop-up menu **C** and choose Select Other. Use the file directory to navigate to your e-mail program, and choose Open.

Then turn on the Open If Not Running option **D**. This ensures that the macro will work even if the e-mail program isn't open.

3 Check Your Messages

Just opening your e-mail program doesn't get you very far; you'll also want the macro to retrieve your mail. When people send you huge files that take a long time to download, you'll be grateful that QuickKeys kicked into gear while you were still eating your breakfast cereal.



To tack a new action onto your macro, click on the Show Steps Drawer button; its label then changes to Hide Steps Drawer **A**. A new panel slides open at the bottom of the window, revealing the individual steps this macro will perform. We don't have a very long list yet.

The best way to execute an action such as checking mail is to use the program's keyboard shortcut for that command. From the Create menu, choose User Actions and select Type Keystroke from that submenu.

In Apple's Mail program, ⌘ -shift-N is the shortcut for checking mail. In Entourage X, it's ⌘ -K.

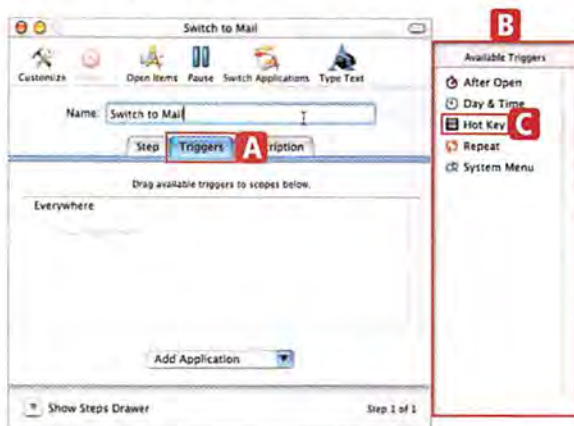
When the Type Keystroke dialog box appears, click in the Keystroke box **B** and press the appropriate keyboard shortcut. The action will be added to the Steps drawer.



4 Assign a Trigger

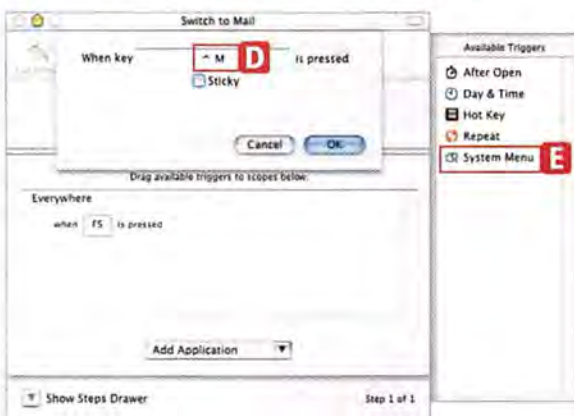
You've now created a macro that opens your e-mail and checks for new messages. But QuickKeys doesn't yet know when you want it to do all this. To put your macro to work, you need to assign it a *trigger*, an external action that tells it to get started.

When you click on the Triggers tab **A**, the Available Triggers drawer slides out **B**. The list of available triggers shows that QuickKeys can be told to run a macro just after a certain program opens, at a specified time of the day, when you press a certain key, and so on.



If you plan to run your e-mail macro only as part of your morning routine, it doesn't need a trigger. The larger morning macro will initiate it automatically. But if you want to be able to run your e-mail macro independently at other times of the day, you must assign it a trigger.

You can assign a keyboard command to your macro by double-clicking on Hot Key **C**, in the Available Triggers drawer. This opens the When Key Is Pressed panel.



In the new panel, click in the keystroke box **D** and then press the keys that should trigger your mail-fetching macro—control-M, for example, or F4. Then click on OK.

If you don't want to memorize a new keystroke, you can also double-click on System Menu **E** in the Trigger drawer. This places the macro's name in the QuickKeys menu at the upper right corner of your screen. Close the Switch To window.

5 Load Your Web Sites

Another common morning ritual is visiting a couple of Web sites for updates and news. QuickKeys can save you the time you'd spend waiting for those Web pages to download and open. It can have your favorite Web sites already loaded in different browser windows.

From QuickKeys' Create menu, open the Internet submenu and choose Web Address. In the Web Address window, click in the Web Address To Open box and type the URL of the first



Web site you like to visit each day **A**.

If you'd like to have multiple Web sites up and running, open the Steps drawer once again (so you can monitor your macro as you build it).

To open a second browser window in Internet Explorer, you might choose File:

New using the mouse. But keystrokes are always more reliable than mouse actions in macro programs, so use the ⌘-N key combination instead. Choose Create: User Actions: Type Keystroke, just as you did in step 3. This time, click in the Keystroke box and press ⌘-N. When you're done, click on OK.

So what should happen in that second browser window? You want to pull up the next site. Once again, open the Create menu and choose Internet: Web Address.

Enter the next URL you want to open. Repeat this process as many times as you like, until you've ensured that all your



favorite sites will be ready and waiting for you every morning. Your Steps drawer will look something like the one in our example **B**.

Opening these pages will be part of your master morning macro. But if you'd also like the option of triggering this macro independently, you can give it a keystroke of its own by repeating step 4.

Now you can click in the Name field and

give this macro a name—something like our example's Web Faves **C**. Close the Web Address window.

6 Bring Another Mac Online

If you're on a network, you might find it convenient to have instant access to another Mac's hard drive. Maybe you use it as a backup disk (see step 7), or maybe you just need to grab files from it occasionally. QuickKeys lets you dispense with typing in passwords and user names; you can summon the other Mac to your screen with a single keystroke.

The usual method for connecting to another Mac on your network is to open the Go menu and select Connect To Server. You then have to browse for the desired Mac, specify your name and password, choose the hard drive you want, and finally click on Connect—not exactly a swift kick in the pants for your productivity.

It can be, though. Before you begin automating the process with QuickKeys, you need to find out the other Mac's IP address—its network phone number, so to speak. In Mac OS X, open the Network pane of System Preferences. In Mac OS 9, open the File Sharing control panel. The IP address is

a set of four blocks of numbers separated by periods.

Once you have the IP address, return to QuickKeys' Create menu, scroll down to Network, and choose Servers.

In the Servers window, type the other computer's IP address **A**, the exact name of the disk you want to open **B**, and the user name and password you



would normally use to connect **C**. (To connect as a guest, you should leave the bottom two boxes empty.)

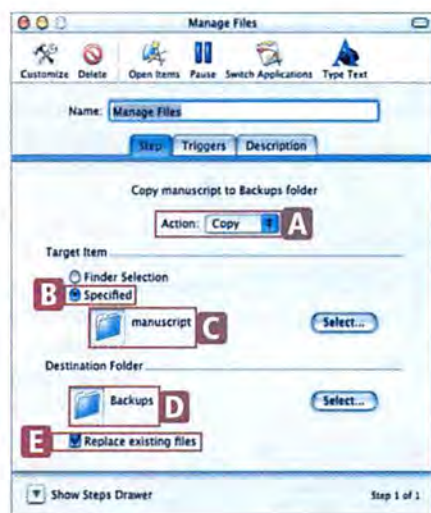
Now you can repeat step 4 to set up a keystroke trigger that will mount the other Mac on cue, or to add the macro to the QuickKeys menu in the screen's upper right corner. When you're done, close the Servers window.

7 Back Up Automatically

As long as you've summoned another hard drive to your screen, you may as well capitalize on its presence by backing up your stuff to it. For example, you may want to back up the current version of your novel manuscript before you begin your day's work on it. (You could also use this process to back up your entire Home folder. But because this might take a long time, making it part of an end-of-day macro may be better.)

QuickKeys makes it easy to copy files or folders to a predetermined spot. In QuickKeys, open the Create menu. From the Files submenu, choose Manage Files.

In the Manage Files window, tell QuickKeys what you want it to do with the files. Because you're creating a backup,



choose Copy from the Action pop-up menu **A**.

Next, specify which folder you want to back up. Select Specified **B**, and then drag your Manuscripts folder (or whatever you want to back up) from your Home folder directly into the Target Item well **C**.

Tell QuickKeys where to copy

that folder. The easiest way, once again, is to drag the icon of a backup folder from the networked Mac (whose hard drive you brought to the screen in step 6) into the Destination Folder well **D**. You'll also want to turn on the Replace Existing Files option **E** to make sure your backup disk always contains only one set of files—the most recent set.

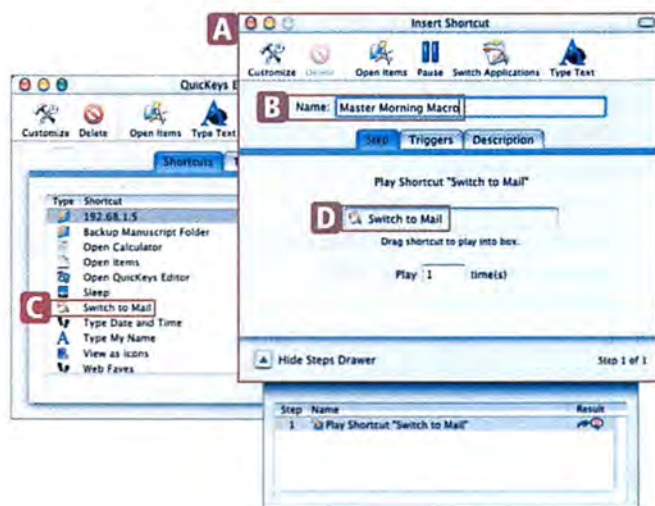
Adding a keystroke trigger for this step is—as usual—optional. To finish, give the macro an appropriate name and then close the Manage Files dialog box.

8

String Together the Pieces

Now that you've built all the individual pieces of your morning routine, you're ready to string them together into one massive, overarching, self-running macro. Then you can stand back and enjoy the ride.

Open the Create menu, and then open the QuickKeys submenu. Choose Insert Shortcut. The Insert Shortcut window will appear **A**. This will be the master shell into which you'll import all the individual macros you've built so far.



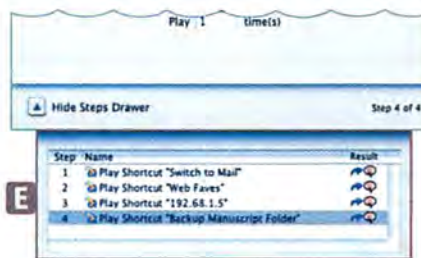
First type a name for your morning macro **B**. Position the Insert Shortcut and the QuickKeys Editor windows on screen so you can see both of them at once. (If the QuickKeys Editor isn't visible, choose it from the Window menu to bring it back.)

In the QuickKeys Editor window, find the first macro you'd like to run—the e-mail one **C**, for example—and drag it into the well **D** in the Insert Shortcut window. Open the Steps drawer so that you can see your ladder of tasks grow.

To add a second task to your morning macro (for example, Web Faves), go back to the Create menu and select Insert Shortcut from the QuickKeys submenu again. This time, you'll

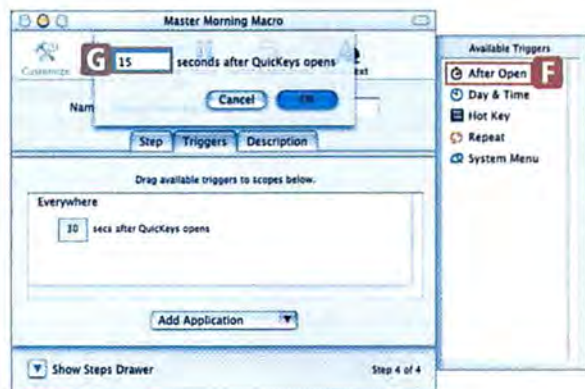
drag your Web Faves macro into the well.

Repeat this process for every macro you want to include in your morning routine. When the macro is complete, your



Steps drawer should look something like our example's **E**.

Click on the Trigger tab. This time, instead of selecting a keystroke to trigger your entire morning routine, you want to set the macro to trigger automatically when you log on to your computer in the morning. In the Available Triggers panel, double-click on After Open **F**. A new panel appears, asking how many seconds QuickKeys should wait before initiating the macro **G**. Type a number, such as 15, so that QuickKeys will run the master macro just after your Mac turns on and QuickKeys loads.



For testing purposes, add your macro to the QuickKeys System menu by double-clicking on System Menu in the Available Triggers panel. Close the Insert Shortcut window.

9

Test and Debug

You may not be aware of it, but you've just become a programmer. And part of writing self-operating software is, of course, testing and debugging it.

Quit all your programs except QuickKeys. From the QuickKeys System menu in the upper right corner of your window, choose your master morning macro.

As you watch, QuickKeys should open your e-mail program, download new messages, open the windows in your Web browser, bring up your networked Mac without bothering you for a password, and copy your Manuscripts folder to it.

If something goes wrong along the way, you have a few troubleshooting tools in your arsenal.

For example, sometimes QuickKeys needs to cool its jets for a moment while it waits for the Mac to complete one of its commands. If your Mac isn't the latest and greatest

G4 attached to a cable modem, QuickKeys may be slow to open three Web sites simultaneously and may need to pause between windows.

To insert a pause, open QuickKeys and double-click on the problematic macro in the QuickKeys Editor. Open the Steps drawer. Select the step just before where you want the pause to occur **A**;

then choose Create: QuickKeys: Pause (or click on the Pause icon at the top of the window **B**). QuickKeys will ask how many seconds you want the macro to pause before continuing with the next step.

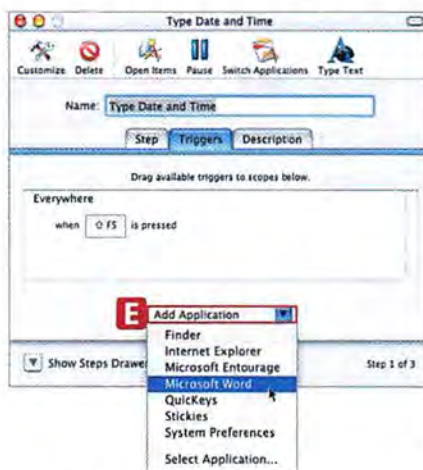
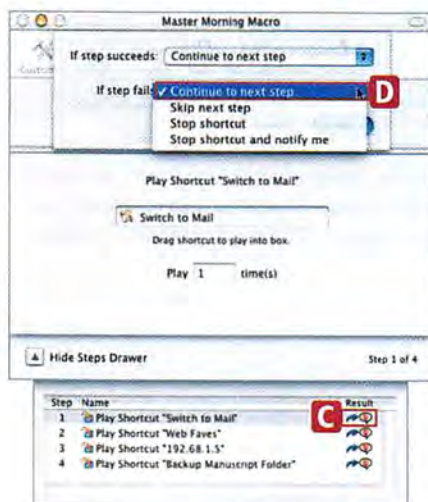
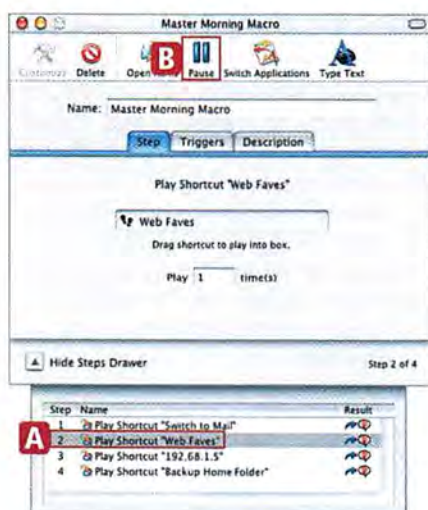
And here's another good debugging tactic: tell QuickKeys what to do if it can't complete one step before proceeding to the next. For example, if you connect to the Internet via a

dial-up modem and Mail can't connect, you don't want QuickKeys to interrupt the flow of your magnificent macro. In the Steps drawer, double-click on the Result icon **C** for the problem step. In the resulting dialog box, choose the If

Step Fails, Continue To Next Step option **D**, and then click on OK.

Finally, note that you can confine a certain macro so that it works only when you're in a certain program (instead of working systemwide, as the macros in this

tutorial do). In the macro's Triggers tab, use the Add Application pop-up menu **E**, to choose the program that the macro will apply to.



TOP 10 QUICKKEYS MACROS

Not all macros have to be sprawling, multistep jobs. Most of the world's best QuickKeys macros are short-and-sweet one-shot deals that make life easier. Here are some examples you may find useful—along with the Create-menu choice that will get you started with each one.

1. **Type your return address or a password**
(Create: Text: Type Text)
2. **Turn the escape key into a left-handed delete key**
(Create: User Actions: Type Keystroke)
3. **Paste the date**
(Create: Text: Date & Time)
4. **Hide all programs at once**
(Create: System: Computer)
5. **Shut your Mac down at midnight**
(Create: System: Computer)
6. **Play an AppleScript**
(Create: Scripting: AppleScript)
7. **Fire off an e-mail to a specified person or group without entering a name in the To field**
(Create: Internet: E-mail)
8. **In a program's Open or Save box, jump to a specified folder**
(Create: Files: Change Folder)
9. **Move a highlighted file to the Shared folder**
(Create: Files: Manage Files)
10. **Open the QuickKeys Editor**
(Create: QuickKeys: QuickKeys Actions)

Win an Apple iPod!
Details on page 57



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Add Video to Flash

If you want interactive Web sites with the eye-catching look of live action, Macromedia Flash and Apple's QuickTime video format are a powerful combination. And the recent release of Flash MX makes it easy to integrate QuickTime video into Flash. But you can also use QuickTime video indirectly, as a source for bitmaps or rotoscoping—techniques that work well no matter which version of Flash you have.

Using Video in Flash MX

Whether its purpose is to inform or to entertain, QuickTime video can add a unique dimension to a Flash Web site. For example, imagine integrating instructional videos into your site on bicycle repair. Until recently, adding QuickTime video to a Flash movie required that you export the entire project as a QuickTime file—and thus lose many of Flash's powerful interactive capabilities. That's no longer the case: Flash MX (800/457-1774, www.macromedia.com) lets you import a QuickTime movie—as well as a variety of other video formats such as MPEG, AVI, and DV—and play it within Flash.

Choosing an Import Method When you import QuickTime video, Flash MX lets you choose to either link or embed it in your Flash movie. Linking is the old

way of incorporating QuickTime, and it's the best method if you need to share the file with developers still using Flash 4 or 5. If you choose to link your QuickTime movie, you *must* export your final Flash project as a QuickTime file. This means that your Flash content will play within QuickTime Player and have limited interactivity.

It's more than likely, however, that you'll want to export your final Flash project as a SWF file, fully integrating the Flash and QuickTime content. In this case, embedding your QuickTime video is the way to go. But keep in mind that visitors to your Web site will need Macromedia's Flash Player 6 plug-in to view the embedded QuickTime movie.

Putting QuickTime to Use To embed a new QuickTime movie in your Flash MX file, simply drag the movie onto Flash's Stage and choose Embed Video from the Import Video dialog box. The Import Video Settings dialog box appears with options for setting video quality. (Flash MX uses the Sorenson Spark codec to compress and display video.) Here you can find the right balance between image quality and file size by choosing settings for the compression level, keyframe interval, scale, and frame mapping.

After you specify your import settings, click on OK. Flash then asks for permission to add enough frames to your timeline to accommodate the length of the imported video. Click on Yes. Flash embeds the movie in the layer currently selected in the timeline.

You can use the embedded video as you use any other imported asset. You can convert it to a graphic symbol, for example, and apply a motion tween to make it fade in and out. Or you can convert it to a movie clip symbol and use ActionScript to create interactive buttons that control movie playback.

Faking Video Effects in Flash

There are times, however, when directly embedding QuickTime video into your Flash file is impractical or even impossible. Maybe you're using an older version of Flash, for example, or you don't want to risk turning away viewers who haven't updated to the latest version of Flash Player. Or you may simply be looking for an artistic effect that straight video can't provide. In these cases, you can use a series of bitmaps to simulate video and add live-action effects to your movie.

If you create bitmap sequences of your QuickTime video, you can use Flash's drawing and editing tools to transform the bitmaps into vectors; in the process, you can reduce the number of colors and shapes, stylizing the imagery. You can isolate key figures, delete unwanted backgrounds, or silhouette the action to enhance drama. And if you use a short snippet of action this way, you can integrate it into



ILLUSTRATION BY ANDERS WENNGREN

your Flash graphics without being restricted to the rectangular boundaries of a video.

Creating Your Bitmaps To turn a QuickTime video into sequential bitmaps, first open a new document in Flash and import your QuickTime file. If you're working in Flash MX, embed the video and choose the highest-quality import settings. If you're working in Flash 4 or 5, all you need to do is add enough frames to the timeline to accommodate your video's length.

After importing your video, make sure Flash's Stage is the same size as the video. Then choose **Export Movie** from the **File** menu. In the **Export Movie** dialog box, select **PICT Sequence** from the **Format** pull-down menu, and click on **Save**. This opens the **Export PICT** dialog box. Click on the **Match Screen** button to make sure the dimensions and resolution of the PICT images match your movie's dimensions. The **Color Depth** setting determines how many colors Flash will use to translate the video. Select the **Smooth Bitmap** option to antialias the jagged edges of your bitmaps. When you click on **OK**, Flash exports a sequence of PICT images with sequential numbers appended to their file names.

Now you've transformed your video into a series of bitmaps you can incorporate into your Flash project to create the illusion of video. To insert these bitmaps, open a Flash document and import the first PICT image in the sequence. Flash recognizes it as a part of a series and gives you the option of importing the series all at once. When you click on **Yes**, Flash places each PICT image on the Stage in a new keyframe, creating a frame-by-frame bitmapped animation of the original video.

Using Your Bitmap Sequence You can leave the animation as it now appears, or you can create interesting effects by transforming each bitmap into vectors and then editing the image. For example, you can better integrate a central character into your Flash movie by changing the colors of shapes, adding new shapes, or deleting unwanted foreground and background elements (see "Tracing Bitmaps").

To convert your bitmap images into editable vector shapes, select the first PICT image and choose **Trace Bitmap** from the **Modify** menu. The resulting dialog box lets you control the accuracy of the trace. The **Color Threshold** setting determines the number of colors Flash will use, while the **Minimum Area** setting determines how loose the trace will be. For both parameters, the higher you set the number, the less faithful your tracing will be to the original image. Be careful not to create a trace that has too many shapes and colors—it may look great, but it'll balloon the file size and bog down playback. (Just because you've converted a bitmap to a vector doesn't mean it's smaller.)

Continue applying **Trace Bitmap** to each PICT image. After converting the entire sequence to vector shapes, you can edit the images by deleting background elements, changing colors, or refining contours—leaving only elements you want to emphasize.



Tracing Bitmaps Using the **Trace Bitmap** command, you can convert a single frame from a PICT sequence (left) to vectors (right). Here, the deletion of the background and foreground snow leaves a clean figure ready for integration with other Flash graphics.

Rotoscoping

Another way to give a Flash movie the illusion of video, no matter which Flash version you're using, is with *rotoscoping*. In predigital days, traditional animators relied on rotoscoping to understand an actor's movements and refine or copy them in a drawing. The Rotoscope machine projected live-action film onto an animation board, where an animator could trace an actor's outline, frame by frame, to capture natural, fluid motion.

By bringing QuickTime video into Flash, you can do rotoscoping yourself. Creating a drawing for each frame of video can be a laborious process; the length of your project will depend to some extent on your patience.

The first step in rotoscoping is to import your QuickTime video into Flash as previously described. Once it's in place, lock the layer containing the video to prevent it from accidentally moving on the Stage. Create a new layer on top of the video and trace the elements you want from the video's first frame. When you're done, choose **Blank Keyframe** from the **Insert** menu. In the blank keyframe, trace the video's second frame. Continue adding blank keyframes and tracing more video frames until you've completed the motion you want to copy. When you're done, delete the bottom layer containing the imported video. You'll end up with a frame-by-frame animation of your hand tracings (see "Follow That Gorilla").



Follow That Gorilla

The loose outline drawn over this imported QuickTime movie of a walking gorilla (top) gives the cartoon smooth motion (bottom).

Managing Your Movie

Whether you import video for direct playback or use a sequence of bitmaps, keep the amount of video to a minimum. The beauty of Flash lies in its slim file sizes and quick downloads, so don't counteract that by adding too much video. Often just a few well-placed moments of video or frame-by-frame sequences are enough to heighten the drama of your Flash movie and make all the difference. □

RUSSELL CHUN teaches Flash at San Francisco's Center for Electronic Art; he is the author of *Flash MX Advanced: Visual QuickPro Guide* (Peachpit Press, 2002).

Crowd Control

Last month's column, about user accounts and file permissions, may have left you with some larger questions. For example, how can you allow only a select group of people to read or edit a document? And how do you move a user folder to a different volume or partition? This month, you'll extend your mastery to groups, group permissions, and user-folder locations.

How to Be Part of the Group

Each file in OS X has privileges for the owner, the group, and everyone (think of this as "everyone else"). These privileges determine which users can open (read) and edit (write) each document, and launch each application, on your hard drive. While privileges for a file's owner and everyone else are fairly easy to understand, the concept of group permissions may be less clear.

What Are Groups? Groups are defined sets of user accounts. Using group permissions, you can provide a selected subset of users with access to files or folders (and applications), without granting access to everyone. Users in a group share the group's privileges; users who aren't in the group will have only the privileges given to everyone (which may be no privileges at all). For example, if you want to prevent your kids from reading a document or using a particular application on your family computer, you can create a group called Parents and set the permissions for that document or application appropriately: owner, read and write; Parents, read and write; everyone, none. (Note that these permissions will apply only to files

in public folders; anything inside your personal user folder will be as inaccessible to others as before.) Or perhaps you have a spreadsheet that you want only the finance office to be able to view and edit. You could create a Finance group, place the file in a public location on the hard drive, and give only the Finance group read and write access. In fact, using groups and group permissions is the only way to restrict file access to a subset of users. (Each user can belong to

any number of groups.) The tricky part to using groups is setting them up—though OS X supports groups and group permissions, it doesn't provide an easy way to manage them.

Set Up Groups To create a group in OS X, you use the NetInfo Manager utility (in Applications: Utilities). A warning: NetInfo is an extremely useful but very powerful utility, so if you do something wrong, you could really screw up your computer. Since the NetInfo database manages many network- and user-related settings, changing or deleting the wrong setting could affect network functions or even prevent you from logging in correctly. I strongly recommend that you back up your NetInfo settings before making any changes. Luckily, NetInfo can do this for you. Select Save Backup from the Domain menu to save a backup wherever you please. If you do anything that causes problems, you can use the Restore From Backup command in the Domain menu to retrieve your original settings.

After you launch NetInfo Manager, you must unlock administrative access. Click on the padlock icon at the bottom of the NetInfo window, and enter your account password. Assuming that your user account has administrator rights, this will unlock NetInfo and allow you to make changes.

In the Directory Browser section of NetInfo, click on Groups in the middle pane. While you can create a group from scratch, copying and editing another group is much easier. Select Guest and then click on the Duplicate Selected Directory button (the large button with two folders). This will give you a new group subdirectory called Guest Copy. Select this new subdirectory to edit it (see "Group Think").

In the Directory pane at the bottom of the window, double-click on the Guest Copy value and change it to the name of your new group (for this example, you can use Parents). Do the same with the value for the *gid* (group id) property, a unique number that NetInfo uses to track the group. You can pick almost any number you like, as long as it isn't



ILLUSTRATION BY CHRISTOPH NIEMANN

Finally, you'll want to add users to the group you've created. Click on the Users property in the Directory pane; then choose Insert Value from the Directory menu. Type in each user's short username (the name of the user's user folder). Keep adding values with the Insert Value command until you've added everyone you want as a member of that group. Now you have your own custom groups that you can use to assign group privileges. If you need to create another group, you can follow the same procedure.

Now that you've defined one or more groups, you can assign a group and group permissions to each file. Unfortunately, although OS X lets you assign group permissions via each file's Show Info window, the OS doesn't provide an easy way to choose *which* group gets those permissions. You can use Terminal to do both, but an easier method is to use a utility such as Rainer Brockerhoff's excellent \$10 shareware XRay (www.brockerhoff.net/xray), which is like a pumped-up Show Info window. Drag a file onto the XRay icon, or use the Open command (in XRay's File menu) and then select Permissions from the Show pull-down menu. From this window, you can choose which group should have privileges for a file and what those privileges should be.

Location, Location, Location

You may occasionally prefer that your user folder be located elsewhere (or if you're an administrator, that all user folders be located elsewhere). Perhaps your boot volume is running out of space, or maybe you want to keep user files on a separate volume to allow for easier backups. In OS 9 and earlier, such a move is as easy as dragging a folder to another volume. In OS X, that technique is unreliable. OS X's Finder doesn't always copy everything perfectly (invisible files, for example), and you may run into permissions problems—such as a user folder containing files that can't be opened—after making a copy. And since OS X assumes that all user folders are in the Users directory, you have to let it know if you've moved them.

The screenshot shows a window titled "local @ localhost - /". It contains two main sections: "Directory Browser" and "Directory Parents".

Directory Browser: This section displays a tree view of the directory structure. The left pane shows a list of directories: `aliases`, `aliases.aliases`, `config`, `groups`, `localconfig`, `locations`, `machines`, `mounts`, `networks`, and `networks`. The right pane shows a list of users: `guest`, `krent`, `mail`, `network`, `nobody`, `nogroup`, `operator`, `Parents`, `staff`, and `sys`. A blue bar is visible at the bottom of the right pane.

Directory Parents: This section displays a table with two columns: "Property" and "Value(s)".

Property	Value(s)
passwd	?
name	Parents
gid	501
Users	mom
	dady
	root

At the bottom of the window, there is a lock icon and the text: "Click the lock to prevent further changes."

For an example of these commands in action, see www.macworld.com/2002/06/secrets/osxsecrets.html. You can't apply these instructions if you want to move your personal user folder to a removable volume (so that you can use the same user directory on different computers, for example). The specifics are complicated, but suffice it to say that you can't log in to your account if the removable volume isn't mounted; if you try, OS X will prevent you from accessing your user directory on that volume until you or an administrator uses Terminal to fix a bunch of invisible files. Apple has acknowledged the shortcoming; hopefully, it will add support for this functionality in the future.

Power Users (and Groups)

DAN FRAKES is a Mac author and consultant based in foggy California. He's still searching for tabbed and pop-up windows in Mac OS X.

The NetInfo Manager utility lets you create and modify groups.

Tools of the Trade

In this era of tightened belts and diminished economic expectations, there are still inexpensive ways to enhance your Mac. This month, I offer thrifty solutions to nagging problems such as incorrectly named files, uninteresting e-mail alerts, hobbled browsers, excessively frisky Macs, and a recalcitrant Trash. You'll also find free ways to get rid of pop-up windows and access Microsoft Word fonts, and you'll get advice about when to upgrade a Mac.



Name Change

How can I go through the hundreds of thousands of files on our server and make the file names OS X friendly—adding file extensions and removing forward slashes and other illegal characters, for example?

Brad Bell, London, England

Use a copy of Frank Reiff's \$15 shareware application A Better Finder Rename (www.publicspace.net/ABetterFinderRename). This

simple drag-and-drop utility lets you rename a single file or a mass of files in one fell swoop. For example, if you want to append the .aif extension to a bunch of audio files, drag them to the program's icon and select Add At The End Of The Name from the pop-up menu that appears. Then type .aif in the resulting Add field. A Better Finder Rename also lets you replace and remove characters, add numbers at the beginning and end of file names, uppercase or lowercase file names, and remove extensions.

Expressive E-mail Sounds

Is there a way to use your own mail-notification sounds in Microsoft Outlook Express 5?

Geof Franks, Christchurch, New Zealand

Enlist the help of Expression (www.soundsetcentral.com), a free RealBasic program from Erik Barzeski, to create a custom set of sounds for Outlook Express 5's Welcome, New Mail, Sent Mail, Mail Error, and No Mail actions. (You can also create custom sound sets for Entourage, which includes a sixth action called Reminder; these work in the OS X version, too.)

Expression is very easy to use. Just click on the Choose button next to the action you want to create a sound for, and select a sound saved in the SFIL format (used for alert sounds in OS 9.2 and earlier). If you'd like to use sounds saved in other formats (WAV or AIFF, for example), simply convert them with Norman Franke's free SoundApp (www.spies.com/~franke/SoundApp).

Once you've saved a sound set, you can install it in OS 9.2 and earlier by opening the Documents folder at the root level of your hard drive and navigating to the Microsoft User Data folder. Add the new sound set to the Entourage Sound Sets folder (if you're using Entourage) or the Sound Sets folder (if you'd like to add sounds to Outlook Express).

The procedure is the same for Entourage running in OS X, with the exception that you'll find the Microsoft User Data folder inside the Documents folder in your users folder (Macintosh HD: Users: *user name*: Documents: Microsoft User Data: Entourage Sound Sets).

Export Restrictions

In the past, I used Netscape Communicator's Export command to make a backup copy of my Address Book, in case something went wrong with my computer. I can't find a way to do this in Netscape 6.2.

Ing Francisco Aguirre, Guatemala City, Guatemala

'Tis too true, I'm afraid, that Netscape 6.2 lacks a command for exporting your Address Book. Thankfully, you can easily work around this inexplicable shortcoming by copying the Address Book file, called *abook.mab*, from your Mac's hard drive to the backup media of your choice. In Mac OS 9.2 and earlier, follow the path Macintosh HD: Documents: Mozilla: Profiles: *user name*: *oddly named folder*: *abook.mab*—where *user name* is the name of your profile (mine would be Christopher Breen, for example), and *oddly named folder* has a name consisting of a seemingly

random bunch of characters followed by the *.slr* extension. In OS X, follow the path *your user folder*: Library: Mozilla: Profiles: *user name*: *oddly named folder*: *abook.mab*.

If you really, really want to export your Address Book, there is a way. Download a copy of Mozilla (www.mozilla.org), Netscape's open-source variant. Mozilla uses the files stored in the Mozilla folder that's created when you install Netscape 6. Mozilla includes an Export command that appears in the File menu when the Address Book is open.

Slower Scroller

I love my new Power Mac G4, but I also love my old word processor, WordPerfect 3.5. With such a fast Mac, my WordPerfect documents scroll far too quickly. Is there any way to slow down scrolling speed?

Fritz Dumville, Providence, Rhode Island

Absolutely. Just download a copy of Marc Moini's \$12 shareware utility Smart Scroll (www.marcmoini.com/SmartScroll.html), which lets you set six levels of scrolling speed. It also lets you configure windows so that one scroll arrow is at each end of the scroll bar, both arrows are on the bottom, or both arrows are at each end. Smart Scroll can also provide a proportional scroll box, which indicates how much of a document is visible on screen (as the Smart Scrolling feature in the Appearance control panel can).

Smart Scroll is not OS X native, but the speed-governor feature works in the Classic environment.

Underprivileged Trash

When we select Empty Trash from the Finder menu in OS X, the Trash remains full and we receive an error about not having enough privileges to empty the Trash. What can we do?

Manuela and Christina Cross,
Modesto, California

Check out BatChmod, Renaud Boisjoly's free privilege-changing utility (<http://homepage.mac.com/arzysoft>). BatChmod lets you fiddle with file and folder privileges—the kind that can keep you from deleting a file—via an easy-to-use graphical environment rather than via OS X's easy-to-use-only-if-you're-a-Unix-wonk Terminal. The utility also lets you change the Read, Write, and Execute privileges for Owner, Group, and Everyone, and it lets you choose a different Owner and Group (for example, you can



change the Owner to root or nobody and the Group to wheel or admin).

Thankfully, you needn't muck with these privileges to empty the Trash. Just select Force Empty Trash from the BatChmod menu, and the program will attempt to set the proper privileges and, if necessary, unlock the locked files in your Trash and any other local Trashes (you may recall that each user in OS X has an individual Trash). Finally, it will empty the Trash (see "Trash Talking").

Stop the Pop-Up

How do I stop pop-up windows from appearing in my browser? My poor little dial-up connection and I have had it with offers from casinos, companies that make spy cams, and Web sites unsuitable for discussion in Macworld.

Jon R. Conti, Santa Monica, California

A pop-up is a window that suddenly appears on a Web page when you enter or exit it. They usually contain advertising, although I've seen some that carry a survey or an important message about the site.

Given that a number of sites overuse these ads to the point where you immediately slam ⌘-W before the windows fully draw (and you swear to never revisit the site), I understand your desire to make them pop off. Your browser offers the means for doing so.

Pop-up windows are triggered by JavaScripts that open a new window without your say-so. To get rid of pop-up windows, you must disable JavaScript's ability to open them.

One way to do that is to simply disable JavaScript completely. Most Web browsers include this option, but activating it also limits your ability to use helpful JavaScripts. For example, World Without Borders (www.wwbchat.com),



Many folks have expressed disappointment that OS X is missing OS 9's customizable function keys. This is very inconvenient in programs that make extensive use of the function keys. However, there is a way around it.

Boot your machine in OS 9.X (by selecting it from the Startup Disk preference pane) and open the Keyboard control panel. Click on the Function Keys button and turn on the Enable Hot Function Keys option.

Deselect the Use F1 Through F12 As Hot Function Keys option. Run the Startup Disk control panel, select your OS X volume, and restart.

Pressing the F1 to F6 keys in OS X will no longer trigger the default commands. If you have a PowerBook or iBook with an fn key, you can invoke the brightness, volume, number-lock, and mute functions by holding down the fn key and pressing the corresponding function key.

Dylan Drazin, Brooklyn, New York

UNSOLICITED ADVICE

Since we're focusing on all that's bright and beautiful in the world of inexpensive tools, allow me to list a few of my favorite OS X enhancers.

Web Searching Dan Wood's Watson (\$29; www.karelia.com/watson) is a scrumptious OS X-only Web-searching utility that lets you scour eBay auctions; check exchange rates, stock quotes, and flight times; locate images on the Web; search your local movie and TV listings (as well as view QuickTime previews for some movies); track packages; and hunt down recipes. As Wood and associates develop more plug-ins, it will do even more. Apple should throw buckets of money at Wood and incorporate Watson into a future version of Sherlock. (For more information on Watson, see *Reviews*, April 2002.)

Universal USB Driver OS X-compatible USB-device drivers are still in short supply. If your favorite USB mouse or trackball won't work in OS X, give Alessandro Montalcini's \$20 USB Overdrive X (www.usboverdrive.com) a try. USB Overdrive is also available in a version for OS 9.2 and earlier.

Scanner Driver Speaking of missing drivers, OS X woefully undersupports scanners (particularly the SCSI variety). Hamrick Software (www.hamrick.com) comes to the rescue with VueScan, a \$40 utility that may enable your scanner to work with OS X. VueScan doesn't support all scanners (owners of Umax USB models are out of luck, for example), but if yours is on the list, this may be your only option for getting it to work with OS X.

✧ a chat service where I routinely appear as a guest, won't function if you turn off JavaScript.

Thankfully, some browsers allow you to limit what JavaScript can do. For example, both Mozilla and The Omni Group's OmniWeb (www.omnigroup.com) include an option that, when disabled, prevents JavaScript from opening windows you haven't specifically requested. You'll find this option in Mozilla's Scripts & Windows preference and in OmniWeb's JavaScript preference. The iCab browser (www.icab.de) lets you filter JavaScripts (including the ones that produce these pop-up windows) via the InScript preference.

And what about the big guns, Netscape Navigator (www.netscape.com) and Microsoft Internet Explorer (www.mactopia.com)? Regrettably, the world's two most popular browsers are also among the most inflexible in regard to limiting JavaScripts: both let you choose only to turn off JavaScript altogether. To do so in Netscape, select the Advanced preference and deselect the Enable JavaScript For Navigator option. In Internet Explorer, deselect the Enable Scripting option in the Web Content portion of the Preferences window. Opera (www.opera.com) also limits you to turning off all JavaScripts. You do this within the Multimedia section of Opera's Preferences window.

Oh, and America Online is the least obliging of all. The only way to bar JavaScripts in AOL is to completely disable Java. Select Preferences from the My AOL menu, click on the WWW preference and then on the Advanced Settings button in that window, and deselect the Enable Java option.

Functional Font Field

I occasionally need to change fonts in a Word 2001 document. Because I have a lot of fonts, it's a real bother to scroll slowly through the font list in the Formatting palette or Font menu to find the font I need. Please tell me there's an easier way.

Ian Pimm, Portland, Oregon

There's an easier way. Click in the Name field in the Font section of Word's Formatting palette (View: Formatting Palette) and type the first few letters of the font you want to use—**pal**, for example, if you want to choose Palatino. Press the return key, and the font should be ready to do your bidding.

While we're on the topic of typing into fields in Word's Formatting palette, here's another trick: Select some text and alter the formatting in some way—create an indent, choose a new font, change the text's color, and make everything bold, for example. Now click in the Style field within the Font portion of the Formatting palette, and type a name. You've just created a new style that you can recall by selecting its name from the Style drop-down menu.

Upgrade Options

I have one of the original PCI Graphics Power Mac G4s, with a 400MHz processor and a 10GB hard disk. Is it possible to upgrade to a faster processor and a larger hard drive? Or should I discard it and buy a newer model?

C. B. Kennell, Oakland, California

From one C. B. to another, here's the straight dope: Although Apple is flinging G4 processors with megahertz ratings double that of your Power Mac's into the consumer-oriented iMac line, you won't find these high-octane specs in upgrade processors such as those from PowerLogix (512/795-2978, www.powerlogix.com), Sonnet Technologies (949/587-3500, www.sonnettech.com), and XLR8 (770/564-5682, www.xlr8.com). As we go to press, G4 ZIF upgrades (the kind you'd use in a Power Mac) top out at 500MHz.

Frankly, the modest performance gain you'd realize isn't worth the \$400 you'd have to pay for one of these upgrades. I'd wait for faster upgrades or until the lure of that cool new iMac becomes too much to resist.

Upgrading the hard drive, on the other hand, is a wonderful idea—and easy to do. You can either keep the hard drive you have and add another IDE drive—configuring it as a slave and plugging it into the free IDE cable—or replace your original hard drive with a much more expansive IDE one. You'll find instructions for upgrading the hard drive in your Mac's manual. □

Contributing Editor CHRISTOPHER BREEN is the author of the handy troubleshooting guide *Mac 911* (Peachpit Press, 2002).



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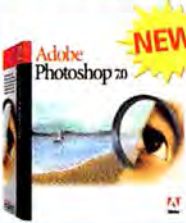
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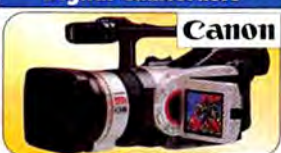
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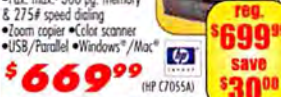
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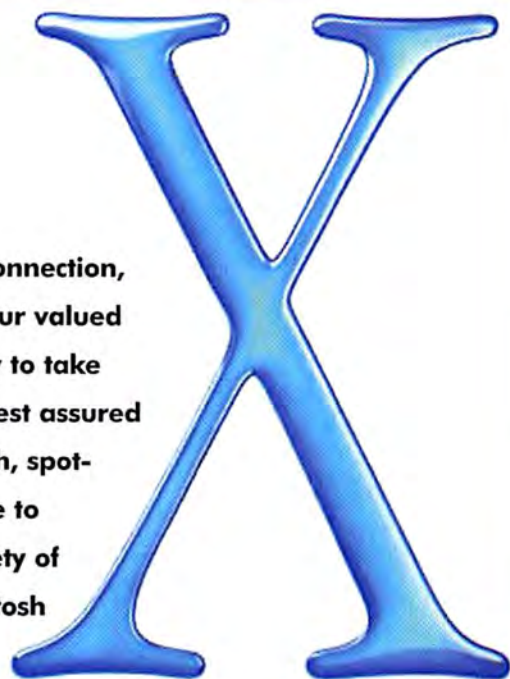
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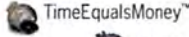
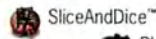
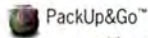


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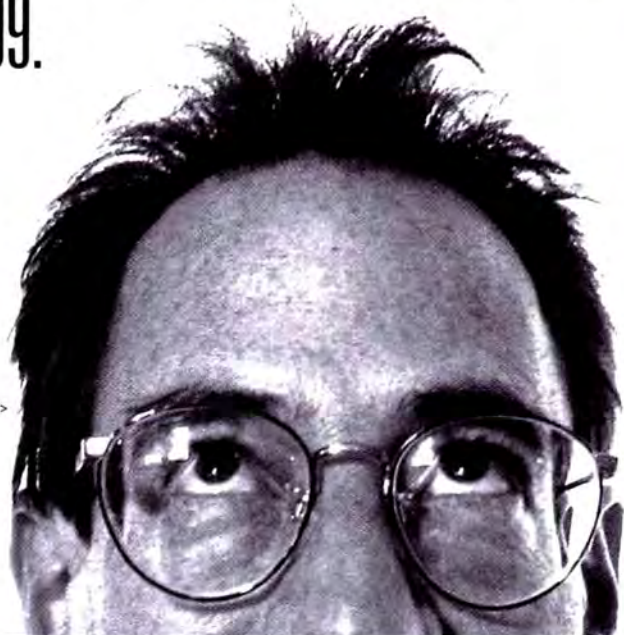
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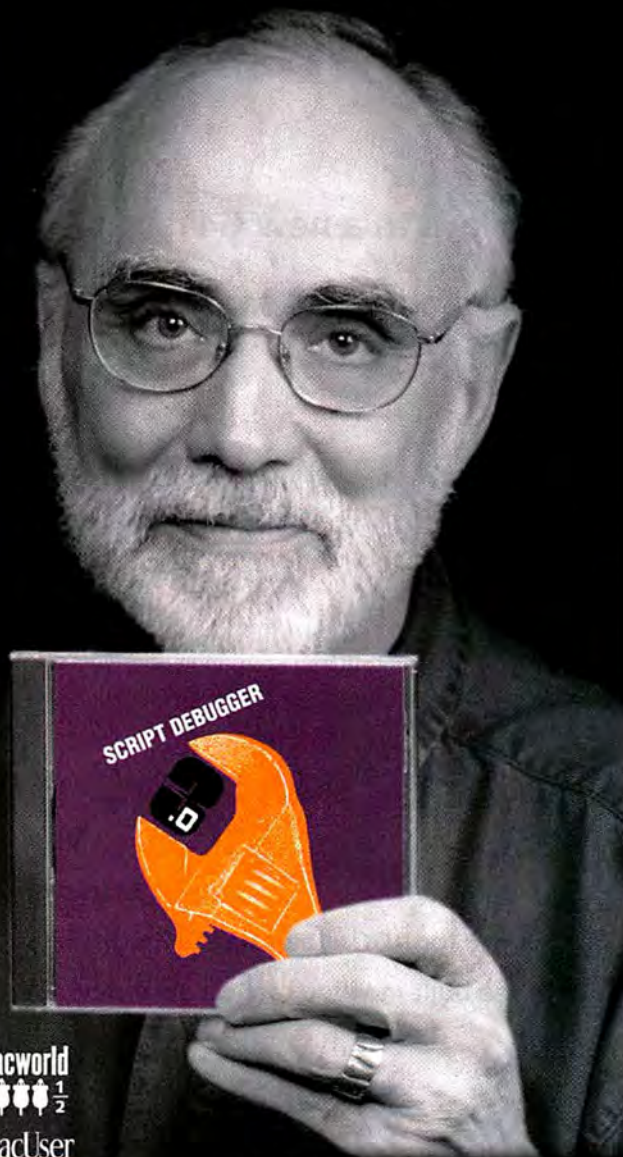
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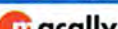
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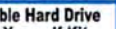
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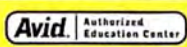
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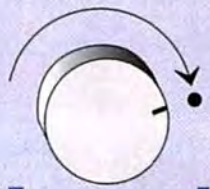


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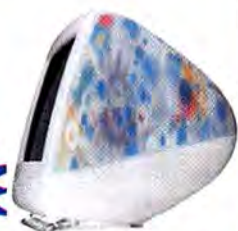
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ANDY IHNATKO

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alternative programming languages started popping up. Now you can program the RCX using syntax that resembles C, Java, Forth, Smalltalk, and plenty more. People are even creating entire new RCX operating systems that replace the little brick's standard Lego firmware with something more geek friendly. One guy has written a TCP/IP stack that lets you put the RCX on the Internet, for Cloacina's sake.

I've been programming my projects with Dave Baum's NQC (a free download from www.enteract.com/~dbaum/nqc/, available in both OS X and OS 9 flavors). NQC stands for Not Quite C, a tip-off to its basic syntax. Dave is a Mac guy at the genetic level, so in addition to being one of the most popular and flexible alternative RCX-development systems around, NQC has a great Mac pedigree. All you need is a device such as Keyspan's \$39 USB PDA Adapter (www.keyspan.com), so your Mac can upload compiled NQC code through Mindstorms' PC-style serial port.

He's also written an infectious good book for the new RCX enthusiast: *Dave Baum's Definitive Guide to Lego Mindstorms* (\$30; Apress, 1999). After you've gotten up-to-speed, you'll discover the black-tar heroin of the Lego world: Mario and Giulio Ferrari's highly addictive *Building Robots with Lego Mindstorms* (\$30; Syngress, 2001). It's an entire primer on fundamental mechanical engineering. When I tell you that the first chapter describes the dimensions of a standard Lego brick and the twentieth chapter describes how to build a multiple-axis robotic chess-playing arm, you'll get the idea—this book has a street value of roughly \$47,000 a kilo.

God bless this industry. Every six months or so, something comes along to rekindle my interest in computing. For now, the RCX is it. I couldn't be happier . . . more or less.

I worry only when I look at how the RCX fits into the Big Picture. I still have an Alternative Hairstyle and spend all day horsing around with computers and video games. I still buy new comic books every Wednesday. And the closest I come to Deep Personal Interactions is the regular and violent arguments I have on the Web about whether Twiki from *Buck Rogers* could kick C-3PO's butt in a bar fight.

And now, Lord help me, I'm playing with Legos again. I mean, good heavens. Why don't I just hire a football player to come over every day at 1:15 and chuck dodgeballs at my face for 45 minutes? Then I could claim that I'd made absolutely no progress since junior high. □

This book is the black-tar heroin of the Lego world.

Contributing Editor ANDY IHNATKO (www.andyi.com) will soon finish building and training his robot army. And then all will bow down before him! Bow down, I say!

It's Easy to Create Killer Robots on Your Mac

Danger, Andy Ihnatko!



RECENTLY, I'VE BOUGHT TWO OF THE MOST DESIRABLE desktop computers as yet wrought by the hand of humanity. I've replaced Lilith IV, my three-year-old PowerBook G3, with Lilith V, a nice Titanium

PowerBook G4. And I just bought a new Power Mac G4, not because I wanted to own the fastest consumer desktop on the planet, but because I wanted to finish burning every single episode of *Babylon 5* onto DVD, and before I could finish the job, I had to send back the SuperDrive-equipped Power Mac Apple had lent me for review purposes.

Robot Power

But here's the weird bit: the new computer that's spawned the greatest interest and sucked up the majority of my free time lately hasn't been either of Apple's hyperhot G4-based models. No, it's been a machine with an 8-bit processor, 32K of RAM, a simple LCD screen, four rubbery push buttons, and a voracious appetite for AA batteries. And in our age of USB and FireWire ports, this technical marvel has three inputs for sensors and three outputs for things such as motors and lights.

It's a yellow brick about the size of two decks of casino-size playing cards and studded with the familiar nubby surface we've come to expect from Lego blocks. It's the RCX, the computer at the heart of the Lego Mindstorms Robotics Invention System (<http://mindstorms.lego.com>).

A kid needs to bring some *serious* bar-mitzvah money to his local toy store if he wants to go home with one of these boys. For \$199, you get a big box packed with regular Lego bricks, plus the RCX and a bunch of motors, gears, and sensors. But don't lump Mindstorms with those motorized Lego kits we had as kids. A motorized Lego robot built back when *Star Trek: The Next Generation* was in its first season would be no more capable of intelligent or autonomous decision-making than, say, the average *Enterprise* bridge officer.

No, the 'bots you build with Mindstorms bump up Bad Crazyness a whole order of magnitude. It's not a question of hooking a motor to a Lego axle, switching it on, and watching it roll forward in a straight line until it crashes into a wall. OK, so maybe that *is* the first thing you'll build, particularly if you've got an action figure you can strap on top before you send it rolling. But then you'll start to wonder how tough it'd be to create a machine that could safely pilot itself around your house all on its own.

Before you know it, you've wasted three days trying things out and writing software for the RCX, and you've finally got BuserBot rolling merrily through your house, using a light sensor from the kit and an LED from your keychain to scan its environment for the hundreds of little reflective Scotchlite dots (which tell BuserBot where it is relative to your office) that you pasted onto the baseboards.

It may sound like a waste of time, but it's a real labor saver. Now, whenever I want to know what the temperature is in the den, I set BuserBot down in my office and press the RCX's Run button. Ten minutes to half an hour later, it returns and emits seven long beeps and three short ones: 73 degrees. It's accurate, too: every time it comes back, I dash into the den—and by golly, that \$30 Lego temperature sensor agrees with the \$5 window thermometer almost exactly!

Look, I'm not trying to say that this makes sense. I'm saying that it's *cool*.

Lego Olympus

Mindstorms restores something missing from computers. Even when you're writing your own software, you're not in total control. You're a minor part of the pantheon—not Mars, god of war, or Diana, goddess of the hunt; instead, you're more like Cloacina, goddess of sewers.

Out of the box, a Lego Mindstorms kit is nothing. Like primordial ooze, it doesn't have any form until you conceive of something and call it into being. You know what that means? With Mindstorms, you're not just Mars or Diana . . . you're Jupiter, complete with plenty of wrath and a big quiver of lightning bolts. No wonder the geek community leapt upon Mindstorms and dragged it back to their Hobbit holes.

Traditionally, Mindstorms has not been a very friendly product for Mac users. To program the RCX, you're supposed to use a graphical software-development kit that only runs under Windows.

But the geek community has elevated Mindstorms far beyond its original function as an educational toy. See, the RCX is based on a well-known and well-documented microprocessor, so it wasn't long before

You'll need *serious* bar-mitzvah money if you want one of these boys.

< continues on page 139

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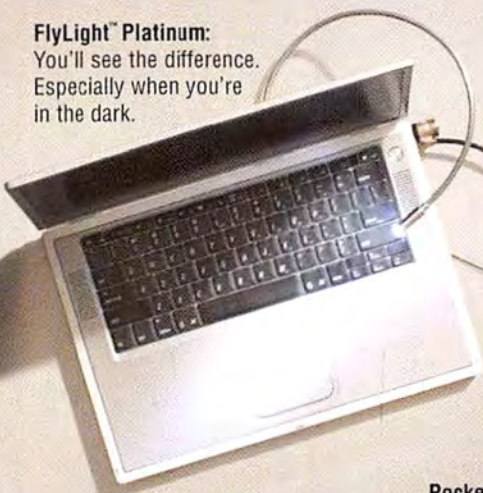
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