Macworld

THE ULTIMATE GUIDE TO DIGITAL CAMERAS

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PLUS

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Adobe PageMaker 7: Worth the Wait?
Get PCs on Your AirPort Network
Cascading Style Sheets Secrets
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Macworld's Ultimate Buyers' Guide: Digital Cameras
DEKE MCELLAND As the holidays near, many Mac users' thoughts turn to digital photography. After all, nothing beats a digital camera when you want to record a festive gathering or please a gadget-loving spouse. This complete guide demystifies the digital camera's many features, so you can choose the one-, two-, or three-megapixel camera that's right for you.

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Forums and Feedback

True Colors
Most everyone seemed to love Bruce Fraser’s in-depth look at 20 ink-jet
and laser printers—and the overall
depth of the August 2001 issue. But
what really inspired some colorful
comments from readers was Andrew
Gore’s column about our plans to use
blue mice in future ratings, which will
be based on a product’s performance in Mac OS X. That deci-
sion has many of you concerned—but rest assured, our primar-
y goal is to serve readers, be the mice blue or red. It’s when we
choose a Flower Power color scheme that you should worry.

The Ultimate August Issue
• CURTIS RUNYAN I don’t know
how you did it, but I swear that you
designed the August 2001 issue to
solve nearly every computer problem
I’ve been fighting lately. I was ready
to throw my Lexmark printer out
the window before I read your tip
about adding memory (“Macworld’s
Ultimate Buyers’ Guide: Printers”)—
thanks also for the suggestions on
finding dirt-cheap RAM and the
helpful review of printer technology.
David Blatter’s tips on preparing files
for a service bureau (Print Publishing
Secrets) were great refreshers. And the
review of CD-RW drives was excellent.

• ROLLIN J. SHOEMAKER I am a
longtime subscriber, but I’ve been
quite unhappy with recent issues. I
didn’t feel that there was much meat,
and the magazine had a writing style
that I didn’t appreciate. The August
2001 issue is much, much better. This
is the magazine that I used to get and
that it appears I will get once again.

• ANTHONY BURUKAS The latest
issue of Macworld was chock-full
of useful info, and it was the first in
a very long time that I didn’t blow
through in less than an hour. There
were still a few quickie articles and
reviews, and that’s OK—the crux of
the magazine seems to have returned
to substantial reporting. This means
the issue had value. Keep it up, and
you can expect my renewal.

We’re glad you liked the August issue,
and we hope this issue, with its “Ulti-
mate Buyers’ Guide: Digital Cam-
eras,” is just as valuable.—Ed.

Red Mouse, Blue Mouse
• HILLARD SCHNEIDER Give mouse
ratings only to OS X apps (“The Blue
Mouse Cometh,” The Vision Thing,
August 2001)? Do you have any idea
how many Macs in the 28 schools
in my New York City school district
have the 128MB of RAM required
by OS X? None. Your policy of not
supplying users of these machines
with product ratings doesn’t help
us—or, I suspect, the vast majority
of home Mac users. And don’t tell
me that memory is cheap—we’re
breaking pencils in half to keep our
students supplied.

• SEAN HARRIS We Mac users are
quick to quote the BMW analogy in
support of our argument that soft-
ware companies should cater to the
Mac’s relatively small 5 percent mar-
ket share. It strikes me as odd and
disconcerting, then, that Macworld
would choose to completely ignore
the whopping 32 percent of Mac
users who have chosen to stay with
the fully functional, noncartoonish,
pre-OS X operating systems.

• JON WINKLEMAN I was glad to
read your recent editorial about
moving over to blue mice, in part to
encourage software makers to make
the leap to OS X. Right now I’m in
a computing limbo. I want to make
the switch, and the sooner, the better.
What holds me back is the fact that
most of the software I own, espe-
cially the drivers for my peripherals,
is in OS 9. I enjoyed your recent
review of CD-RW drives (August
2001), and I need to buy one. How-
ever, I want to know which manu-
facturers have or soon will have OS
X-native software. I would also like
a new printer but have the same
problem. Please consider publishing
an article about which peripheral
makers are aggressively developing
for OS X.

• GEORGE LAKEHOMER There are
two facts that I believe you are over-
looking in your zeal to support Mac
OS X. First, Apple has always been
a leader and innovator by being the
only computer maker who manufac-
continues
tures hardware and operating systems. With OS X, it becomes just one more hardware manufacturer with no true proprietary OS. The second point concerns how quickly you have changed your tune about the stability of pre–OS X Mac operating systems. OS X is a parasite, depending on the life of another, completely different OS in order to live. The decision expressed in “The Blue Mouse Cometh” is the only wise move a magazine could make, and I applaud your doing so. But you should be cognizant of the potential wrath of misled readers who purchase a recommended product and end up feeling they’ve wasted money when it doesn’t perform as reviewed. That’s been part of the landscape for years, but now you’re really walking the high-wire without a net.

JAMES SHOOP Does dyeing the mice different colors hurt them? We must take a stand against the mistreatment of these poor mice, shamelessly dyed blue and then stuck between the pages of a magazine.

iBook Memories

JAY WEITZEL In August’s The Vision Thing, Andrew Gore says that he will “twist a few arms” to promote the move to Mac OS X. He proclaims it his mission to ensure that “the people who make Mac hardware and software . . . put maximum effort into bringing top-notch products to Mac OS X.” Yet 12 pages later, Macworld awards four mice to Apple’s low-end iBook (Reviews, August 2001), which (as your review notes) ships with only 64MB of RAM—insufficient to run OS X at all. If Apple itself cannot be bothered to ship OS X–compatible hardware, why should any other hardware or software vendor have their arms twisted to do so? I can conclude only that Apple’s arm is one Macworld does not dare twist.

SUZANNE MACKENROTH Please tell Andrew Gore that I have a new iBook (Reviews, August 2001), and Apple doesn’t need to send a screw-driver with this computer [so you can access the AirPort and RAM slots]. All it takes is a quarter.

Stop the presses!

ELAINE NASH I really loved the Print Publishing Secrets column (August 2001). The items David Blatner mentioned can’t be stressed enough. I’ve worked with Macs in the printing industry since 1984. Now that every Tom, Dick, and Lucy has access to a computer, they automatically think they’re graphic designers. People seem to have a hard time understanding that just because it looks good on screen doesn’t mean you can output it to a printing press and duplicate it.

However, you missed a rather important item. Please, for the love of God, don’t use Microsoft Word to design your newsletter, brochure, book, letterhead, or whatever. It is not meant to create items destined for a commercial printer. You should use it only for something you intend to print yourself on your own printer. If you are designing a product for printing at a commercial printer, please use a professional desktop-publishing package such as Adobe PageMaker or InDesign or QuarkXPress. You’ll save everyone a fortune in Extra Strength Tylenol, and your service bureau will love you for it!

Get Lost, Macworld

LEE FREEDMAN While the GPS-comparison article made for interesting reading (“Off the Map,” Buzz, August 2001), I think the results of your test may have been a bit skewed in favor of the participant who had a map. Since the article did not specify where the people using the products were from, I would assume they were residents of San Francisco or the Bay Area. I’m sure it would be much easier to navigate over familiar streets using a map than to follow a GPS routing to a latitude and longitude position.

Philip Michaels, who held the map, was the only tester not from San Francisco. However, we think the results had more to do with testing in an urban area than with his knowledge of the city streets.—Ed.

Off the Charts

JIM MOSKOWITZ The “Monochromes Measure Up” benchmark (Macworld’s Ultimate Buyers’ Guide: Printers,” August 2001) is misleading. A reader looking at the first two entries in the first column, which measured text-document printing speeds, would think that the Brother HL-1270N took twice as long as the Brother HL-1670N to print a text document, because the colored bar representing the amount of time is twice as long. The actual times? 67 seconds for the first printer and 54 seconds for the other. The scores are actually very close, and the graphic should show that.

We did indeed goof on the lengths of comparison bars in that benchmark's Text Document column. The listed times are correct.—Ed.

Post your comments on our forums (www.macworld.com) or send them by mail to Letters, Macworld, 301 Howard St., 16th Fl., San Francisco, CA 94105; via fax to 415/442-0766; 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

Energy consumption for the 733MHz PowerPC chip should be expressed in watt-hours, and a PowerPC 7450 powers the 733MHz Power Mac (“Power Macs,” Buzz, August 2001). The Epson Stylus Photo 780 is not OS X ready, and the estimated ink cost per page for all photo-quality printers except the Canon S800 was based on 5 percent ink coverage for black ink and 15 percent ink coverage for color ink (“Macworld’s Ultimate Buyers’ Guide: Printers,” August 2001). The author of the 15-inch flat-panel monitor roundup (Reviews, September 2001) was misidentified in the magazine’s table of contents. Tony A. Bojorquez and James Galbraith wrote the piece. John Francis created the image that appeared in “Inspiration Starts Here” (The Vision Thing, September 2001).
room to burn

Need more space? Try a digital solution. Back up your data, even burn all your video, MP3s and multimedia presentation files onto CD. Anyone can do it with Toast® 5, by Roxio. The best selling CD burning software in the world for the Mac. Use a PC? Look for Easy CD Creator® 5.
WHEN MAC OS X DEBUTED IN MARCH, it gave Mac users a first glimpse of their platform’s future—but at the time, not many applications ran natively in the new OS. That’s about to change as OS X moves rapidly out of the realm of early adopters and into the daily lives of Mac users. A major update—Mac OS X 10.1—promises to provide greater stability and more functionality.

And some familiar products will soon make their OS X debut. These are the killer applications—the essential programs that, along with the promised improvements in OS X 10.1, remove some of the final barriers keeping Mac users from switching to the new OS.

According to Apple, the release of OS X 10.1 marks the halfway point in the transition from OS 9 to OS X. How well the latest applications take advantage of the new OS will determine how smoothly the rest of the journey goes.

ADOBE’S MAC OS X DESIGNS
Adobe (800/833-6687, www.adobe.com) hopes to give graphics pros a reason to take a second look at Mac OS X, with new versions of InDesign and Illustrator that, in addition to introducing the spate of enhancements that are part of any update, run natively in OS X.

Adobe says it will release InDesign 2.0 this winter, meaning the application may not ship until early 2002. At press time, Adobe hadn’t announced pricing. But with 800 new features, InDesign’s upcoming release reaffirms a commitment to OS X by one of the Mac’s most important developers.

Adobe has already hinted at many of the features we’ll see in version 2.0 (see “Product Watch,” Buzz, August 2001). Users will be able to easily make text, pictures, and boxes transparent. They’ll also have sophisticated built-in table-making tools. And InDesign 2.0 will let users import and export document content in Extensible Markup Language (XML). The Show Structure feature will split the main window to give an outline view of XML tags identified by name. Adobe is billing the structural-view function as a beta—possibly an acknowledgement that the tool needs some work before it will be fully functional.

Adobe has also worked to enhance InDesign’s performance. Mundane but critical tasks such as placing text and graphics should be speedier in the new version.

Beating InDesign 2.0 to market, Illustrator 10 is set to ship before the end of the year, priced at $399 ($199 for an upgrade). The update intro-
RETROSPECT BACKUP MOVES AHEAD

Mac users who rely on Retrospect Backup, from Dantz Development (800/225-4880, www.dantz.com) to safeguard their data have been anxiously awaiting a Mac OS X–native version of the backup software. Though a Retrospect Client beta has been available for Mac OS X since the spring, Retrospect 5.0, to be released this fall, will allow users to schedule and run backups directly from Macs running OS X.

Retrospect Express Backup will cost $49 for new users; Retrospect Desktop Backup, $149 for new users; Retrospect Workgroup Backup, $299 for new users; and Retrospect Server Backup, $499 for new users. (Dantz has not yet set upgrade pricing for the four products.) Starting with version 5.0, Express and Desktop won’t back up computers running AppleShare IP or Mac OS X Server. Instead, Workgroup will let users back up a single, local server; the new Server Backup is Dantz’s multiserver product.

It’s taken Dantz this long to bring Retrospect to OS X because the program must write to various external hardware devices, such as CD-R, tape, and removable drives. Mac OS X doesn’t offer the robust support for these devices that Mac OS 9 did. In addition, Mac OS X’s file system is much more complicated, making it much harder to restore files from a backup when the need arises. “OS X has an incredible amount of file system minutia that we need to recognize at the time backups occur and honor at restore time,” says Eric Ullman, Dantz Development technical marketing manager.—JASON SNELL
Hawkish on the Mac

Q&A with TONY HAWK

Tony Hawk's list of achievements is impressive: he's the inventor of more than 50 skateboarding tricks, the only skateboarder to pull off "the 900" (a two-and-a-half-turn maneuver) in competition, and the standard by which people measure performance in his sport—even after his retirement from active competition. And then there are his business interests, which include clothing, skateboards, film, and video games. Is there anything we haven't covered? "Just that I'm a true Mac devotee," he says. Chances are, when Hawk isn't on his skateboard, he's in front of his Power Mac or PowerBook, doing everything from burning CDs to editing digital video.—ANDREW SHALAT

Q: You're mainly doing video on your Mac. Is that for 900 Films, your video-production company?  

Q: How many Bones Brigade [Hawk's skateboarding team] films were there?  
A: There were, like, six when I was on the team.

Q: And that's what got you started?  
A: That's what got me interested in video—just watching the editing. It wasn't quite the time of Media 100 yet, so we did the editing on a Mac. But it wasn't nonlinear. It all went to tape.

Q: So it was hooked to a ¼-inch editing bay?  
A: Yeah. I watched, and I was into Amiga, and I heard about the Video Toaster coming out, and I ended up getting one of those. I learned the basics of nonlinear editing, and then I eventually bought a Media 100.

Q: And in the mid-1980s to the late 1980s, a Media 100 system was very expensive.  
A: Yeah. It took a lot out. And in those days, I wasn't making any money, so I took a big risk.

Q: Do you do films or video?  
A: Both. Right now we're just shooting action stuff—16mm, 35mm of skateboarding, snowboarding, action sports like that.

Q: As far as your skating is concerned, do you have any unfulfilled ambitions?  
A: Not really. I'm enjoying my time now. I'm focusing on the projects I'm doing and trying to be better, like with the video game and with clothing and shoes. And as soon as I heard that Activision was doing the PC version [of Tony Hawk's Pro Skater], I began pushing for Mac. I met with Apple when I went to the keynote speech [at last January's Macworld Conference & Expo]. They helped push my Titanium PowerBook order through, because I literally ordered my Titanium the night of Expo. I use it daily. If you ask my wife, she'll say I use it too much.

Q: If you were no longer allowed to skateboard, what do you think you would do?  
A: I'd spend more time on my Mac. I'd probably be more heavily involved with my companies—with developing Web sites, that sort of thing.

AT A GLANCE

TONY HAWK
AGE: 33  
RESIDENCE: Carlsbad, California  

FAVORITE SOFTWARE: Adobe Photoshop, Netscape Communicator, Apple Final Cut Pro

PERIPHERALS: Hewlett-Packard DeskJet 950c, Umax PowerLook 1100 scanner

P R O  F I L E

Gorillaz in the Midst

The music world survived the Monkees—so why not the Gorillaz? This four-piece hip-hop band—made up of Murdoc, 2-D, Noodle, and Russel—is nothing but a collection of Flash-based characters, yet they're still more animated than Peter Tork. The band-cum-Flash animation is the creation of Damon Albarn, singer for Blur, and Jamie Hewlett, creator of the underground comic Tank Girl. Their online home, www.gorillaz.com, really peels off our banana. The site allows visitors to wander the halls of the band's Kong Studio, courtesy of a Shockwave Flash plug-in. With nearly as many rooms as Graceland, the studio has all sorts of Flash-based gadgets to monkey around with. Users can create their own musical tracks on Russel's mixer, spy-play the bathroom walls with graffiti, and even play around on Noodle's Mac. And that's just the beginning of the interactive hijinks at a Web site that's more fun than a barrel of monkeys.—MATHEW HONAN


Tony Hawk talks about Mac OS X and his video game, Tony Hawk's Pro Skater 2, which runs on the new OS.
Sharp, colorful pictures. Minute detail. Subtle degrees of shadow. True, natural color. These are the things that drive us to create the very best digital cameras. Our latest is the CAMEDIA C-4040 Zoom. An f1.8 zoom lens. 4.1 megapixels. Noise reduction. Auto-Connect USB ease. Creative control. It will help you see things in new ways. Transform the ordinary into art. And capture the most realistic digital images yet. Nothing’s impossible.

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Mac Beat

Students Gain Reel Experience

Marco Torres, a teacher of social studies and media at California’s San Fernando High School, had a vision: a room full of Power Mac G4s, iMacs, and iBooks—machines that would turn students into media marvels. The resulting Community Inspiration Studio has made the school a hotbed of digital-filmmaking creativity.

“We focus on project-based learning,” Torres says. Take a recent assignment: to make a video about immigration—a subject that hits close to home at a school where a majority of the students can trace their family roots to Mexico. Students wrote an outline and drew storyboards. “They know every part of their story before they ever take a piece of equipment out of this room,” Torres adds.

After collecting their footage with DV camcorders, students imported it to iMac DVs and used iMovie to capture and edit clips. The student videographers compressed their videos with Media 100’s Media Cleaner and saved them to QuickTime.

But Alsoft didn’t lose one bit of critical data—records, sales information, or other files. The company, which makes DiskWarrior and other utilities, had used Dantz Development’s Retrospect Backup (800/225-4880, www.dantz.com) to back up all of its data on DAT drives. Alsoft’s comprehensive strategy for backing up data kept a catastrophe from turning into a complete loss.

“Far too many individuals and small businesses don’t think about implementing a backup strategy and disaster-recovery plan until it’s already too late,” said Dantz Development technical marketing manager Eric Ullman.

Alsoft backs up its servers onto 4GB DAT drives; each day, a different company administrator is responsible for the process. Each of the company’s 14 employees has a DAT tape drive with which to back up data, and Whipple suggests that they do so daily.

“People used to rail at me about having a strict backup policy,” Whipple says. “I don’t hear anybody complaining now.”

—Philip Michaels

Cool Stuff

Thin Is In

At just an inch thick, the Titanium PowerBook G4 stands out as one of the sleekest, smallest computers available. But since it has only two USB ports, users who want to hook up several external devices either have to endure a tangle of daisy-chained cords or scrap aesthetics by using a USB hub thicker and clunkier than the laptop itself. Keyspan (510/222-0131, www.keyspan.com) clearly understands the problem. Its new USB 4-Port Mini-Hub has as much style—and as little bulk—as the new PowerBook. The hub, which comes in black or silver, is only a centimeter thick—just large enough for a USB connection. With a retractable USB cord, the device isn’t much wider than a credit card, but it’s fully functional. Keyspan’s hub supports both self- and bus-powered modes and will connect up to four USB 1.1 devices directly. The only thing that isn’t tiny is the price: $49. Most other four-port models sell for less money; $20 to $30. But the Mini-Hub will help you save a different and equally important commodity: space.—Matthew Honan
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.
Quick, Quicker, Quicken

When Intuit asked Quicken users what features they wanted in future versions of the personal-finance software, two requests kept coming up—OS X compatibility and improvements to existing tools. You’ll see efforts to meet both requests in Quicken 2002 Deluxe for the Mac. And while Mac users making the switch to OS X will appreciate a native version of the application, time-saving additions to Quicken are likely to have the biggest effect on how you use the software.

Newly Carbonized, Quicken has adopted OS X’s Aqua look and feel. Under the hood, Intuit says, users of Quicken 2002 will notice improvements in performance and stability when running the program in the new OS. The $60 program (less a $20 rebate for users upgrading from prior versions) also runs on Mac OS 9.0.4 and later. Regardless of the OS you use, Quicken 2002 has these new features (see below).—PHILIP MICHAELS

HARDWARE

DIGITAL CAMERAS
- A 4.1-megapixel camera from Canon (800/652-2666, www.usa.canon.com): The PowerShot G2 ($899) has a 3X optical zoom and a 3.6X digital zoom.
- Three digital cameras from Fuji Photo Film (800/800-3854, www.fujifilm.com): The FinePix A101 ($179) is a 1.3-megapixel camera with a 2X digital zoom. The FinePix A201 ($249) is a 2-megapixel camera with a 2.5X digital zoom. The FinePix A205 ($299) is a 2-megapixel camera with a 2.5X digital zoom.

• A 4.1-megapixel camera from Olympus America (800/622-6372, www.olympusamerica.com): The Camedia D-40 Zoom ($799) sports a 2.8X optical zoom and a 2.5X digital zoom. It will ship in October.

MP3 PLAYERS
- A successor to the Rio 300 MP3 Player, from SonicBlue (800/468-5846, www.riohome.com): The Rio One comes with a USB connection and 32MB of memory, upgradeable to 160MB. It supports MP3 and Windows Media formats. ($100)

PRINTERS
- A color ink-jet printer from Canon (800/652-2666, www.usa.canon.com): The S200 Color Bubble Jet Printer ($79) has a color resolution of 2,880 by 720 dots per inch, a 2.8X optical zoom, and a 6X digital zoom. It prints 5 pages per minute in black-and-white and 3 pages per minute in color. It ships in October.

Screen Saver

Jamie Dresser, purchasing manager for new-product development at Other World Computing (800/275-4576, www.macsales.com), was looking for a way to protect his PowerBook from the scuffs that can appear on the screen when it rubs up against the keyboard. So he turned to a low-tech, but effective, solution: a swath of tanned cowhide. From these humble origins was born the S15 Laptop Screen Protector, an 11.5-by-5-inch piece of black leather that Other World Computing sells to users of any Mac portables. The strip keeps your laptop’s keyboard—and the oily residue from your fingertips—from contacting the screen when you snap your Mac shut. And if cruel fortune saddles you with some Windows-running monstrosity, the Laptop Screen Protector has you covered there, too.—PHILIP MICHAELS

a cordless pen, new digital-oversampling technology, and a cordless mouse. The tablet comes in five sizes: 4 by 5 inches ($220), 6 by 8 inches ($400), 9 by 12 inches ($510), 12 by 12 inches ($570), and 12 by 18 inches ($820).
APC introduces the best protection available for your Mac.

8 million computer users can’t be wrong about APC power protection

Don’t let a lightning storm destroy your Mac system in the blink of an eye. Your hard drive, modem and RAM are all at risk, not to mention peripherals like your zip drive, scanner, monitor and printer. Rely on an APC Back-UPS Pro® to save your investments from high voltage surges.

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* (see policy for details)

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- Auto-shutdown software that saves your files and data, even when you’re away from your computer
- Audible and visible alarms alert you to power events as they occur
- $25,000 Equipment Protection guarantee
- 2 year comprehensive warranty
- iMac colored configurable speaker guards to match your computing environment
- APC Back-UPS Pro® 500: “APC’s latest plugs into a USB port, making it completely painless to protect your PC from power snafus and electrical spikes.” - PC Computing 4/99
1. Apple wins an Emmy Award for FireWire. Meanwhile, the makers of USB hold out hope for a Golden Globe.

2. Microsoft readies Office v.X for OS X. Next up for Microsoft: Carbonizing Steve Ballmer to make him more stable.

3. Hewlett-Packard is buying Compaq for $25 billion. Consumers sigh with relief. “We could never tell their computers apart anyhow.”

**SOFTWARE**

**DEVELOPMENT SOFTWARE**
- CodeWarrior 7.0 from Metrowerks (800/377-5416, www.metrowerks.com): The latest version of the development software supports both the classic Mac OS and OS X, allowing programmers to develop a single application that runs on either version of Mac OS ($599; $299 for license renewal).

**EDUCATION SOFTWARE**
- Accordance 5.0 from OakTree Software (877/339-5855, www.oaksoft.com): The latest version of the Mac-only Bible program adds Window and Amplify palettes for easier text access and an enhanced search window ($139 for standard level; upgrades start at $49).
- New and updated educational software from School Zone Interactive (800/253-0564, www.schoolzone.com): The Flash Action series features updates to the Addition/Subtraction and Multiplication/Division titles ($15 each) for faster playback and an enhanced built-in teacher component. School Zone’s Electronic Workbooks series, aimed at preschoolers through fourth-graders, adds two new titles: Time, Money & Fractions and Vocabulary Puzzles 1 ($20).

**GRAPHICS SOFTWARE**
- LightWave 3D 7.0 from NewTek (800/847-611, www.lightwave3d.com): The updated 3-D-animation and -rendering software, which runs in both OS 9 and OS X, adds a motion mixer for nonlinear animation; a tool for building hair, fur, and landscape creation; and a new depth-of-field filter, among other features ($2,495; $1,495 for upgrade).

**PRODUCTIVITY SOFTWARE**
- OCR software from Abbyy (877/328-2229, www.abbyyusa.com): FineReader Pro 5 for Mac is Abbyy’s first OCR software for the Mac OS. FineReader converts scanned images into editable text that retains the original layout ($129 to upgrade from any OCR software).

**NETWORKING SOFTWARE**
- An OS X-native version of Timbuktu from Netopia (800/485-5741, www.netopia.com): Besides compatibility with OS X, Timbuktu Pro 6.0 adds large-file support to the remote-control networking utility ($180; upgrade pricing varies).

**ANNOUNCED**
- An Emmy award for Apple (800/692-7753, www.apple.com): The company received a 2001 Primetime Emmy Engineering Award from the Academy of Television Arts & Sciences for FireWire’s impact on the television industry. Apple developed the data-transport technology known as the IEEE 1394 standard—Compiled by PHILIP MICHAELS

**Mac Beat**

**Mac OS X UPDATES**

**America Online 14B**
Beta version of online service’s OS X client

**Apple Darwin Streaming Server 3.0.1**
Server for streaming QuickTime data

**bManager 1.0.1**
Bug fixes for contact manager

**Contact This 1.1**
Entourage address book importer for Mail

**Griffin iMate X 1.0b5**
Driver beta for ADB-to-USB adapter

**Interarchy with FTP Disk 5.0**
File transfer, server/network info tool

**IspQ VideoChat X 5.0.1**
Internet Video chatting/conference software

**LiveStage Pro 3.0.1**
QuickTime 5 interactive authoring environment

**MacGhostView 2.2**
General purpose PostScript and PDF previewer

**MacMAME 0.53a**
Port of PC multi-emulator for classic arcade games

**MacSQL 2.0.1**
SQL database management tool

**Mesa 3.0.2**
Improved Excel import for spreadsheet software

**Mystery Island II 1.1.1**
Bug fixes for adventure game

**Netscape X 6.1**
Beta of native Web browser and e-mail client

**OmniGraffle 1.1.1**
Diagramming and graphic software

**RBrowser 2.9**
Full-featured graphic FTP/SSH client

**RealBasic 3.5**
Development software

**Samhill 6.2**
Server log analysis tool

**sMailing 1.6**
Utility for sending personal e-mail to multiple addresses

**SQL4X 1.3**
Cocoa-based MySQL installer

**Tex-Edit Plus X 4.13b2**
Beta of text editor

**TextSoap 3.0.1**
Filters to clean up text and e-mail formatting

**VST Tri-Media Reader X 1.0.0**
Driver for smart media reader

**Who’s There? X 1.1**
Analysis tool for access attempts detected by firewall

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**ScreenWriter 3**
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**PlateMaker 3**
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- Output up to 13" x 35.5"
Lease price per month*: $205.00

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- Output up to 13" x 35.5"
- Fast RISC processing
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**FilmMaker 4**
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- Resolution up to 2400 dpi
- Output up to 13" x 35.5"
Lease price per month*: $113.00

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*Lease Prices based on 36 month lease.
Hands-on Evaluation and Authoritative Buying Advice

Power Mac G4/800 Dual Processor
High-End Machine Shows Off Mac OS X’s Multiprocessor Fluency

By Rick LePage

Apple has been selling dual-processor Power Macs for a while now. But multiprocessing as a technology has met limited acceptance among Mac users, finding a home mainly among graphics professionals wanting maximum performance from their workstations. Apple’s latest dual-processor offering, the $3,499 Power Mac G4/800 DP, has a very good mix of performance and features that will appeal to the traditional graphics customer. But it’s also an excellent Mac OS X machine, showcasing the new operating system’s symmetric multiprocessing capabilities.

Built for Speed
The G4/800 DP comes with two 800MHz PowerPC G4 processors, each with 2MB of Level 3 cache; 256MB of RAM (with room for 1.5GB total); a fast 80GB 7,200-rpm UltraATA/66 hard drive; a DVD-R/CD-RW SuperDrive, which can create both CDs and DVDs; and an Nvidia GeForce2 MX TwinView video card in a 4x AGP slot, which can drive a newer Apple display (one with an Apple Display Connector) and a VGA monitor simultaneously. Apple has also outfitted the machine with its standard array of expansion slots:

- two USB ports
- two FireWire ports
- a 56K V.90 internal modem
- an AirPort slot
- four internal PCI slots in addition to the 4x AGP slot.

Our unit shipped with Mac OS 9.2.1 and Mac OS X 10.0.4, Apple’s iMovie 2.0 and iDVD 1.0, and Smith Micro’s Faxstf fax software. By the time you read this, the G4/800 DP should include iDVD 2.0 and Mac OS X 10.1, which will support CD-R and DVD-R burning.

It’s sprightly overall, but as a basic Mac OS 9 machine, the G4/800 DP is not as fast as the top-of-the-line, single-processor Power Mac G4/867 (****; Reviews, October 2001) on tasks or applications that don’t take advantage of the dual processors (for example, Microsoft Word, Intuit’s Quicken Deluxe 2001, QuarkXPress, and Mac OS’s Finder). The G4/800 DP came up a bit short.
in our Speedmark and Quake (OS 9 version) benchmark tests—due to the slower 800MHz chip and the fact that the applications are not multiprocessor-aware.

You’re not going to pay $1,000 more for a dual-processor machine if all you run are business applications, a Web browser, and an e-mail program; it’s designed for software that’s optimized to take advantage of the second G4. For Mac OS 9 this includes Apple’s Final Cut Pro; Adobe Photoshop, Premiere, and After Effects; Maxon Computer’s Cinema 4D XL; and Terran Interactive’s Media Cleaner Pro. (See www.apple.com/powermac/multiprocessing.html for a list of multiprocessor-capable applications.)

In our tests, tasks in Cinema 4D and iTunes went faster with the additional G4 processor. Some programs are more optimized than others; for example, in the Cinema 4D complex-rendering test, the G4/800 DP lopped more than 40 percent off the G4/867’s time; with the iTunes MP3 encoding task, it showed smaller but still appreciable margins.

Since not all Photoshop filters are multiprocessor-aware, performance with Adobe’s imaging application was mixed. Filters such as Gaussian Blur and Unsharp Mask take advantage of the G4/800 DP’s extra processor, so its times were slightly better than the G4/867’s. But the G4/867 was faster in the RGB-to-CMYK conversion test—as you would expect, since this function is not optimized for multiple processors.

**Zooming to the Future**

If the G4/800 DP ran just Mac OS 9 and a few multiprocessor-friendly applications, it might be appropriate only for a narrow niche of creative professionals. For many general-purpose users, the single-processor 867MHz model would be a more cost-effective purchase.

The arrival of Mac OS X—a fully threaded operating system that takes advantage of every processor you throw at it, for almost any task—mixes things up considerably. With the new OS on a dual system, you’ll see performance improve even if all you run are applications that aren’t optimized for multiprocessing.

When we restarted our G4/800 DP in OS X, it became a whole different Mac. Everything was zippierto-applications launched faster, background processes didn’t bog it down, the OS as a whole was more responsive, and even OS X’s Classic mode felt as fast as OS 9 on a 733MHz Power Mac. Photoshop 6.0.1 running in Classic felt snappy; many filter operations on large files were only a second or two slower than in OS 9.2.1.

We also loaded a prerelease version of OS X 10.1 on our unit and noticed a further performance improvement over version 10.0.4. That bodes well for users who want extra processing power in Mac OS 9 can buy the G4/800 DP now and rest comfortably in the knowledge that, when they’re ready to move to OS X, their investment in multiprocessing will continue to pay off.

**Minor Drawbacks**

As we wrote in our review of the single-processor 867MHz Power Mac—which uses the same quicksilver case as the G4/800—two aspects of the new G4 design are worth mentioning. One is the absence of a manual-eject button for the SuperDrive tray; you need the Apple Pro Keyboard or a control-strip module to open the tray. The other common complaint is the lack of an audio-in port, though the increasing number of USB audio products makes this a minor issue.

Another item to note is that the G4/800 DP originally shipped with Mac OS X 10.0.4, which didn’t support CD-R or DVD-R burning. The problem is solved in OS X 10.1, which adds those capabilities.

**Macworld’s Buying Advice**

Like Apple’s earlier dual-processor machines, the Power Mac G4/800 DP is a very good fit for any Mac user who works with Photoshop, Cinema 4D, Final Cut Pro, or other multiprocessor-aware applications. But it’s also ideal for anyone looking to make the leap to Mac OS X: the G4/800 DP showcases nearly every aspect of the new operating system’s multiprocessing capabilities. Graphics pros who want extra processing power in Mac OS 9 can buy the G4/800 DP now and rest comfortably in the knowledge that, when they’re ready to move to OS X, their investment in multiprocessing will continue to pay off.
Mac OS X Server 10.0
New Edition Delivers Features but Falls Short in Documentation

BY MEL BECKMAN

When Mac OS X Server appeared two years ago, pundits and users alike welcomed it as an excellent first effort (Reviews, July 1999). With a Unix foundation, advanced network support, preemptive multitasking, and remote client support, it made the Mac a contender as a solid workgroup and Internet server. But because Apple has issued only a smattering of minor updates and patches since the server's release, Mac users have been impatiently awaiting the first major upgrade.

They won't be disappointed by what Apple has delivered with Mac OS X Server 10.0.4. It has an Aqua user interface, identical to its desktop counterpart; a raft of Web-publishing tools, including PHP, MySQL, Java Server Pages, and WebDAV; significantly better remote administration; many performance improvements; and some minor enhancements. Dishearteningly, though, Apple has fallen short in two very important areas: documenting all of Mac OS X Server's features and providing a complete set of graphical administration tools.

Package Deals
OS X Server now comes in two packages, one for ten users and one for unlimited users. Apple has removed the WebObjects development environment—you get support only for executing WebObjects—and added software-license protection, although the licenses are not time-limited. And current users must pay full price for the new edition; there's no upgrade path. The package consists of five CDs containing OS X, WebObjects 5 Deployment, Macintosh Manager, NetBoot, and Developer Tools.

OS X Server's documentation consists of a Getting Started card and a 250-page Admin Guide (on CD-ROM) that briefly describes only OS X Server's most popular features. We tolerated weak documentation with OS X Server's first incarnation, but Apple promised to do better this time around. Although the Admin Guide is a useful overview of some available services, it's a far cry from what users expect from a $1,000 product. Missing are details on administering Apache, on activating various Web-programming tools, and on critical troubleshooting tasks such as disk recovery. Instead of providing this information, the Admin Guide directs you to the third-party document for that component, leaving you to make the leap from there to the OS X Server environment.

Installing the full product is easy—one click and it's running. Upgrading an existing OS X Server installation, however, is an ordeal. Apple provides a migration tool for...
exporting user and group information, but you must offload all your own files and applications, folder by folder. You then copy them back to the same places after installing OS X Server on top of the old OS X partition, which eradicates everything that was there. Because OS X's directory structure tends to scatter user files to many obscure folders, this is a daunting task—and one that will annoy Mac users who expect the old System Folder's simplicity.

Once installed, OS X Server provides a host of improvements. The most obvious is the Aqua look and feel, which reunites the server and desktop interfaces. In fact, OS X Server is basically the desktop version of OS X with some additional components: remote server administration, Web-programming tools, advanced file and print serving, and centralized directory services. The two versions have the same core Unix operating system, but OS X Server adds performance improvements, updates to Apache Web server, and many new administrative and Web-programming tools.

The Meat and Potatoes
A new program called Server Admin, which runs on OS X Server or OS X (but not on OS 9), allows you to remotely configure and control Web, file, print, user, and network functions. Server Admin also lets you browse log entries and check the status of various OS X software services, and you can install it on multiple machines. Because Server Admin doesn't cover all the bases, the 10.0.1 patch added Secure Shell (SSH), an open-source utility that gives you secure, encrypted command-line access from anywhere on the Internet. But the program could do much more. For example, the only DNS function you can execute is turning DNS on or off; you can't configure it or view the contents of the DNS database. Compare this with Windows DNS, which has had a remote graphical interface for years.

Web programmers will love OS X Server's preinstalled support for the PHP 4.0.4 programming language; the MySQL 3.23 database; Java Server Pages; and WebDAV, which lets you use drag-and-drop techniques to publish Web content. These tools are enough to help you get an e-commerce site up and running without purchasing any additional software. In addition, they open up a whole world of Web applications heretofore unavailable on the Macintosh, including catalog and order processing, inventory control, scheduling, and interactive messaging—and many of these applications are free for the asking.

Several miscellaneous new features enable OS X Server to coexist with other platforms: Windows and Unix file sharing; LDAP authentication; IP filtering; a graphically configured mail server; and PostScript-compatible print serving for Mac, Windows, and Unix users. The new IP Filter function beefs up security, but it isn't as secure as a stand-alone firewall, such as SonicWall. The new mail server is just fine for light duty, but it's hardly a match for commercial OS X mail servers such as Tenon Intersystems' NetTen or Stalker Software's CommuniGate Pro (Reviews, September 2001). And despite OS X Server's improved server-configuration aids, Tenon's iTools still provides superior graphical configuration for Apache, SSL, and DNS.

Speeds and Feeds
When you compare the new release with OS X Server 1.2 running on identically configured Macs, you'll notice that its Aqua interface can take a bit longer to manipulate windows. However, network services, such as Web hosting and file transfers, seem snappier. Informal tests showed OS X Server 10.0 accommodating three to four times as many Web requests per second as version 1.2. Apple hasn't said exactly what it changed within Apache, but the server contains several new modules that the company doesn't provide source code for, and these modules may account for the speed improvements. Release 10.1, which Apple promises will be available as a free upgrade by the time you read this, is expected to significantly improve the speed of Mac OS X Server.

Macworld's Buying Advice
If you're currently running AppleShare IP without problems—and if you don't need Mac OS X's cross-platform or Internet-server features—there is little reason for you to migrate; Mac OS X Server offers minimal performance improvement over AppleShare IP. Similarly, schools or small workgroups using MacManager or OS X NetBoot won't find any major advantages in OS X Server. However, if you are rolling out Web-based applications or in need a robust Internet server, OS X Server is a good choice—as long as you have Unix-savvy technical talent who can manage to configure it using the incomplete documentation.
Wireless Broadband Routers
AirPort Alternatives Let You Cut the Ethernet Cord

BY BRETT LARSON AND JASON COX

Do you want to take advantage of a wireless network while at the same time sharing your broadband Internet connection? Thanks to a new breed of routers based on the wireless technology used in Apple’s AirPort Base Station, you no longer need to purchase both a router and a Base Station to achieve this goal.

Macworld Lab tested six routers ranging in price from $220 to $379: the FriendlyNet FR3002AL, from Asante; the AirStation, from Buffalo Technology; the XRouter Aero, from Macsense Connectivity; the UGate-3300, from Macsense Connectivity; the Netline Wireless Broadband Gateway, from Proxim (formerly from Farallon); and the Barricade Wireless Broadband Router, from SMC Networks. We found that while these routers generally offer significant advantages over the $299 AirPort, they aren’t right for every network; unlike the AirPort, which has a built-in 56K modem jack, none of these routers support analog modem connections.

No Manual Labor
You set up a wireless router as you would any router: by connecting it directly to your computer and configuring it via a Web browser. We tested these routers on a network comprising a 500MHz Power Mac G4 (used to configure the routers), a Flower Power iMac, and an indigo iBook. All our machines were equipped with AirPort cards, but PowerBooks from 1999 and earlier can also use Proxim’s SkyLine Wireless PC Card (www.macworld.com/2000/08/09/reviews/skylinel.html) or Lucent’s Orinoco PC Card Silver (www.macworld.com/2000/06/features/cutloose_sb1.html).

All the routers we tested include either printed or PDF setup instructions; the FriendlyNet comes with both. Most of the routers offer Mac-specific setup instructions, even though setup usually takes place in a browser, making the process identical for both Macs and PCs. The exceptions are the Barricade, which nonetheless has adequate instructions for Mac setup, and the AirStation, which comes with a Windows-only setup application. Although you can set up the AirStation through a Web browser, the manual doesn’t mention this. (Buffalo Technology says it plans to include Mac-specific instructions in the future.)

Configuring a wireless router isn’t much more complicated than setting up a broadband Internet connection: simply enter your IP address (if it’s static), DNS server IP numbers, a gateway address, and a router address. If you’re using a DHCP network, check the appropriate box during the setup process, and the router will retrieve your TCP/IP information for you. If you’re using a PPPoE network, setup is even easier: type in your name and password, and the router takes care of the rest.

All but one of the routers had easy-to-follow directions: the AirStation’s on-screen instructions were frequently confusing. In contrast, we found that the simple, intuitive interfaces of the Netline, UGate-3300, XRouter, and FriendlyNet made for easy setup.
# Wireless Broadband Routers Compared

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<td>888/491-4067, <a href="http://www.asante.com">www.asante.com</a></td>
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<td>$305</td>
<td>Mac OS 9, X</td>
<td>800/508-1110, <a href="http://www.buffalotech.com">www.buffalotech.com</a></td>
<td>Four-port switch.</td>
<td>No Mac-specific instructions; expensive; not upgradable.</td>
</tr>
<tr>
<td>MaxGate</td>
<td>UGate-3300</td>
<td>★★★½</td>
<td>$220</td>
<td>Mac OS 9, X</td>
<td>800/284-8985, <a href="http://www.margate.net">www.margate.net</a></td>
<td>Inexpensive; upgradable wireless PC card; easy setup.</td>
<td>Only two ports.</td>
</tr>
</tbody>
</table>

Using both Mac OS 9.1 and Mac OS X, we tested the wireless routers by performing a variety of activities: FTP downloads, checking e-mail, surfing the Web, and sharing files (via AppleTalk and AFP). In all our tests, the routers worked well and presented no problems.

### Airborne Advantages

The six routers we tested have one significant advantage over the AirPort Base Station: each includes at least two Ethernet ports. Having two ports means that you can use one for your Internet connection and one for your local network, keeping the two connections on separate lines for better security.

The Barricade has a third port, and the AirStation and XRouter have a built-in four-port 10/100 switch. With the additional Ethernet ports, you can network older Macs via Ethernet and new Macs via AirPort, even if you have a cable modem or DSL—something you can do with AirPort and the two-port routers only if you buy an Ethernet hub.

A distinct advantage of the Netline, the FriendlyNet, and the UGate-3300 is that they’re all easy to upgrade. Each has a built-in PC slot that holds a removable 11 Mbps wireless networking card: the Netline comes with a Proxim SkyLine Wireless PC Card; the FriendlyNet, with an AeroLAN card; and the UGate-3300, with an Intersil Prism card.

Because the PC Card determines your maximum network speed, you’ll need to purchase only a new PC Card, rather than a whole new router, to take advantage of higher network speeds. And using a PC Card doesn’t give these routers significantly less range than that of the Barricade and the XRouter, which both sport antennas. (Buffalo Technology sells an $80 antenna for the AirStation to extend its range.)

The FriendlyNet has a unique feature that rids your Mac of one more cable: a built-in, Mac-compatible print server. Although the UGate also has a print server, it doesn’t support Macs.

### Security Alert

Be forewarned: whenever you’re using a wireless router, your data is essentially up for grabs. These routers need to encrypt data to protect it from any prying eyes within range. The Netline, the UGate-3300, and the FriendlyNet offer 128-bit encryption; the Barricade and the AirStation follow, with 64-bit encryption. The XRouter offers the same 40-bit encryption as the AirPort Base Station. While all these encryption levels are sufficient to discourage the casual eavesdropper, none offers true security. If you routinely transfer highly sensitive information, a wireless router—even one that adheres to the most current security standards—is probably not for you.

The FriendlyNet suffers from a security incompatibility with the Apple AirPort card. Because the router and card process the WEP (Wired Equivalent Privacy) protocol Security Key differently, the card doesn’t recognize the key you enter and leaves your data unencrypted. Although the manual recommends disabling security features on both the card and the router so they can be used together, there’s an easy workaround: type a $ sign before the security key for the router and the AirPort card.

### Macworld’s Buying Advice

Whether you’re adding wireless technology to an existing network or setting up your first network, MaxGate’s UGate-3300 is an excellent choice; it offers a high level of encryption and upgradability at an exceptional price. If you need to network old and new Macs together, Macsense Connectivity’s XRouter Aero is a good option; through its built-in four-port 10/100 switch, even Macs without AirPort cards can join the network.

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**More Info:**
- [Read our collection of tips on getting the most from Apple’s AirPort technology.](www.macworld.com/2000/06/features/cutloose.html)
- [Our feature “Your High-Tech Home” compares the wired life with the wireless.](www.macworld.com/2001/05/features/modern.html)
Adobe PageMaker 7.0
A Single, Flawed New Feature Makes for a Forgettable Upgrade

BY GALEN GRUMAN

For Adobe PageMaker users, 7 is not a lucky number. Instead, it's a false promise of a major revision to the company's former flagship publishing standard. The new Adobe PageMaker 7.0 is simply the almost five-year-old PageMaker 6.5 with a few file-format updates, as well as a quirky new data-merge plug-in.

**Obvious Updates**

Version 7.0's file-format updates are what you'd expect: Microsoft Word 2001, Adobe Illustrator 9, and Adobe Photoshop 6. The ability to import PDF files, on the other hand, is a great addition, and the import filter alerts you to font, color, and separation issues. The inclusion of Distiller 5 for creating PDF files is also welcome, as is tighter integration of the PDF tools with PageMaker's export interface.

But PageMaker's most hyped new feature, the data-merge plug-in, is a huge disappointment. Although it lets you import graphics and text to create mail-merged letters and simple catalogs from any comma-delimited text file—it's quirky and maddening to use.

Creating a data form is simple: you select the data file from the plug-in's palette, and it reads the first row of data to determine the field names. A field name that begins with the @ character indicates the name of an image file to be imported. Unfortunately, you can't use a dialog box to choose the folder or drive containing the file to be imported; instead, you must type something like `Mac Start:Real Estate Project:Photos:123 Broad St.tif`. Be careful—one typo, and your file won't import. You also need to be careful when merging records, since PageMaker puts each record on its own page by default.

The actual import works well enough, as long as your PageMaker document has nothing else in it. When I tried to merge data into a PageMaker document containing other text and images, PageMaker 7.0 went haywire and copied the entire document at the beginning of each record. Adobe says the data-merge tool is intended only for mail merges, where an entire letter is duplicated with a unique name and address in each copy.

**Beyond offering neither substantive new features nor fixes for long-time defects such as its separate, inadequate table editor, PageMaker 7.0 has a few other flaws. For one, it's a memory hog. While version 6.5 needed between 9MB and 20MB of RAM, the default minimum and preferred memory settings for version 7.0 are 15MB and 32MB, respectively. But even with those settings, I got frequent memory errors. And Adobe has no plans to Carbonize PageMaker 7.0 (though I had no trouble using version 7.0 in Mac OS X's Classic mode).**

**The Rest of the Story**

PageMaker 7.0 is nearly identical to version 6.5 ([www.macworld.com/1997/05/reviews/3659.html](http://www.macworld.com/1997/05/reviews/3659.html)), whose big push was online publishing. However, those features were difficult to use and produced mediocre Web pages, and they're no better in version 7.0.

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**Basic Database Publishing** PageMaker 7.0's new data-merge feature lets you create basic catalogs—but only if the document is otherwise totally empty.

**Macworld's Buying Advice**

Compared with QuarkXPress and Adobe InDesign, PageMaker is labor-intensive, so it's best suited to basic jobs involving simple designs and few pages. If your goal is to produce documents that look as though they were created in something more capable than a word processor but that don't require the high level of design that QuarkXPress and InDesign offer, PageMaker may be all you need—just beware the pitfalls of the new data-merge tool. m
Who would believe that scanner technology could evolve this quickly.
(Mr. Darwin would be quite proud.)

The new Super Coolscan® 4000 ED film scanner resurrects old photos with such clarity you can see why we wanted to show a "before" and "after" demonstration. Very simply, with its Nikkor optics, LED lightsource, Digital ICE™ technology, and 42-bit color, you get the most amazing, colorful scans imaginable. And its incredible speed and flexibility let you handle more scans in a fraction of the time without having to spend time adjusting for color correction and image quality. In addition, you can even correct for imperfections on recent shots. The new Super Coolscan 4000 ED allows you to use pictures you didn't think you could use, which, in turn, leads to bigger profits.
Macintosh users in a Microsoft Exchange community fight a constant uphill battle for compatibility with their Windows-based neighbors. Until just recently, Mac users could barely exchange formatted e-mail messages with Windows Outlook users, let alone participate in the rich traffic of Exchange calendars, meetings, task and contact lists, notes, and document archives enjoyed by their Windows colleagues.

Those days are over. Microsoft Outlook for Mac 2001 offers feature parity with the Windows version, letting Mac users participate in group scheduling, share address books, collaborate on projects, and publish documents. It even has a few features—such as drag-and-drop copying and easy setup—that Outlook for Windows doesn't, and the Mac interface makes this version more user friendly than its Windows counterpart. There are only two real disappointments: Outlook 2001 doesn't run natively in Mac OS X—you can run it in OS X's Classic mode, but performance suffers—and it requires Microsoft Exchange Server.

Improved Interface
Outlook 2001 is easy to install: simply drag the application folder from the CD to your hard drive, and the program self-installs when you first launch it. A startup wizard walks you through the initial configuration, offering context-sensitive troubleshooting advice if things go awry.

Once launched, Outlook presents a single multipaned window displaying mail, calendars, contacts, and other Exchange resources. Overall, the new interface is very pleasing, even though it lacks the Aqua sheen that users are starting to expect. And Mac-friendly features abound: message-preview zooming magnifies those insanely tiny Windows fonts, for example, and the Mac's Keychain security feature saves your password for you. Interactive documentation via the program's Mac Help Center puts how-to information at your fingertips.

Behind the slick interface, Microsoft has added a mountain of new capabilities. A full-featured calendar keeps track of appointments and lets you share them with others. You can have calendar items sent automatically to other Outlook users and create public calendars for jointly managing vacation or project schedules.

A meeting planner helps you arrange meetings with multiple users. You choose several users from an address book, display a consolidated view of all their schedules, and select a compatible time or let Outlook 2001 choose one for you. All invitees get an e-mail message about the suggested time, which they can confirm or, with permission, reschedule.

Shared folders let you delegate management of some or all of your Outlook functions to another person. A feature unique to Outlook 2001 for Mac is the Sharing Panel, which consolidates permission controls for all Outlook functions in a single dialog box; Windows users must click through dozens of windows to configure sharing and delegation.

Beyond the lack of native OS X support, one minor omission remains: HTML mail formatting. Outlook 2001 converts incoming HTML messages to RTF format and doesn't let you compose HTML mail messages. Windows users don't suffer these limitations.

Macworld's Buying Advice
Outlook 2001 is elegant and responsive in Mac OS 9, but it drags somewhat in OS X's Classic mode, and the user interface isn't up to Aqua standards. Still, if you're living in a Microsoft Exchange corporate culture, you have to get along—and with Outlook 2001, you finally can.

Macworld's Buying Advice
Outlook 2001 is elegant and responsive in Mac OS 9, but it drags somewhat in OS X's Classic mode, and the user interface isn't up to Aqua standards. Still, if you're living in a Microsoft Exchange corporate culture, you have to get along—and with Outlook 2001, you finally can.
One Evolution Deserves Another

Introducing MacLinkPlus Deluxe 13

The #1 Survival Kit for Mac Users in a Windows World

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

For the past 17 years, DataViz has continually improved compatibility between different platforms. Now, MacLinkPlus Deluxe 13 takes full advantage of the new features in OS X.

Don’t get caught with a file you can’t open! To buy or upgrade your current copy of MacLinkPlus Deluxe, visit our website or our fine software retailers.

www.dataviz.com/mwspecial
1.800.808.4825
Panorama 4.0
Speedy RAM-Based Database Goes Cross-Platform

BY GEOFF DUNCAN

ProVue Development’s Panorama has been hailed as a speedy, flexible database since its 1988 debut. With version 4.0, Panorama is finally native to Windows and PowerPC (though not to Mac OS X), so you can now easily share Panorama databases with PC-using colleagues. Panorama 4.0 may be the ultimate relational database for your desktop—as long as you don’t need extensive workgroup or Web-publishing features.

Thanks for the Memory
Panorama has always blown away competing products, such as FileMaker Pro and 4D, in the performance department, because it keeps data in RAM instead of constantly shuffling information on your hard drive. Searching, sorting, and replacing are amazingly fast, even in huge databases: searching more than a million Web-server log entries for a unique record took less than half a second on a beige Power Mac G3/300.

FileMaker Pro may be lauded for its easy database-form creation, but that program’s results have nothing on Panorama’s user-friendly databases. These databases’ interface tools are powerful and flexible, and they’re fully relational, so you can link multiple databases to better manage and organize your information. Swift cross-tab and summary features encourage you to analyze your data more deeply.

New wizards help you create databases, enter complex formulas, edit form and window properties, manage fonts, and more. You can use AppleScript to communicate with other applications or to trigger procedures written in Panorama’s built-in programming language. Panorama 4.0 also provides comprehensive documentation in the form of well-written PDF files and QuickTime video demos.

Age before Beauty
Panorama may be powerful, but it’s showing its age. For example, dialog boxes are modal and immobile—you can’t switch to another application or online help while one is open; nor can you move a dialog box to reveal information in other windows. Objects remain limited to a palette of 256 oversaturated colors, and many features seem to have been tossed into the program rather than thoughtfully designed; some are easily accessible, while others can be reached only via a modal dialog box. Panorama 3.0 introduced the capability to share databases (and subsets of databases) among multiple users via Everyware’s Butler SQL. Panorama 4.0 has this capability, but Butler has been a dead product since Pervasive Software acquired Everyware in 1998. ProVue plans to introduce a new server for sharing Panorama databases, but until then, Butler is the only means of enabling multiuser access.

And while Panorama’s speed and flexibility could someday make it a fantastic Web-enabled-database program, it still has no built-in Web-publishing capabilities and can’t be used with middleware such as Blue World Communications’ Lasso.

Macworld’s Buying Advice
Although Panorama 4.0’s age makes it a little eccentric, the program lets you create powerful databases whose interfaces, features, and performance blow FileMaker Pro out of the water. The only real drawbacks are the absence of Web-publishing options and the fact that multiuser access is currently available only by way of a defunct SQL database product. m
Monochrome Handhelds
Palm m500 and Handspring Visor Edge Offer Light, Portable Power

BY DAVID WEISS

The handheld computers of today pack considerable power relative to their size. The Handspring Visor Edge and the Palm m500 are two of the smallest handhelds available, and they’re similar in many respects, though the Edge offers better connectivity and the m500 has a more compact, ergonomic design.

A Stylish Pair
Both PDAs are decked out in silver brushed aluminum; the Edge is also available in red and blue tints. And both are quite svelte, measuring only a half inch thick. However, at about five inches tall, the Edge is a good half inch taller than the m500. The Edge weighs almost five ounces, while the m500 weighs an even four ounces.

The m500 has a leather cover that folds back, and you can attach it to either side of the PDA; the stylus slips into a groove on whichever side is free, making the m500 friendly to lefties. In contrast, the Edge’s stylus fits only on the right side, and it clips onto the outside of the handheld, adding bulk. Further increasing the Edge’s girth are a hinge that sticks out and a lid that doesn’t fold back.

Both handhelds have illuminated power buttons, which can be set to blink when you need a silent alarm, and the m500 can be set to vibrate. Both have screens that are easy to read indoors or in sunlight, and both offer reverse backlighting.

On the inside, these PDAs are almost identical. Each ships with 8MB of RAM, a 33MHz Dragonball VZ processor, an infrared port, a rechargeable battery, and a USB cradle.

Reaching Out
Via the USB-cradle port, both handhelds can connect with modems, keyboards, and other peripherals, and both offer additional expansion possibilities. The Edge can connect to SpringBoard modules—including GPS receivers, MP3 players, storage media, and even cell phones—via an included snap-on adapter.

In contrast, the m500 has a slot for SD (Secure Digital) cards for adding storage or content. SD cards don’t require an adapter and are about the size of a postage stamp. No hardware peripherals are available yet for the SD slot, but a few are in development.

The Software Factor
The m500 ships with Palm OS 4.0, which lets you password-protect your handheld, encrypt records, and connect your handheld to a cell phone for wireless e-mail and Web access. The Edge ships with Palm OS 3.5.2H2, and although users can’t upgrade to Palm OS 4.0, version 3.5.2H2 offers all the basic features of its successor.

Palm Desktop, the Mac software that ships with both handhelds, runs in Mac OS X’s Classic mode, but an upcoming OS X-native version will be available as a free download.

Macworld’s Buying Advice
These two handhelds are light, powerful, slim, and Mac friendly. If you like the options that a SpringBoard slot affords and don’t mind a little extra bulk, go for the less expensive Handspring Visor Edge. Otherwise, go with the Palm m500—it’s smaller and has an ambidextrous design.
Matrox RTMac Video Card Enhances Apple's Final Cut Pro

Are you building an editing system around Apple's Final Cut Pro? Check out Matrox's RTMac, a $999 PCI expansion card that kills three video-editing birds with one stone: it allows real-time display of many common transitions and effects, digitizes analog video and audio, and lets you connect a second monitor to your Mac.

The RTMac card boasts two connectors. The first one accommodates a standard VGA monitor, for extending your desktop, and the second one attaches to a breakout box that provides inputs and outputs for S-Video, composite video, and analog audio. If you like, you can connect the video output to a TV monitor to preview your projects. You can also capture analog video and audio using the analog inputs.

The RTMac doesn't accelerate every Final Cut Pro transition, but it will handle cross dissolves, wipes, and slides, among others. The card also accelerates motion and distortion effects, as well as Final Cut Pro's text generators.

Stumbling Blocks

The card delivers immediate gratification when you need it most: during the editing and polishing phases. But when it's time to output a final project to a DV device, you must render all effects. (Alternatively, you can connect your deck to the breakout box and record from its analog outputs; however, this can compromise the video quality.)

And there are other limitations: Complex composites require rendering; the RTMac can't handle more than two video tracks and one title—or two titles and one video track—in real time. Clips with motion blur applied must also be rendered. And for now, the RTMac works only with Final Cut Pro; a software update that enables the card to work with Adobe Premiere should be available by the time you read this.

In addition, the RTMac card causes Mac OS X to be unstable and crash—this is a serious problem if you switch between OS 9 and OS X. As we went to press, Matrox was putting the final touches on a free software update designed to address the problem.

Macworld's Buying Advice

Although Matrox's RTMac won't turn your G4 machine into a real-time compositing powerhouse, it is a huge productivity booster. And its analog-capture features and ability to drive a second monitor are icing on the cake. Despite some flaws, the RTMac packs a lot of value for its price.—Jim Heid
DESIGNED FOR THE WAY YOU WORK

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

Antique frames. Quartz movements. That's my business.

MYOB software is the simplest, most powerful, most complete solution for managing my company on the Mac, from the day to day to the bottom line.

**Antique frames. Quartz movements. That's my business.**

MYOB software works for me.
ETShade Pro R4/E
An Uncomplicated Approach to 3-D

The latest animation export from Japan isn't a movie starring cute creatures with magical powers, but you could make such a movie with ETShade Pro R4/E, from Japan-based ExpressionTools. This 3-D-modeling, -rendering, and -animation program simplifies the production process more than its closest competitor, Eovia's Amapi 3D (Reviews, October 2001), does. But ETShade is limited compared with the more powerful—albeit more expensive—NewTek LightWave and Maxon Cinema 4D.

Keeping It Simple
ETShade's modeling tools generate 3-D objects from simple Bézier curves. Working with these splines is similar to editing curved objects in Adobe Illustrator; in fact, ETShade imports EPS files from Illustrator, as well as files in DXF and LightWave format. The program's straightforward interface simplifies the learning process for 3-D novices, although its reliance on a multitude of floating palettes creates annoying screen clutter.

To form 3-D shapes, you group splines into a curved surface and then convert curved-surface objects into polygons at whatever resolution you choose. ETShade is intelligent enough to insert splines automatically after you add new points to a curve.

Although ETShade's animation tools are logical, they're a bit unconventional. The program relies on objects called Joints; they're the only objects you can animate, so anything that moves in a scene must be linked to them. This approach makes sense for character animation, but it means that correctly setting up mechanical animations requires extra work. A major fault in ETShade's animation tools is the absence of curve-tangent handles on keyframes; the program offers only Slow In/Slow Out adjustment sliders.

ETShade's Phong shader is quick but doesn't render shadows, making it impractical for creating final images. Two ray-tracing modes produce stunning images, but at print or video resolution they take three or four times as long as the Phong shader to render.

Macworld's Buying Advice
ETShade Pro R4/E's ease of use and gentle learning curve make it a great beginner's tool for 3-D novices. (Amapi 3D offers more modeling features and costs half as much, but it's more difficult to learn.) If you're a 3-D professional, you'll appreciate ETShade's rapid modeling and simple workflow for quick-turnaround projects, though you may find its animation tools lacking. But if you use OS X, you'll have to wait until at least the end of the year for a Carbonized version.—MATT LOWRIE

Rating:  ★★★
Pros: Easy to learn and use; high-quality renderings.
Cons: Cluttered interface; limited animation tools; expensive.
Company's estimated price: $1,399
OS compatibility: Mac OS 9
Company: ExpressionTools, info@expressiontools.com, www.expressiontools.com

Online Reviews
Macworld.com

For these reviews:
www.macworld.com/2001/11/reviews/online.html

MP3 software
★★★★ Audion 2.5
★★★★½ Cabrio 1.1.2
★★★★★½ Macast 1.0
★★★★½ MusicMatch 2.0.1

Instructional software
★★★★½ Break It, Fix It, Ride It

3-D modeling software
★★★★ GollyGee Blocks

Multimedia software
★★★★½ Kid Pix Deluxe 3.0

Input device
★★★★½ Kensington Turbo Mouse Pro

Database software
★★★★ ComicBase 6.0

Statistics software
★★★★ InStat 3.0

External modem
★★½ Actiontec 56K USB Call Waiting Modem

USB flash storage
★ Flash USBDrive 16MB
★★★★ Q. USB 16MB

Reviews You Can Trust
OUTSTANDING: ★★★★★
VERY GOOD: ★★★★
GOOD: ★★★
FLAWED: ★★
UNACCEPTABLE: ★
Complete Data Storage Solutions and SAN Systems for Macintosh®

"Time Proven Technology, Field Proven Quality"

- Shared Storage for Video and Publishing Workgroups, Increases Productivity
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- Preconfigured and Ready to go. No Service Tech Required!
- Supports RAID 5, 0+5, 1, 0+1, 0. Enterprise Class Reliability
- Capacities up to 3.6 Terabytes in a Single System
- Rackmount and Tower Designs, up to 20 Drives/sys.

**Fibre Channel RAID Systems**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Add Fast Reliable Data Storage to your Network Without Deploying Expensive Servers</td>
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<tr>
<td>Built-in RAID 5 Storage Array for Data Protection and Speed, up to 6 Drives (600 GB)</td>
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<td>Drives are Hot Swappable, Allowing Hard Disk Servicing Without Down Time!</td>
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<td>Online Spare Drive Option Provides even more Continuous Uptime and Data Protection</td>
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<tr>
<td>Built-in LCD Status Display and Control Panel for Easy Setup and Monitoring</td>
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<tr>
<td>Built-in SCSI Port for Adding Tape Backup (or Even More SCSI Storage!)</td>
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<td>Supports Mac, Windows, Linux and UNIX Clients</td>
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**Network Attached Storage (NAS)**

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<th>Feature</th>
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<tr>
<td>The Ideal Solution for the “Mobile Professional” Capturing DV in the Field!</td>
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<tr>
<td>Up to 140 minutes of DV Recording - Directly from your Camcorder’s 1394 port!</td>
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<td>Plug and go ease of use. Battery Powered (Rechargeable Packs)</td>
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<tr>
<td>Supports Up to 1024 scenes per Disk Pack and AV/C (Audio Video Control Protocol)</td>
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<td>Instant Random Access to any scene, no more Rewinding Tapes!</td>
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<td>Full Remote Control Capability for “Hands Free” Operation</td>
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**Hard Disk Video Recorders (1394)**

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<th>Feature</th>
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<td>LVD, HVD and Single Ended SCSI Storage Systems</td>
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<td>Maximum SCSI Transfer Rates (Up to 160 MB/s)</td>
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<td>Preconfigured and Ready to use</td>
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<td>Support for RAID 5, 1, and 0</td>
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<td>4 and 6 Drive Systems with Capacities to 600 GB/sys.</td>
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<td>Enterprise Class Reliability, Rackmount and Tower Designs</td>
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<td>Options for “Legacy” Macintosh SCSI Systems</td>
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**SCSI RAID Systems**

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<th>Feature</th>
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<tr>
<td>Single Drive Capacities up to 100 GB (That's 7.5 hrs. of DV!)</td>
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<tr>
<td>Mirror Models (Hardware RAID 1) for Maximum Data Protection, an ADTX Exclusive!</td>
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<tr>
<td>Factory Preconfigured. Just Plug them in and they’re Ready to use</td>
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<tr>
<td>Second Generation IEEE 1394 Technology, up to 40MB/s!</td>
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<td>Extra High Capacity “Multi-Drive” Models also Available</td>
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**FireWire Hard Disk Systems**

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<th>Feature</th>
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<tr>
<td>13715 Alton Parkway, Irvine, CA 92618</td>
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<tr>
<td>949-583-2993 Tel. 949-583-2999 FAX</td>
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<tr>
<td><a href="mailto:sales@adtx.com">sales@adtx.com</a> <a href="http://www.adtx.com">www.adtx.com</a></td>
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</table>
DATABASES ARE GREAT PLACES TO STASH INFORMATION, AND THE WEB IS A GREAT PLACE TO PUBLISH DATABASES. YET THE OPTIONS FOR TRANSLATING A DATABASE'S CONTENTS INTO WEB PAGES HAVE BEEN EXTREMELY LIMITED. FOURTH WORLD MEDIA'S WEBSITE 1.6.2 CHANGES THE EQUATION. THIS INEXPENSIVE PROGRAM TAKES THE CONTENTS OF ANY DATABASE THAT CAN BE EXPORTED AS MERGE OR TAB-DELIMITED FILES (INCLUDING FILEMAKER PRO AND MICROSOFT EXCEL DOCUMENTS) AND CONVERTS THOSE CONTENTS INTO STANDARD WEB PAGES.

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**Site Generator** WebMerge's single-pane interface is remarkably easy to use.

**Macworld's Buying Advice**
If you have vital information trapped inside a database application, you may well find that WebMerge is an incredibly quick and easy tool for freeing your data and putting it on the Web.—JASON SNELL

---

**DiskWarrior® Has**

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

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

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

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

Repairs disk problems such as disks that won't mount, files you now with DiskShield to prevent damage to your disks before it...
Extreme Z-IP 2.0
Windows IP Print and File Server Doubles Transfer Speeds

The Macintosh file-sharing service built into Windows transfers files very slowly compared with Windows' native file sharing. Group Logic's Extreme Z-IP 2.01 more than doubles TCP/IP file-transfer speeds for Mac OS 9 and OS X users and makes server access easier as well (although Apple's promised Windows file-sharing support in OS X 10.1 may relegate Extreme Z-IP to OS 9 systems).

Extreme Z-IP runs under Windows NT 4.0 or Windows 2000 Server or Professional (the workstation edition) to provide file and printer sharing via TCP/IP. The program lets Mac users share any Windows directory or—with the optional printer-sharing component, which starts at $675 for ten users—any Windows printer.

Once it's running on a Windows server, Extreme Z-IP lets Mac users see each Windows share as a separate volume in the Chooser or Network Browser. It uses Server Location Protocol to let Mac users choose from a list of available servers, and it supports long- and encrypted-password authentication.

Rating: ★★★½
Pros: Fast; uses Server Location Protocol; good password support.
Cons: Pricey Server edition; optional print function costs extra.
Company's estimated price: Server edition, from $1,175 for ten users; Workstation edition, from $295 for three users
OS compatibility: Mac OS 9, Mac OS X

Macworld's Buying Advice
Extreme Z-IP's Server edition is pricey, but it speeds file transfers by at least 100 percent and costs much less than upgrading to Windows 2000 Server. Small groups can run the Workstation edition on the less expensive Windows 2000 Professional.—MEL BECKMAN
SnapMail 3.0
Intraoffice E-mail Made Quick and Easy

Not everyone needs Internet e-mail; sometimes you simply want to exchange messages with other users on your LAN without the complexities of Internet addressing and the dangers of Internet mail viruses. Glass Bead Software's SnapMail 3.0.4 fills the bill for Mac networks, offering an interface even novices will find easy to use and slick features such as real-time voice and text chat.

SnapMail runs on AppleTalk networks and it requires no centralized server. You install the program on each user's computer, and SnapMail discovers users and adds them to its address book. In addition to the usual e-mail features, such as message folders and text formatting, SnapMail adds some unique twists: reminder messages, customizable form templates, a public bulletin board, and real-time text chat. (An Internet mail gateway is available; it's $97 for five users.)

Although SnapMail is fast and intuitive, it lacks two useful features of traditional Internet mail clients—nested folders and message filtering—that help organize saved messages.

Rating: 4
Pros: Easy to use; requires no server; voice messaging; real-time chat.
Cons: No nested folders; no filtering.
Company's estimated price: from $150 for five users to $2,990 for unlimited users
OS compatibility: Mac OS 9

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It’s no wonder so-called god games are so very popular—they let you control entire worlds and huge populations of people (or creatures) according to your every whim. I admit, some of my darkest hours as the reigning dictator of the game Tropico were dominated by dreams of total control. Cast as El Presidente of a small Caribbean nation, I found the illusion of omnipotence going to my head.

Tropico is the latest title from PopTop Software (makers of Railroad Tycoon II), and it’s published by MacSoft. It’s a real-time strategy game with a 3-D isometric view (or three-quarters perspective).

Banana Republic
Tropico puts an interesting twist on the god-game genre. Rather than having you act as a deity or an industrial tycoon, you’re the dictator of a banana republic. No, not the chain of clothing stores, silly—this banana republic is an island in the Caribbean. As Tropico emerges from colonial obscurity after World War II, your puppet regime must stay in power through whatever means—democratic or fascistic—you choose.

What makes Tropico different from so many other simulation games is that, in addition to influencing economics and planning infrastructure, you must manage the political process of your country. Getting your country running is only one problem you’ll face as El Presidente—keeping it running is another issue entirely.

In Tropico, you can either use a series of preset scenarios with specific goals (guaranteeing fair elections while maintaining power, or undercutting Cuba’s cigar-export business) or create a custom island of your own—determining its altitude, waterline, distribution of vegetation and minerals, political stability, and population.

You can also customize your personality as a ruler, assigning yourself positive traits (hardworking, a man of the people) and negative traits (alcoholic, flatulent). The game’s designers ensure that you’re consistent—making yourself ugly, for example, precludes making yourself charismatic. These traits will affect everything from how the average José on the street sees you to how adept you are at foreign policy. As in the case of flatulence, say, a trait can even affect how much your palace guards are paid to protect you.

Despite such omnipotence over your environment, you’re no Svengali—you don’t directly control what your Tropicans think and do. But you can certainly influence them through your actions (or inaction, as the case may be). Fail to build housing, schools, or clinics for your populace, for example, and you risk the wrath of socialist factions. Place too heavy an emphasis on industrial or commercial development without taking steps to beautify Tropico and reduce pollution, and you’ll incite environmentalists to rally against you. Fail to build and maintain a strong military presence, and you may be ousted by a junta. Meanwhile, you must try to balance effective relationships with the outside world, keeping both los yanquis and los communistas at bay.

Absolute Power Corrupts Absolutely
Of course as El Presidente, you don’t necessarily have to play by the rules. Heck, you can make the rules. If the people demand an election, do you have to listen to them? No! At least, not for a while. And even when you do grant one, you can hire a team of “specialists” to make sure the...
election results are in your favor. Having trouble with a particular insurgent who threatens the stability of your regime? You can make the insurgent disappear, but you'll have to pay for it (and the respect you lose will be damaging).

Other problems are not as easy to solve. If you're serious about making Tropico a better place to live, you'll have to invest extensively in improvements to the tiny country's infrastructure. You will need to plant crops that can be sold or turned into lucrative export goods, such as rum and cigars. You'll need to exploit local resources, such as mines.

As Tropico's citizens grow more sophisticated, they'll expect more from you. They'll want better pay. They'll want to live in houses and apartment buildings rather than squalid shacks. You'll need to build them schools, universities, power plants, and bigger and better sources of entertainment. And you may even want to consider underwriting the development of hotels, spas, and resort locations to bring in tourist dollars.

Of course, you don't have to go the humanitarian route, and for some, this is what makes Tropico so appealing. You can exploit almost every element of Tropico for your personal interest. You can divert money to a private Swiss bank account. You can keep the population under your thumb by imposing martial law and issuing draconian edicts that make it dangerous for the average ciudadano de Tropico to step out of line. In Tropico, it's all up to you.

**Muy Fácil**

Games as complex as Tropico can be intimidating for first-time players. The many tasks to perform and factors to observe can overwhelm. PopTop strongly recommends that first-time players utilize the built-in tutorial, and I heartily agree. The voice of an obsequious crony assists you in understanding the basic game-play mechanics and the interface, and then invites you to experiment with a preset island scenario.

Tropico also comes with a well-written manual that thoroughly explains the game's major elements and provides helpful tables explaining how it works. It even includes brief biographies of famous dictators such as Rafael Trujillo Molina (Dominican Republic) and Manuel Noriega (Panama).

Another suggestion for first-time Tropico dictators is to play your first games in Sandbox mode. You create a custom scenario by lowering the political difficulty to virtually nil and providing yourself with unlimited funds. This way, you can familiarize yourself with the mechanics of the game and learn what works and what doesn't. If not for Tropico's Sandbox mode, I'd never have found out how lucrative a rum distillery can be or how long it can take one to turn a profit.

**Thoroughly Modern Regime**

Tropico is MacSoft's first game to ship with Mac OS X support—it's been Carbonized, and it worked adequately on my G4/500 running Mac OS X 10.0.4.

Tropico supports hardware-based graphics acceleration, so if you have an OpenGL-compatible video card, you'll get smoother graphics and richer colors. But if you don't have a video card that can run Tropico in hardware mode, game play isn't diminished at all—the graphics are detailed and beautifully done even with the software renderer.

Tropico has no online-play component, but that's a minor shortcoming. The game is fully absorbing, and it's a lot of fun even without death matches.

I did have a few problems with Tropico. In Mac OS 9, the game quit on me twice with out-of-memory errors, even though I allocated an appropriate amount of RAM to it. (Be sure to save your game often.) Tropico's speed is also underwhelming in spots, even on a Mac that exceeds the company's minimum recommended system configuration.

**¡Viva Tropico!**

Every so often, I find a game that I fear I'll have to delete from my hard drive, lest I suffer a major productivity hit. Tropico is just that sort of game. I lose hours playing, oblivious to the outside world as I tend carefully to mi país, mi Tropico. If you're a fan of simulation games, you should definitely plan a vacation to Tropico.

Tropico dictator PETER COHEN is normally a mild-mannered senior editor at MacCentral, where the job of dictator is already filled.

Visit www.macworld.com/ubb/Forum25/HTML/000161.html to comment.

**TROPICO**

| Rating: | 4/5 |
| Pres: | Lots of detail to keep armchair dictators happy; tons of replay value, due to built-in and custom scenarios. |
| Cons: | Big or complicated maps slow it down; crashes sometimes. |
| Company's estimated price: | $40 |
| OS compatibility: | Mac OS 8.6 or later, including OS X |
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*Requires The Sims to play.

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iewed from the perspective of film photography, digital cameras can seem downright miraculous. More computer than camera, they let you not only take pictures but also preview them on the spot, delete your flubs, and even capture short movies. When combined with a Mac and a color printer, these cameras bring capture, development, image correction, and printing under one roof—and the entire process often takes less time than you'd wait to get a single roll of film developed at the local drugstore.

But to deliver this speed and flexibility, digital cameras require considerable money, attention, and technical know-how from their users. The fact is, digital cameras aren't for everyone. And with camera technology changing faster than the click of a shutter, even those who feel at home in a digital darkroom can have trouble keeping track of the latest trends and models.

That's why Macworld put together this Ultimate Buyers' Guide, looking not only at how to buy a digital camera but also at whether you should buy one at all. We began by gathering 26 of the newest digital cameras available and dividing them into three categories, according to how many millions of pixels (referred to as megapixels) they deliver. The roster includes one-megapixel cameras priced below $600, two-megapixel cameras priced below $800, and three-megapixel cameras that cost no more than $1,000. We then weighed test results and reviewers' experiences to determine the best camera in each group (see "The Power of Simplicity," "The Perfect Compromise," and "Photography at Its Best"). But knowing which cameras are our favorites doesn't help you answer a more fundamental question: Do you need one in the first place? Before you pull out your credit card, decide whether digital is really for you—and if it is, learn how to pick the digital camera that best suits the way you work and live.

BY DEKE MCCLELLAND
With a digital camera, you know you’ll end up with the image you want. If you’re using film, you may not discover your blunders until it’s too late.

Film versus Digital
I recently loaned one of my digital cameras to a photographer friend wise in the ways of film but relatively new to digital photography. I explained to him that rather than taking a Polaroid snapshot to judge a scene’s lighting and color before switching to his professional film camera (a common practice among studio photographers), he could use a single digital camera to take both the test shots and the final images. He was definitely intrigued.

But when he returned the camera a few weeks later, my friend seemed considerably sobered by the experience. Although he was pleased with the images, the process of downloading, editing, and archiving them had turned out to be more hassle than he’d bargained for. “I thought I was going to go nuts trying to make it all work!” he told me.

A camera that does everything may well require more effort than you expect—or want—to expend. What may seem like a blessing to some people—for example, having the ability to fine-tune images to perfection—can seem like a burden to those less patient. So is a digital camera the right tool for you? Here are the main arguments for and against making the switch to digital photography.

Image Quality One of the most hotly contested issues among film proponents and their digital counterparts is image quality. Film produces very high resolutions, which result in crisp, finely detailed images. While it’s impossible to accurately compare film and digital resolutions, conventional wisdom in the camera industry is that 35mm film can render an image in around six million pixels. If that’s true, then even the best of the cameras we looked at are only half as detailed. And professional film provides even higher resolutions, widening the gap.

However, to most folks, such comparisons are meaningless. Resolution currently favors film, but not to the extent that the numbers suggest. Depending on the film standard and quality, actual resolutions can be much lower than six million pixels. And as the image sensors on digital cameras improve, the discrepancy in image quality will continue to shrink. In fact, six-megapixel cameras such as the $7,000 Kodak Professional DCS 760 (www.macworld.com/2001/10/reviews/profdigcams.html) are already on the market.

Beyond the issue of resolution, however, film brings other unknowns to the image-quality equation. For example, film quality may degrade over time, depending on storage conditions—enough to cause variations even from shot to shot. With a digital camera, though, you know exactly what you’re working with: the image sensor captures one image after another, consistently and reliably. And if digital photos are properly archived and maintained, they can last indefinitely without any quality loss. (It’s a good idea to archive your digital images to fresh media every ten years or so to avoid losing your photographs to corrupted or outdated discs.)

Freedom to Experiment Resolution plays an important role in determining image quality, but it’s not the only consideration. The factor that truly tips the debate in favor of digital is natural selection: if you want the perfect picture of your niece’s wedding, for example, you’re likelier to get it with a digital camera because you’ll probably shoot more photos.

With a film camera, most people take one or two pictures of a scene and then move on. You can’t expend too many frames on any one scene because you might run out of film—and every shot costs money. But digital photography is considerably more cost efficient. After the initial expense of a camera’s media card, which stores images (see “Sizing Up Your Digital Media”), and batteries (many of the cameras we tested come with rechargeable batteries), individual digital photos are almost free. This means you can afford to take ten or twenty shots of each scene, trying out different options and angles until all of your photo’s elements are just right.

And since digital cameras let you immediately review your shots and delete bad ones, you don’t have to waste storage space on images you know won’t work—such as those capturing untimely blinks or unexpected movements. With a digital camera, you’ll know you have the image you want. If you’re using film, you may not discover a blunder until the prints are finished—and at that
point, it's far too late to do anything about it.

**Creative Control** Digital cameras also give you more control over your images. Once you have the image you want, you can promptly download it to your Mac, open it in your favorite image-editing program, and tweak it to perfection—cropping, correcting, and retouching. Then, armed with a photo-quality printer, you can output an image that looks even sharper and more vivid than a photographic print.

Of course, this level of control comes at a cost: most notably, your time and energy. Depending on your proficiency with image-editing software and the amount of correction necessary, a single digital image can take you upwards of 20 minutes to perfect. If you're not comfortable with image-editing software, or if you simply don't have the time—or patience—to bother with it, you may find this a bigger commitment than you're willing to make.

Busy digital-camera owners can get commercial prints of their digital photos by uploading them to a photo-printing Web site, but this can be costly, and it requires waiting for photos to arrive by mail.

For all the touted speed and convenience of digital cameras, film still takes less effort in the long run. You simply shoot your pictures, drop the film off at a drugstore, and pick up the prints a few days—or even an hour—later. You don't have as much control over the quality of the final image, but if perfection isn't something you aspire to, that may be a fair trade-off.

**Cost** Switching from film photography to digital will cost you more than time; it will also make a considerable dent in your wallet. A digital camera is a powerful device, but it can't edit, print, or archive photos; all of that requires extra hardware (see "The Price of Digital"). The cost of setting up a digital darkroom from scratch can range anywhere from...
THE POWER OF SIMPLICITY

THERE’S NOTHING LIKE collecting candid snapshots as keepsakes. But chances are, several shots on each roll of film you shoot aren’t worth a second glance. By switching to a digital camera, you can avoid wasting money on marginal prints and be sure you have the images you want. If you need prints no larger than five by seven inches, or if you plan to use your images for a Web site, a one-megapixel digital camera can deliver the pictures you want at a reasonable price.

Macworld Lab tested five one-megapixel digital cameras priced from $199 to $600 (see "26 Digital Cameras Compared"). After comparing features and evaluating each camera’s image quality, we determined that the $349 Canon PowerShot A10 offered the best combination of performance and value.

Feature Count
Since you can’t always control your shooting conditions, you want a camera with the flexibility to adapt to a variety of situations. Each of the cameras we looked at was easy to use, but some were better-equipped than others to face the unknown. The two Sony cameras—the Cyber-shot DCS-P30 and Mavica MVC-FD92—provide the most options for shooting in unpredictable lighting; they alone include both spot metering (using a small portion of the frame to measure light reflecting off a subject) and multiple-exposure modes, for nighttime shooting and other difficult circumstances. (The Olympus Camedia D-370 offers spot metering but no multiple-exposure modes.) The Cyber-shot DCS-P30 also has ISO settings of 100, 200, and 400, so you can manually select the camera’s light sensitivity instead of relying on its autosensor.

To help you get great shots when you’re far from your subject, the Mavica MVC-FD92 offers an impressive 8x optical zoom. The Cyber-shot DSC-P30 and the PowerShot A10 both feature a more common 3x optical zoom. Neither the Olympus Camedia Brio D-100 nor the Camedia D-370 has an optical zoom; instead they have a marginally useful 2x digital zoom.

Both Sony cameras and the Camedia D-370 can also record short movies (in MPEG and QuickTime format, respectively). The Mavica MVC-FD92 can simultaneously record 15 seconds of audio and high-quality video. The length of a movie shot with the Cyber-shot DSC-P30 (video only) depends on the capacity of the media card. The PowerShot A10 and the Camedia D-370 have special modes for capturing panoramas.

Your Best Shot
Of course, the most important measure of any camera is the quality of its images. In our tests, we took both indoor and outdoor shots with each camera and then examined the results for color fidelity, contrast, and sharpness (see "One-Megapixel Match"). In the end, the PowerShot A10 performed best overall, delivering excellent images in a variety of lighting situations and showing no significant weaknesses.

Though it favored warm tones, the Camedia Brio D-100 was the clear color-fidelity winner. The PowerShot A10’s images were a bit too red but otherwise comparable to output from the Brio. The Camedia D-370 and both Sony cameras had trouble producing accurate blues. Some images from the Mavica MVC-FD92 showed a greenish cast. Oddly, this problem was worse when we used manual white-balance settings.

When it came to contrast, the Cyber-shot DSC-P30 offered the best balance of highlight and shadow detail, followed by the Camedia Brio D-100. Images from the Mavica MVC-FD92 appeared underexposed. The PowerShot A10 led the pack in sharpness, with clear, crisp images. Results from the Cyber-shot DSC-P30 weren’t far behind. Images from the Camedia D-370 were noticeably less distinct than the rest.

Left in the Dark
It’s often impossible to position your subjects in perfect lighting. In such cases, a camera’s built-in flash continues

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RATING Power Up In 30 Seconds Colo r Fide lil

Con tras I Sharpness Fill Flash

We took one Indoor i1nd one outdoor photo with each camera, using best-quality settings. In Adobe Photoshop 6.0.1, we printed the images on premium-quality photo paper from an Epson Stylus Photo 780 printer set at its highest resolution. For the outdoor shot, we photographed a person standing in shadow, with forced flash to test the camera's fill-flash ability. The indoor shot was of a still life in a light box set at 5,000 degrees Kelvin. We set the cameras to automatic white Point and turned off the flash. A panel of experts judged the results.—Macworld Lab testing by Jason Cox

helps to keep pictures from turning out too dark. We tested the fill flash of each camera by shooting subjects backlit by daylight. The PowerShot A10 captured the most eye-pleasing results. The Cyber-shot DSC-P30's fill flash was not quite as bright but produced attractive images. The remaining cameras' flashes weren't up to the task; images were unacceptably dark, and subjects were hard to see.

You may encounter other situations in which a flash is inappropriate and it makes sense instead to use the limited light available. Here, aperture size plays a big role. None of the cameras in this roundup has a truly versatile lens. Nevertheless, with a wider aperture of f2.8, the Mavica MVC-FD92 (in Twilight mode) and the PowerShot A10 both produced acceptably sharp images. The Camedia Brio D-100 and the Cyber-shot DSC-P30 also created sharp images, but photos taken with these cameras under incandescent lighting had a strong yellow cast. When set to Twilight mode, the Cyber-shot DSC-P30 couldn't compensate for low light, and like the Camedia D-370, it frequently produced blurred images.

What's on the Menu
Making the transition from film to digital photography doesn't have to be difficult. Four of the cameras we tested physically resemble their 35mm point-and-shoot counterparts. The Mavica MVC-FD92, however, is considerably larger and heavier than the others due to its built-in floppy drive.

All of the models are easy to use, with conveniently positioned controls and logical menus. With the PowerShot A10, you don't even have to scroll through menus to make adjustments for different lighting situations; you can directly access white-balance and exposure-compensation controls via a button on the back of the camera. All cameras in the group responded quickly to their controls. The exception was on the Mavica MVC-FD92: when you press its shutter button halfway down to set focus and exposure, the image on the LCD viewfinder freezes momentarily—a troublesome quirk if you're taking action shots.

The PowerShot A10 was the only camera to require special software for downloading images to your computer. All the other cameras mounted their media directly on the desktop when connected via USB. All of the cameras accept some type of removable storage card.

The Mavica MVC-FD92, in addition to accepting Sony's proprietary Memory Sticks, offers an alternative—and outdated—storage method: floppy disk. This feature will be useful only to people with older computers or external floppy drives. Unfortunately, Sony includes neither a floppy disk nor a Memory Stick with the MVC-FD92. Likewise, the Camedia D-370 ships with no card for its SmartMedia slot, although it has 2MB of internal memory.

Macworld's Buying Advice
If you want a one-megapixel camera that can do a little of everything, the $300 Sony Cyber-shot DSC-P30 may be right for you. It produces acceptable images, captures short movies, and comes loaded with extra features. But if image quality is a top concern, the $349 Canon PowerShot A10 is worth the extra money. At a moderate price, it delivers excellent image quality and an attractive combination of features.—BONNIE HUIE

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EDITORS' CHOICE

## 26 DIGITAL CAMERAS COMPARED

### ONE-MEGAPIXEL CAMERAS

<table>
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<th>COMPANY</th>
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<th>DIMENSIONS (IN INCHES, W x H x D)</th>
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<th>OPTICAL ZOOM/ DIGITAL ZOOM</th>
<th>SPOT METERING</th>
<th>FOCAL LENGTH (35MM EQUIVALENT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canon</td>
<td>PowerShot A10</td>
<td>★★★★½</td>
<td>$349</td>
<td>800/652-2666, <a href="http://www.usa.canon.com">www.usa.canon.com</a></td>
<td>1.3</td>
<td>4.3 x 2.8 x 1.5</td>
<td>9.3</td>
<td>3x/6x</td>
<td>no</td>
<td>35mm-105mm</td>
</tr>
<tr>
<td>Olympus</td>
<td>Camedia Brio D-100</td>
<td>★★★★</td>
<td>$299</td>
<td>800/622-6372, <a href="http://www.olympusamerica.com">www.olympusamerica.com</a></td>
<td>1.3</td>
<td>4.3 x 2.4 x 1.3</td>
<td>6.5</td>
<td>none/2x</td>
<td>no</td>
<td>35mm</td>
</tr>
<tr>
<td>Olympus</td>
<td>Camedia D-370</td>
<td>★★★★</td>
<td>$199</td>
<td>800/622-6372, <a href="http://www.olympusamerica.com">www.olympusamerica.com</a></td>
<td>1.3</td>
<td>4.8 x 2.6 x 1.8</td>
<td>8.4</td>
<td>none/2x</td>
<td>yes</td>
<td>35mm</td>
</tr>
<tr>
<td>Sony</td>
<td>Cyber-shot DSC-P90</td>
<td>★★★★</td>
<td>$300</td>
<td>800/222-7669, <a href="http://www.sonystyle.com">www.sonystyle.com</a></td>
<td>1.3</td>
<td>4.9 x 2.6 x 2.6</td>
<td>9.4</td>
<td>3x/6x</td>
<td>yes</td>
<td>36mm-110mm</td>
</tr>
<tr>
<td>Ricoh</td>
<td>Mavica MVC-TD92</td>
<td>★★★½</td>
<td>$600</td>
<td>800/222-7669, <a href="http://www.sonystyle.com">www.sonystyle.com</a></td>
<td>1.3</td>
<td>5.6 x 4.1 x 3.1</td>
<td>22.5</td>
<td>8x/16x</td>
<td>yes</td>
<td>41mm-328mm</td>
</tr>
</tbody>
</table>

### TWO-MEGAPIXEL CAMERAS

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>PRODUCT</th>
<th>MOUSE RATING</th>
<th>COMPANY'S ESTIMATED PRICE</th>
<th>CONTACT</th>
<th>CCD RESOLUTION (IN MEGAPIXELS)</th>
<th>DIMENSIONS (IN INCHES, W x H x D)</th>
<th>WEIGHT WITH BATTERIES (IN OUNCES)</th>
<th>OPTICAL ZOOM/ DIGITAL ZOOM</th>
<th>SPOT METERING</th>
<th>FOCAL LENGTH (35MM EQUIVALENT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canon</td>
<td>PowerShot S10 Digital Elph</td>
<td>★★★½</td>
<td>$499</td>
<td>800/652-2666, <a href="http://www.usa.canon.com">www.usa.canon.com</a></td>
<td>2.1</td>
<td>4.5 x 3.0 x 2.0</td>
<td>12.4</td>
<td>3x/2.5x</td>
<td>no</td>
<td>35mm-105mm</td>
</tr>
<tr>
<td>Canon</td>
<td>PowerShot S300 Digital Elph</td>
<td>★★★★</td>
<td>$599</td>
<td>800/652-2666, <a href="http://www.usa.canon.com">www.usa.canon.com</a></td>
<td>2.1</td>
<td>4.0 x 2.5 x 1.5</td>
<td>9.7</td>
<td>3x/2.5x</td>
<td>no</td>
<td>35mm-105mm</td>
</tr>
<tr>
<td>Kodak</td>
<td>DX3500</td>
<td>★★★★</td>
<td>$299</td>
<td>800/235-6325, <a href="http://www.kodak.com">www.kodak.com</a></td>
<td>2.2</td>
<td>5.0 x 3.0 x 2.0</td>
<td>8.9</td>
<td>none/3x</td>
<td>no</td>
<td>38mm</td>
</tr>
<tr>
<td>Nikon</td>
<td>Coolpix 775</td>
<td>★★★★</td>
<td>$450</td>
<td>800/645-6687, <a href="http://www.nikonusa.com">www.nikonusa.com</a></td>
<td>2.1</td>
<td>3.4 x 2.6 x 1.7</td>
<td>7.0</td>
<td>3x/2.5x</td>
<td>no</td>
<td>38mm-115mm</td>
</tr>
<tr>
<td>Olympus</td>
<td>Camedia D-510 Zoom</td>
<td>★★★★½</td>
<td>$399</td>
<td>800/622-6372, <a href="http://www.olympusamerica.com">www.olympusamerica.com</a></td>
<td>2.1</td>
<td>4.8 x 2.7 x 2.0</td>
<td>11.7</td>
<td>3x/3.3x</td>
<td>yes</td>
<td>35mm-105mm</td>
</tr>
<tr>
<td>Samsung</td>
<td>Digimax 210SE</td>
<td>★★★★</td>
<td>$695</td>
<td>800/993-4110, <a href="http://www.samsung.com">www.samsung.com</a></td>
<td>2.1</td>
<td>4.5 x 2.7 x 2.2</td>
<td>12.7</td>
<td>3x/2x</td>
<td>no</td>
<td>38mm-114mm</td>
</tr>
<tr>
<td>Toshiba</td>
<td>PDR-M61</td>
<td>★★★½</td>
<td>$399</td>
<td>888/241-5874, <a href="http://www.toshiba.com">www.toshiba.com</a></td>
<td>2.3</td>
<td>4.7 x 3.2 x 2.5</td>
<td>14.1</td>
<td>3x/2x</td>
<td>no</td>
<td>38mm-114mm</td>
</tr>
</tbody>
</table>

### THREE-MEGAPIXEL CAMERAS

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>PRODUCT</th>
<th>MOUSE RATING</th>
<th>COMPANY'S ESTIMATED PRICE</th>
<th>CONTACT</th>
<th>CCD RESOLUTION (IN MEGAPIXELS)</th>
<th>DIMENSIONS (IN INCHES, W x H x D)</th>
<th>WEIGHT WITH BATTERIES (IN OUNCES)</th>
<th>OPTICAL ZOOM/ DIGITAL ZOOM</th>
<th>SPOT METERING</th>
<th>FOCAL LENGTH (35MM EQUIVALENT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canon</td>
<td>PowerShot G1</td>
<td>★★★½</td>
<td>$799</td>
<td>800/652-2666, <a href="http://www.usa.canon.com">www.usa.canon.com</a></td>
<td>3.3</td>
<td>5.0 x 3.2 x 2.7</td>
<td>15.4</td>
<td>3x/4x</td>
<td>yes</td>
<td>34mm-102mm</td>
</tr>
<tr>
<td>Casio</td>
<td>GZ-3500EX</td>
<td>★★★½</td>
<td>$599</td>
<td>800/836-8580, <a href="http://www.casio.com">www.casio.com</a></td>
<td>3.3</td>
<td>5.5 x 3.2 x 3.7</td>
<td>12.3</td>
<td>3x/4x</td>
<td>yes</td>
<td>33mm-100mm</td>
</tr>
<tr>
<td>Epson</td>
<td>PhotoPC 3100Z</td>
<td>★★★★</td>
<td>$799</td>
<td>800/463-7766, <a href="http://www.epson.com">www.epson.com</a></td>
<td>3.3</td>
<td>4.3 x 3.5 x 2.8</td>
<td>13.2</td>
<td>3x/2x</td>
<td>yes</td>
<td>34mm-102mm</td>
</tr>
<tr>
<td>Fuji</td>
<td>FinePix 6800 Zoom</td>
<td>★★★★½</td>
<td>$899</td>
<td>800/800-3854, <a href="http://www.fujifilm.com">www.fujifilm.com</a></td>
<td>3.3</td>
<td>3.8 x 3.2 x 1.5</td>
<td>9.6</td>
<td>3x/4.4x</td>
<td>yes</td>
<td>36mm-108mm</td>
</tr>
<tr>
<td>Kodak</td>
<td>DC4800 Zoom</td>
<td>★★★½</td>
<td>$599</td>
<td>800/235-6325, <a href="http://www.kodak.com">www.kodak.com</a></td>
<td>3.3</td>
<td>5.2 x 3.0 x 2.8</td>
<td>12.3</td>
<td>3x/2x</td>
<td>yes</td>
<td>28mm-84mm</td>
</tr>
<tr>
<td>Kyocera</td>
<td>Finecam S3</td>
<td>★★★★½</td>
<td>$699</td>
<td>732/560-0060, <a href="http://www.kyocera.com">www.kyocera.com</a></td>
<td>3.3</td>
<td>3.5 x 2.2 x 1.5</td>
<td>7.2</td>
<td>2x/2x</td>
<td>yes</td>
<td>38mm-76mm</td>
</tr>
<tr>
<td>Olympus</td>
<td>Camedia C-3040 Zoom</td>
<td>★★★★</td>
<td>$999</td>
<td>800/622-6372, <a href="http://www.olympusamerica.com">www.olympusamerica.com</a></td>
<td>3.3</td>
<td>4.5 x 3.0 x 2.5</td>
<td>13.3</td>
<td>3x/2.5x</td>
<td>yes</td>
<td>32mm-96mm</td>
</tr>
<tr>
<td>Ricoh</td>
<td>RDC-7</td>
<td>★★★★</td>
<td>$799</td>
<td>800/459-3968, <a href="http://www.ricohzone.com">www.ricohzone.com</a></td>
<td>3.3</td>
<td>5.3 x 2.9 x 1.1</td>
<td>10.2</td>
<td>3x/3.2x</td>
<td>no</td>
<td>35mm-105mm</td>
</tr>
<tr>
<td>Sony</td>
<td>Mavica MVC-CD300</td>
<td>★½</td>
<td>$1,000</td>
<td>800/222-7669, <a href="http://www.sonystyle.com">www.sonystyle.com</a></td>
<td>3.3</td>
<td>5.5 x 3.7 x 4.0</td>
<td>23.1</td>
<td>3x/6x</td>
<td>yes</td>
<td>34mm-102mm</td>
</tr>
<tr>
<td>Toshiba</td>
<td>PDR-M65</td>
<td>★★★★</td>
<td>$499</td>
<td>800/526-0266, <a href="http://www.toshiba.com">www.toshiba.com</a></td>
<td>3.3</td>
<td>4.8 x 2.9 x 2.4</td>
<td>11.4</td>
<td>3x/2x</td>
<td>no</td>
<td>38mm-114mm</td>
</tr>
</tbody>
</table>

★ *Editors' Choice. *N/A = not applicable. This camera ships with one mini-CD for recording images.
<table>
<thead>
<tr>
<th>FLASH OPTIONS</th>
<th>ISO OPTIONS</th>
<th>DEFAULT MEMORY</th>
<th>MEDIA FORMAT</th>
<th>RECHARGEABLE BATTERIES AND CHARGER INCLUDED?</th>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto, red-eye, off</td>
<td>100</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Very sharp images; good color fidelity.</td>
<td>No movie-capture mode.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, slow synchronization, off</td>
<td>Auto</td>
<td>8MB</td>
<td>SmartMedia</td>
<td>no</td>
<td>Excellent color fidelity; compact size.</td>
<td>No optical zoom; weak flash.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, slow synchronization, SR, off</td>
<td>Auto</td>
<td>2MB</td>
<td>SmartMedia</td>
<td>no</td>
<td>Inexpensive; spot metering; good battery life.</td>
<td>Images are not sharp; weak flash; SmartMedia not included.</td>
</tr>
<tr>
<td>Auto, fill, off</td>
<td>Auto, 100, 200, 400</td>
<td>4MB</td>
<td>Memory Stick</td>
<td>no</td>
<td>Sharp images; multiple-exposure mode; spot metering.</td>
<td>Includes only 4MB of storage; poor color fidelity.</td>
</tr>
<tr>
<td>Auto, red-eye, off</td>
<td>100</td>
<td>none</td>
<td>Memory Stick, 1.44MB floppy disk</td>
<td>yes</td>
<td>Powerful zoom; multiple-exposure mode; spot metering; battery charges inside camera.</td>
<td>Memory Stick not included; PC-formatted floppy drive; bulky; weak flash.</td>
</tr>
<tr>
<td>Auto, on, red-eye, off</td>
<td>100</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Good image quality; good fit in hand; inexpensive.</td>
<td>Weak flash.</td>
</tr>
<tr>
<td>Auto, on, red-eye, slow synchronization, off</td>
<td>100</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Compact; lightweight; low digital noise; good image quality.</td>
<td>Proprietary battery—need more than one for trips.</td>
</tr>
<tr>
<td>Auto, on, red-eye, slow synchronization, off</td>
<td>100</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Compact; lightweight; good image quality.</td>
<td>Proprietary battery—need more than one for trips.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, off</td>
<td>100, 200</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Inexpensive; good flash; very good image quality; lightweight.</td>
<td>No display for camera information; no optical zoom; feels poorly made.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, off</td>
<td>100</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Durable; useful in harsh environments; good color.</td>
<td>Bulky; images lack sharpness and contrast.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, slow synchronization, off</td>
<td>100, 200</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>yes</td>
<td>Compact; lightweight; good image quality.</td>
<td>Small LCD; too many shooting modes.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, night scene, off</td>
<td>100, 200, 400</td>
<td>8MB</td>
<td>SmartMedia</td>
<td>no</td>
<td>Good fit in hand; inexpensive.</td>
<td>Poor image quality; noisy images.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, slow synchronization, off</td>
<td>100, 200, 400</td>
<td>8MB</td>
<td>SmartMedia</td>
<td>no</td>
<td>Good fit in hand; 10x zoom.</td>
<td>Very poor image quality; expensive.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, slow synchronization, off</td>
<td>100, 200, 400</td>
<td>8MB</td>
<td>SmartMedia</td>
<td>no</td>
<td>10x zoom; SLR form factor; good image quality.</td>
<td>Expensive; not very compact.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, off</td>
<td>100</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Good fit in hand.</td>
<td>Clumsy to turn on; very poor image quality; hard to navigate menus; expensive.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, off</td>
<td>100</td>
<td>8MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Inexpensive.</td>
<td>No hard-copy manuals; very poor image quality; feels poorly made.</td>
</tr>
<tr>
<td>Auto, red-eye, off</td>
<td>100, 200, 400</td>
<td>16MB</td>
<td>CompactFlash</td>
<td>yes</td>
<td>LCD screen pivots; battery charges inside camera.</td>
<td>Complex interface; poor flash; lens cap interferes with powering up camera.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, off</td>
<td>100, 180, 300, 500</td>
<td>16MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Loaded with extras, including menu of presets for various photographic and lighting situations.</td>
<td>Very poor image quality; can’t capture sound; presets too sweeping to be useful to beginners.</td>
</tr>
<tr>
<td>Auto, red-eye, slow synchronization, off</td>
<td>100, 200, 400</td>
<td>16MB</td>
<td>CompactFlash</td>
<td>no</td>
<td>Good image quality; straightforward menu system; includes lens adapter and case; excellent documentation.</td>
<td>Lacks rechargeable batteries; relatively few manual-focus increments.</td>
</tr>
<tr>
<td>Auto, on, red-eye, slow synchronization, off</td>
<td>100, 200, 400</td>
<td>16MB</td>
<td>SmartMedia</td>
<td>yes</td>
<td>First-rate image quality; superior upsampling; straightforward controls; battery charges inside camera; automatic lens cover.</td>
<td>No panoramic option; video limited to 10 frames per second.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, strobe, off</td>
<td>100, 200, 400</td>
<td>16MB</td>
<td>CompactFlash</td>
<td>yes</td>
<td>First-rate image quality; straightforward controls and menu; battery charges inside camera.</td>
<td>No manual focus; lacks audio, video, and panoramic functions; no lens cap.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, off</td>
<td>100, 200, 400</td>
<td>16MB</td>
<td>SD card</td>
<td>yes</td>
<td>Very compact; includes media card reader; battery charges inside camera; easy to use.</td>
<td>Relatively few manual-focus increments; lacks audio, video, and panoramic functions.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, slow synchronization, off</td>
<td>Auto, 100, 200, 400</td>
<td>16MB</td>
<td>SmartMedia</td>
<td>no</td>
<td>Straightforward menu system; best panoramic feature in group.</td>
<td>Lacks rechargeable batteries; tends to blow out highlights in skies; lens cap interferes with powering up camera.</td>
</tr>
<tr>
<td>Auto, on, red-eye, slow synchronization, off</td>
<td>100, 200, 400</td>
<td>8MB</td>
<td>SmartMedia</td>
<td>yes</td>
<td>LCD screen pivots; special mode merges two photos to produce one higher-resolution image (still subjects only).</td>
<td>Middling image quality; awkwardly positioned lens with no cap.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, off</td>
<td>Auto, 100, 200, 400</td>
<td>N/A</td>
<td>Mini-CD</td>
<td>yes</td>
<td>Good image quality; battery charges inside camera.</td>
<td>Large; expensive; no manual focus; uses bulky, slow, and labor-intensive mini-CDS.</td>
</tr>
<tr>
<td>Auto, fill, red-eye, slow synchronization, off</td>
<td>100, 200, 400</td>
<td>8MB</td>
<td>SmartMedia</td>
<td>no</td>
<td>Least expensive camera in group; automatic lens cover.</td>
<td>Blue cast to images; clunky design; no manual focus or rechargeable batteries; lacks audio, video, and panoramic functions.</td>
</tr>
</tbody>
</table>
Three-megapixel images take up more room in your computer's memory, more space on your hard drive, and more of your time to edit and print.

$2,600 at the low end—about what you’d spend on a first-rate 35mm film camera and on your first 200 rolls of film—to $6,500 at the high end.

If that sounds shockingly steep, bear in mind that these numbers are for people starting with nothing. If you already own a few of the basics—a USB-enabled computer, a decent inkjet printer, and a CD-R drive, for starters—then your digital darkroom could cost you no more than a few hundred dollars, depending on the camera you choose. (The cameras we looked at are priced from $199 to $1,000.) This may still be more than you’d spend on a point-and-shoot film camera, but if you use your digital camera regularly, the money you save on film and processing can quickly make up the difference.

Of course, if you’ve invested in film-camera accessories such as wide-angle and telephoto lenses, keep in mind that these add-ons won’t be compatible with most digital cameras on the market. Although a few top-of-the-line digital cameras—such as the Epson PhotoPC 3100Zoom—include lens adapters, most digital cameras are essentially point-and-shoot devices. This could frustrate photographers accustomed to the relative flexibility of most high-end film cameras.

Making the Choice So what’s the verdict? If you’re the least bit shy of technology, or if you don’t have a lot of time to spare, you may be happier sticking with film. On the other hand, if you enjoy spending time working at your Mac, or if you’re dissatisfied with your film results and think you can do better, you’ll probably take to digital like an otter to water.

Counting Your Pixels
If you decide to move to digital photography, your first task will be deciding just how much power you need in a camera. Digital cameras have many different shapes, prices, and feature sets, but the most important variance is the size of the images they record. A digital camera’s resolution is measured in the number of pixels—the tiny dots of color that form a digital image—its CCD captures (the CCD, or charge-coupled device, is the digital equivalent of film). Four years ago, the top digital cameras boasted a measly three hundred thousand pixels. Cameras today capture at least one megapixel, and many grab more than three.

Digital-imaging aesthetes will tell you that, where pixels are concerned, there’s no such thing as enough. To an extent they’re right: pixels lend detail and definition to a photograph. Imagine a homeroom photo of 30 or 40 kids. If a camera rendered that photo using a hundred pixels, each kid would get about three pixels. You’d have a hard time recognizing the kids as human beings, let alone picking your child out of the crowd. But ratchet up the pixel count to a few million, and you can make out a freckle on your daughter’s nose (see “What a Difference a Pixel Makes”). Naturally, high pixel counts have disadvantages, the first and most obvious of which is price. A top-of-the-line three-megapixel camera costs, on average, twice what its one-megapixel counterpart does. But the pocketbook isn’t the only thing affected. The abundance of pixels that is so essential for good image quality...
It's clear that pixels are valuable—after all, a three-megapixel camera can cost two or three times as much as a one-megapixel device. But why? Pixels (the word is short for picture element) are the tiny dots that make up a digital image. The more pixels a camera uses to reproduce an image, the more detailed that image will be. To show you how pixel numbers affect the quality of digital photographs, we shot a scene three times—with one-, two-, and three-megapixel cameras. We then printed each photograph at eight by ten inches with a resolution of 300 pixels per inch. Notice that the small sample from the one-megapixel image (left) appears blocky and blurred, while the three-megapixel image (right) is sharp and highly detailed.

Also burdens your Mac. While the size of high-quality images from our one-megapixel cameras averaged about 500K, the best images from the three-megapixel cameras we tested averaged more than 1.5MB—and that’s for a compressed image. (When you open a three-megapixel image in Adobe Photoshop, it grows to 9MB!) Three-megapixel images take up more room in your computer’s memory, more space on your hard drive, and more of your time to edit and print.

They also cost more to archive. The first CD archive of digital photos I ever burned contained more than 3,000 photos captured over three years. The CD I burned last week held fewer than 400 images captured over just seven weeks. If this trend continues, I’ll soon be churning out CDs as if they were 400K floppies.

The lesson, then, is to purchase a camera with as few pixels as you reasonably need. If your sole intention is to post images on the Web, then a one-megapixel camera will serve you well. A typical Web photo measures 300 by 400 pixels, a scant 10 percent of the detail a one-megapixel camera delivers. If you intend to print your images, however, higher resolutions may be in order. For smooth, crisp photos, you should print your images at between 150 and 300 pixels per inch. This means that a one-megapixel image looks great when it’s printed at three by four inches, but it may begin to lose definition and clarity when it’s bumped up to five by seven inches. A three-megapixel image, on the other hand, prints crystal clear at five by seven inches, and you can even enlarge it to a full nine by twelve inches.

Now, you might ask why, if a one-megapixel image can produce images of
THE PERFECT COMPROMISE

Despite the introduction of three-megapixel cameras last year, two-megapixel models remain the most popular type of digital camera on the market. Two-megapixel cameras offer an attractive combination of price and performance: they’re more powerful than the modest one-megapixel cameras yet more affordable than their full-featured three-megapixel counterparts. We looked at eleven recently released two-megapixel cameras priced from $299 to $799 (see “26 Digital Cameras Compared”). After putting them through their paces, we determined that the $499 Canon PowerShot S110 Digital Elph clearly stood out from the competition in value, quality, and style.

The Works
While all the cameras we tested offer a variety of special features, the Olympus Camedia C-2100 Ultra-Zoom is the richest of our two-megapixel digital cameras, sporting an image-stabilization system to reduce blur in close-up shots, and a range of ISO settings for different lighting conditions. To get great close-ups, you need an optical zoom. Both the Olympus Camedia C-700 UltraZoom and the Camedia C-2100 Ultra-Zoom sport an impressive 10× optical zoom. The other cameras feature the more standard 2× or 3×. The Kodak DX3500 alone lacks an optical zoom, offering instead a less useful 3× digital zoom. The digital-zoom feature on all three Camedia models in this roundup is seamless: the camera automatically switches to digital zoom when the limit of its optical range is reached. This can be annoying if you don’t want to use the digital zoom.

In light sensitivity, the three Camedias are the clear winners, offering a choice of 100, 200, and 400 ISO settings. The DX3500 and the Nikon Coolpix 775 offer ISO settings as high as 200, while the rest of the cameras offer only 100.

Five of the cameras—the Olympus Camedia D-510 Zoom, C-700 UltraZoom, and C-2100 Ultra-Zoom, and the Canon PowerShot S300 Digital Elph and S110 Digital Elph—offer an additional option: the ability to record QuickTime movies with sound. These two PowerShots can even play back the recorded video on their LCD screens.

Seeing Is Believing
After checking out their features, we turned our eye to how well these two-megapixel models performed their most crucial task: taking pictures. In a series of subjective tests evaluating image and flash quality, we found that the highest overall performance came from the DX3500, the PowerShot S110 Digital Elph, and the Camedia C-2100 UltraZoom.

The Samsung Digimax 210SE, Toshiba PDR-M61, and Camedia C-700 UltraZoom scored lowest in our photo tests. The images they produced lacked color fidelity, and they suffered from an excess of digital noise, giving solid areas of color a blotchy, uneven appearance. None of the cameras in the group produced truly sharp images, but those from the Kodak DC5000 Zoom, the Camedia C-700 UltraZoom, and the Digimax 210SE were noticeably the softest. Although the PowerShot S110 Digital Elph didn’t receive outstanding scores in any individual test category, it consistently produced attractive images with less digital noise than the other cameras recorded.

When we used a flash to photograph a subject backlit by bright sunlight, only two of the cameras—the Camedia C-2100 UltraZoom and the DX3500—produced well-lit, attractive images. The Canon PowerShot A20 and the PDR-M61, by contrast, had poor fill flash, resulting in overly dark pictures.

Fitting In
With cameras, size does count. All of the models we looked at are relatively compact and easy to carry, with one notable exception: the DC5000 Zoom, which is significantly larger than any other camera in this roundup. Designed for outdoor use, all of the DC5000’s controls have latches or switches that you can manipulate with gloved hands. Most of the cam-
era's body is rubberized to make it weatherproof, and it's suited for use aboard ships and around heavy machinery, dust, and grit.

Although not as bulky as the DC5000, the Camedia C-2100 UltraZoom is heavier than the other digital cameras; however, it still fits well in the hand. The smallest cameras of the group—the Coolpix 775 and the PowerShot S110 Digital Elph and S300 Digital Elph—are roughly the size of a credit card, with the thickness of two decks of cards. The Coolpix 775 is also the lightest, weighing seven ounces (with its batteries).

Easy Does It

Picture-perfect moments sometimes come without much warning, so if your camera isn’t easy to use, you could miss a shot. One of the most useful features of a digital camera is its LCD screen. Most of the cameras in this group feature an LCD measuring 1.8 inches, but owing to the Coolpix 775’s compact size, its screen is smaller, at 1.5 inches. The Camedia C-2100 UltraZoom lacks a traditional optical viewfinder and instead relies entirely on its LCD screen to frame shots. Unfortunately, the LCD is less responsive than an optical viewfinder and does not work as well in low light.

Maneuvering through the LCD’s screen menus was difficult on two of the cameras. The icons in the DC5000 Zoom’s LCD display were confusing; we had to look them up in the user manual. And the Digimax 210SE’s LCD employs a file-folder interface for menu-system navigation. Moving through its folders and menus proved cumbersome, and the navigation buttons were too small and difficult to press. Plus, to select a flash mode, you must navigate a second set of buttons on top of the camera, a time-consuming process. We also had a problem with the power button on the back of the Digimax 210SE; it took us multiple attempts to turn the camera on, even with fresh batteries.

Macworld’s Buying Advice

Although many of the two-megapixel cameras in this group would make solid choices, a few stand out. One of the costliest models we looked at, the $799 Olympus Camedia C-2100 by far the richest in features, with one of the most powerful zooms available. If you can’t spend a lot and don’t need a zoom, the $299 Kodak DX3500 offers sharp, attractive images at a price that’s hard to beat. But the most appealing camera in this group is the incredibly compact $499 Canon PowerShot S110 Digital Elph, which produces great images at a reasonable price.—RICK OLDANO
You can shop online, but unless you actually take the camera in hand, you won’t know whether it really performs well or fits the way you work.

If saving money and energy is more important to you than getting a great image, a one-megapixel camera is the ticket. If you want the freedom to crop, straighten, and edit images, but you don’t plan on printing many large photos, look for a two-megapixel model. And if you want all the flexibility money can buy, along with the ability to print large-format images, splurge on a three-megapixel model.

Picking the Best Camera

Once you’ve established the number of pixels you need, it’s time to start looking for the camera that meets your specific needs. Even among cameras in the same pixel category, features and quality levels can vary tremendously. So how do you find a camera that brings it all together? While we highly recommend our Editors’ Choices—each one is a bona fide champ—we realize that they may not suit the needs of every photographer. Furthermore, technology has a habit of turning over more often than a rotisserie chicken; the cameras we recommend today may be gone tomorrow.

You can shop online until pictures and specifications are permanently imprinted on your retinas. But if you don’t actually take the camera in your hands and put it through its paces, you won’t know whether it really performs well or fits the way you work. Based on my years of experience with digital cameras, the nine steps I take to evaluate every new model are as follows.

1. Turn It On

Make sure the camera is easy to power up. Note how long the process takes—you don’t want to miss a good picture because you’re waiting for your camera to turn on or because you have to wade through a series of on-screen questions before you can use it. Also check that the lens extends successfully and doesn’t get stuck if the cap is accidentally left on.

2. Set the Time

All cameras have a time function to indicate when you shot each picture. Try setting the time and date. This will give you a feel for the camera’s menu system—whether it’s easy to use or sends you scurrying for the manual.

3. Turn On the LCD

Check that the LCD preview screen lights up automatically when you turn on the camera, or that the display button is easy to find—you don’t want to hunt around for a button when you’re ready to start shooting. Watch the screen as you move the camera around. The LCD screen should provide a continuous view of the world around you. Avoid cameras with LCD images that appear grainy and jerky—they’ll make it hard to frame your shots correctly. If the LCD is filled with scads of technical data, make sure you can hide it for a better view of your picture.
THE TEST

All digital cameras are not created equal. They come in different sizes, with different menus, and with a mind-blowing variety of features. The most important difference, however—output quality—can also be the hardest to inspect while you’re standing in a camera store. That’s why, in addition to testing each of our digital cameras for speed and usability, Macworld Lab cast a critical eye on the pictures they produced. We started by taking several photographs—indoors and outdoors—with each camera. We then printed the best images from each model on an Epson Stylus Photo 780, with no image correction. A panel of experts judged the results’ sharpness, contrast, and color fidelity, as well as the quality of the flash lighting. Of course, everyone does not agree on what a perfect image looks like. In case you’d prefer to make up your own mind, we put test images from all of the cameras online (www.macworld.com/2001/11/features/cameras_bg.html). These are some of the things that we looked for:

4. Shoot a Few Pictures You should test the camera’s autofocus abilities. Take a few shots of a subject positioned against a cluttered background, and see whether the focus locks on the subject or drifts to other objects in the scene. Note how close to the subject you can get and still focus accurately. Many cameras include a macro button that you can use when your subject is less than a foot away.

While you’re taking pictures, make sure there’s no noticeable delay between when you press the shutter button and when the camera takes the picture—a lot can happen in a sec-

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PHOTOGRAPHY AT ITS BEST

SEVEN YEARS AGO, I began using digital cameras, and I haven't touched a roll of film since. Without film, after all, I never have to worry about development costs, and I can see my photos immediately. So it's a good thing my wife and I waited until last year to have our first child. Otherwise, the boy's formative years would have been immortalized in the grainy, indistinct, 640-by-480-pixel dreck of early digital cameras. Instead, our wise son waited until three-megapixel cameras came onto the scene; these cameras offer crisp, richly detailed, high-resolution photos we'll continue to treasure into our old age—assuming, of course, we can find our glasses.

Macworld Lab examined ten of the three-megapixel family's newest members, which range in price from $499 to $1,000 (see "26 Digital Cameras Compared"). Conspicuously absent from the group is any camera from the often-praised Nikon, which recalled a prerelease model of its Coolpix 995 before we could test it, citing technical problems. What remains is a collection of impressive high-resolution shooters—most of which outpace anything available two years ago—and one camera, the $899 Fuji FinePix 6800 Zoom, that outpaces the rest in performance and value.

The Right Tools
Photographs are a camera's only legacy. So it's refreshing to see these camera makers expend so much energy on the core task of picture-taking. A few years ago, a typical digital camera had a fixed lens, with no ability to change focus or zoom. Now, every three-megapixel camera we reviewed offers autofocus and an optical zoom—ranging from 2x in the Kyocera Finecam S3 to 3x for the others. All cameras except the Kodak DC4800 Zoom, Sony Mavica MVC-CD300, and Toshiba PDR-M65 permit you to adjust the focus manually. Sadly, not all do a wonderful job of it—the Epson PhotoPC 3100Z and Kyocera Finecam S3 force you to select from fixed settings—and none provides anything as practical as a manual focus ring.

Light sensitivity has also improved. The Casio QV-3500EX, in particular, boasts ISO ratings as high as 500 (the other cameras top out at 400). But don't expect your camera to always exploit the entire range. For example, on Canon's PowerShot G1, you can manually raise the ISO to 400, but when you're working in the Auto mode, it floats between 50 and 100—best suited to sunlight and flash.

Image Quality
Despite having three million pixels at their disposal, not all of these cameras shoot gorgeous pictures. Of the ten cameras, the real standouts in image quality were the PhotoPC 3100Z, FinePix 6800 Zoom, and DC4800 Zoom. All three delivered bright photographs with excellent detail in the highlights and shadows, particularly under controlled lighting. The FinePix 6800's images were the warmest, with rich reds and yellows. While I also liked the colors from the Olympus Camedia C-3040 Zoom, it had a tendency to blow out highlights, turning large portions of skies and other bright backgrounds to white space. The worst of the images came from the Toshiba PDR-M65 and Casio QV-3500EX cameras. The PDR-M65 produced distinctly blue images with muted contrast, while the QV-3500EX turned out photographs so dark that they looked as though they had been shot through a pair of sunglasses.

Design and Usability
A camera's physical design is almost as important as the quality of the images it produces. A prime example of camera design at its best is the Finecam S3. Slightly smaller than the standard Apple Pro Mouse, the Finecam S3 is the tiniest (though not the lightest) digital camera around. Its rechargeable battery—which is roughly the size of a thick stick of gum—not only is easy to load and unload, but also charges while inside the camera (as do those for
The PowerShot G1, FinePix 6800, and Mavica MVC-CD300. Best of all, its postage-stamp-size 16MB MultiMediaCard ships with its own reader—no software required. In contrast, most of the other cameras use CompactFlash or SmartMedia cards for which you have to purchase readers or, in many cases, install special driver software.

The PhotoPC 3100Z, DC4800 Zoom, and Camedia C-3400 Zoom get high marks for self-evident menu systems that let you change settings with a minimum of fuss. To gain an instant appreciation for old-fashioned simplicity and predictability, you need only spend a day with the PowerShot G1 and its 12-setting dial, or the PDR-M65, which flickers on and beeps every time you swap memory cards. The PowerShot G1 and the Ricoh RDC-7 sport detachable LCD previews, perfect for framing shots from awkward angles. If you're looking for the best combination of style and substance, however, train your eyes on the FinePix 6800 Zoom. Though nearly twice as large as the wee Finecam S3, the FinePix 6800 boasts a simpler menu system and a more fetching façade.

The worst of the bunch to work with is the Mavica MVC-CD300, which records images to miniature CD-Rs that are such a chore to manage, they make film look convenient. What should be a simple act of swapping a CD-R between the camera and your Mac involves installing a driver and a sequence of initialization, finalization, and unfinalization that's so complex, the manual includes a flowchart on the topic. And the Mavica's reliance on CDs makes it bulky and, on occasion, maddeningly slow.

Special Features
When you purchase an $800 device equipped with a complex circuit board, you have a right to assume it will do more than simply capture still images. Three cameras—the QV-3500EX, PhotoPC 3100Z, and Camedia C-3400 Zoom—offer built-in settings to help you turn multiple pictures into a seamless panorama by lining up the shots just right. But when the PhotoPC takes the shots, it doesn't lock down the exposure and white balance, which means one shot may not blend well with the next.

Those same three cameras—plus the PowerShot G1, FinePix 6800 Zoom, and RDC-7—also permit you to shoot QuickTime or AVI movies at 320 by 240 pixels. Most of these cameras record 15 frames per second; the FinePix 6800 lags with only 10. All capture sound with the movie except for the QV-3500EX which has no microphone.

Macworld's Buying Advice
Many of this roundup's cameras would make satisfying choices—particularly the $799 Epson PhotoPC 3100Z and the $599 Kodak DC4800 Zoom. But the $899 Fuji FinePix 6800 Zoom stood out from the rest for its top-notch picture quality and functionality. If your main concern is size, consider the tiny $699 Kyocera Finecam S3, which also has some excellent convenience options.—DEKE MCCLELLAND

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**Editors' Choice**

#### 4½ Fuji FinePix 6800 Zoom
This compact three-megapixel digital camera combines first-class picture quality with straightforward controls and a fun but functional collection of extras. **Company:** Fujifilm (800/800-3854, www.fujifilm.com) **Company's estimated price:** $899
Don't be swayed by high digital-zoom measurements. With digital zoom, the camera merely enlarges pixels without providing greater detail.

5. Test the Zoom  The process of extending the zoom lens should be smooth and effortless. Is it difficult for you to frame and zoom at the same time? In comparing cameras, don't be swayed by high digital-zoom measurements. A digital zoom isn't a true zoom; the camera merely enlarges the pixels of the image without providing greater detail. It's best to evaluate a camera by its optical-zoom measurement. And watch out for models that automatically switch from optical to digital zoom without warning you. On cameras with seamless zooming, check to see whether you can disable the digital zoom if you need to.

6. Use the Flash  An ideal flash powers up automatically in dim light; avoid cameras that make you turn on the flash. Check that the flash is mounted high above the lens element, for even lighting, not close and to the side, which can produce washed-out images. Can you easily turn on the flash to fill in a backlit subject? Does the flash evenly fill in shadows, or does it cast harsh, uneven lighting?

7. View Your Photos  After each shot, the camera should automatically preview your photo for a second or two. Following that, you should be able to review your pictures by switching to a play mode. Scroll back through the camera's stored images and see how easy it is to skip from one photo to another. Can you magnify a picture to take a closer look? Can you easily delete one or more photos without erasing them all? The camera should prudently confirm each deletion but not irritate you with warning after warning.

8. Transfer the Photos  If you're in a store that has a computer available, ask to copy pictures to it from the

SIZING UP YOUR DIGITAL MEDIA

A roll of film is measured by the number of pictures it holds, but a camera's digital media card is measured by the number of megabytes it holds. This is because the exact number of pictures that a digital camera can store varies according to the size and quality of those images. For example, an 8MB card might hold four images or forty-eight.

Since most cameras ship with only a minimum amount of storage—a few cameras we looked at didn't include any—you'll probably want to invest in one or two extra media cards up front. Therefore, it's a good idea when choosing a digital camera to consider what type of storage you're investing in, and whether it will continue to meet your needs down the road.

FLASH RAM  By far the most popular type of storage is Flash RAM. Like the RAM in your computer, Flash RAM is small, lightning fast, and highly stable (because it involves no moving parts). Flash RAM comes in several different styles, sizes, and storage capacities.

SmartMedia and CompactFlash  The two most common types of Flash RAM cards are Toshiba's SmartMedia and SanDisk's CompactFlash. Both are small—less than a quarter the size of a floppy disk—but SmartMedia is the thinner.

Both media formats are highly reliable, but CompactFlash has the edge. Because the contact area of a SmartMedia card is exposed, you may wipe out your stored images if you touch or rub this area. CompactFlash, on the other hand, is rock solid—I have stepped on a card without hurting data. CompactFlash also has the advantage in compatibility. SmartMedia has changed
camera, so you can inspect them in more detail. And if the store offers a printer, look at one or two images on paper. If it doesn’t, ask to copy the image files to a disk or e-mail them to yourself so you can print them on your home printer.

9. Check Out the Manual  Insist on a printed manual small enough to throw into a camera bag. If you’re lucky, the manual will include an index; the next best thing is an extensive table of contents. And read through a section and make sure the manual is intelligible and doesn’t read like a bad translation. Every camera has hidden features; only good documentation can bring them to light.

Worth the Effort  This may sound like a lot to go through while you’re standing in the middle of your local camera or computer store. But if it ends with you finding the camera you really want, it’ll be time well spent. Even if you plan to order your camera online, I recommend going to a store and physically holding the camera before you make your choice. A digital camera can be a considerable investment; you’ll want to know that your camera will deliver the results and performance you demand.

The Last Word  Many types of computer hardware are commodity products—that is, all the models are based on the same mechanics, so it really doesn’t matter which one you buy.

That’s not true of digital cameras, however. Two may share the same type of menu system, storage medium, and lens, but you can almost always find more differences than similarities between them. Each digital-camera model is, in most respects, a unique device with particular advantages and disadvantages. You can use the tips in this guide to help you identify your priorities in choosing a digital camera—and then, most importantly, you should shop around.

The bottom line is that you don’t have to settle for a digital camera that’s anything less than perfect for you. If you can identify a need and put it into words, you can almost certainly find a camera that more than meets that need.

DEKE McČLLAND is the author of the forthcoming Adobe Master Class: Designer Invitational (Peachpit Press, 2001) and host of the DVD series Total Training for Photoshop 6 (Total Training, 2001).

More Info: www.macworld.com/subject/cameras
Read digital-camera reviews and keep up to date on the latest news in digital photography.

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The highest-capacity SmartMedia cards can store as much as 128MB and sell for $150. CompactFlash cards come in various sizes; the largest holds 512MB and costs $500.

Memory Stick  SmartMedia and CompactFlash aren’t the only Flash RAM standards. About the size of a stick of gum, the Memory Stick is sold exclusively by Sony (800/222-7669, www.sonystyle.com). Consequently, Sony is the only vendor using the proprietary standard, so it’s not compatible with many popular digital photo printers, card readers, and other devices. The largest-capacity Memory Sticks hold 128MB and sell for $240—making them the costliest Flash RAM option.

MultiMediaCard  Another type of Flash RAM gaining momentum is the MultiMediaCard—which is called a Secure Digital (SD) card—which was developed by a consortium of high-tech vendors. This postage-stamp-size card makes SmartMedia look positively huge. And because it’s already an established standard among other electronic devices such as cell phones and modern PDAs, the MultiMediaCard is broadly compatible. Unfortunately, MultiMediaCards currently hold a maximum of only 64MB. They cost $80.

MICRODRIVE  It’s not truly a type of Flash RAM, but IBM’s Microdrive (800/426-4968, www.storage.ibm.com) is the same size as CompactFlash and works with some of the same cameras. Basically a small hard drive, the largest Microdrive, at $459, holds a whopping 1GB of data. None of the cameras that we reviewed ship with a Microdrive, but it’s a good solution for photographers who plan to take a lot of pictures between downloads.

TRADITIONAL MEDIA  Sony’s Mavica, the most popular digital-camera line ever, has been built around more-pedestrian media: first the floppy disk and now the 8mm CD-R. While these mini-CDs hold a large number of images for a very low cost (a 150MB re-writable disc costs a mere $10), they are several times larger and slower than Flash RAM media, and without a special adapter, it can’t be used with slot-loading drivers. The other disadvantage is that you have to install software and perform an additional operation to read a Mavica CD on a Mac.
Make AirPort Cross Platforms

BY CHRISTOPHER BREEN

Anyone who's had the opportunity to use AirPort understands that this form of wireless networking is one of the most elegant and exciting technologies to come from Apple in ages. With little more than two AirPort-equipped Macs, you can transfer files between computers in different rooms of your house and surf the Web from your back porch, without being constrained by wires.

But why should Mac users have all the fun? We're well aware that the world is full of PCs and that your wireless setup may include one. Maybe a misguided loved one, who refuses to abandon her laptop PC, would like to surf the Web and check her e-mail via your Mac's broadband Internet connection—or perhaps she'd like to use file sharing to swap MP3s with you. Your two-platform world can indeed be a harmonious one if you bring that Windows PC into the AirPort mix.

We'll show you how to create a dual-platform wireless AirPort network with which you can not only swap files among all your computers (we'll tell you how to do it with the wired ones, too) but also share your broadband Internet connection.

First we'll create an example AirPort-based network for a group of Macs, and then we'll guide you through configuring a PC's hardware and software to join that network. If you've already established your AirPort network, you can skip to step 5, which gets right into the PC-related tasks, including adding a wireless device.

Consult “What You’ll Need” for a checklist of supplies (which may vary depending on the Mac and PC models in your household). m

What You’ll Need

- At least one Mac running Mac OS 9, with an AirPort card. We've used a new iBook in our example network, but any AirPort-compatible Mac will do.

- One (or more) Ethernet-equipped Mac running Mac OS 9 (optional). We've used a Power Mac G3 in our example network; your network may include a similarly non-AirPort-compatible Mac.

- An AirPort Base Station ($299; Apple Computer, 800/692-7753, www.apple.com), which acts as a wireless router to connect all your computers to the Web and to one another.

- An Ethernet hub, such as a four- or eight-port hub made by LinkSys (949/261-1288, www.linksys.com) or 3Com (408/326-5000, www.3com.com). Four-port hubs usually cost less than $40.

- A broadband modem.

- Category-5 Ethernet cables. Also known as Cat-5 cables, they connect Ethernet-equipped Macs to the Ethernet hub, and provide the connections between your hub, AirPort Base Station, and broadband modem. They generally cost less than $5.

- At least one PC running Windows 95, 98, ME, or 2000, with a free ISA slot, PCI slot, or USB port (Windows 98, ME, or 2000 is required for the USB connection).

- A Windows-compatible, Wi-Fi-certified, IEEE 802.11b-compliant wireless networking device, such as a member of Agere Systems' Orinoco WaveLAN family of wireless networking products (800/372-2447, www.agere.com). See step 5 for advice on which ones to choose. Desktop PCs will require either a USB wireless device or a PCI- or ISA-based wireless adapter, and a PC Card. Laptop PCs require a PC Card. The total cost of these devices ranges between $50 and $220.

- Miramar Systems' PC MacLAN ($199; 800/966-2432, www.miramar.com) installed on any PCs in your network; it's necessary for sharing files between Macs and PCs.

More Info: www.macworld.com

For a list of other Macworld how-to articles, reviews, and news about wireless networking, go to www.macworld.com and enter wireless in the Search box.
Set Up Your Mac Network Begin by making the proper physical connections between the Macs on your network. This includes not only installing AirPort cards but also running cables between your non-AirPort wired Macs and your DSL, cable, or satellite broadband connection.

Copy Settings to Your AirPort Base Station Configure the Base Station to communicate with the Macs and share your broadband Internet connection. Have ready your TCP/IP settings, given to you by your ISP when you set up your broadband service.

Configure the AirPort-equipped Mac to log on to your ISP. Then use the AirPort Setup Assistant (in your Mac OS 9.X volume: Applications: Extras: AirPort) to copy those settings to the Base Station. For a network like the one in our example, you'd set up the Base Station this way:

With the latest version of Apple's AirPort software (1.3.1, as we go to press) running, launch the AirPort Setup Assistant on the AirPort-enabled iBook, and click on the Set Up An AirPort Base Station option. In the Internet Choice window, click on Yes to indicate that the iMac is configured to access the Internet.

If your ISP requires Point-to-Point Protocol over Ethernet (PPPoE), click on Yes in the PPPoE window. Otherwise, click on No.

In the Internet Access window, select the TCP/IP settings you want to copy to the Base Station and click on the right arrow.

In the next window, name your network (this name is your network's SSID, or Service Set Identification) and provide the password you'll enter when you need to configure the AirPort network with the AirPort Admin Utility. Finally, click on Go Ahead to install these settings on the Base Station. Wait while the settings are transferred to the Base Station.

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Configure Your Macs for the Network

Now that your Base Station is ready to share an IP address among your Macs, your Macs must be prepared to use the Base Station and its settings. Here’s how to set up the Macs on your network to share that single IP address.

Launch the AirPort Admin Utility from the AirPort-enabled iBook (also found in the AirPort folder), select your AirPort network, and click on Configure.

Access the Configuration window by entering the Base Station password that you created in step 2, and then click on the Network tab. Choose the Distribute IP Addresses option and the Share A Single IP Address (using DHCP & NAT) option.

When these options are selected, your Base Station acts as a router—the contact point between your network and the Internet. As far as your ISP knows, you’re using the single IP address allotted you from a single computer. In reality, the Base Station creates an internal network—distributing IP addresses to each computer within that network—that can share the single IP address provided by your ISP.

Our initial setup has a Mac connected to the network via an Ethernet cable. Because this Mac will access the Internet and the wireless network, choose the Enable DHCP Server on Ethernet option and the Enable AirPort to Ethernet Bridging option. Activating these options allows computers connected via Ethernet to join the network. If your network lacks such a wired connection, do not select these options.

On each Mac, open the AppleTalk control panel and, from the Connect Via pop-up menu, select the method by which your Mac is connected to the Base Station—AirPort if your Mac has an AirPort card, as does the iBook, and Ethernet if your Mac is wired to the hub, as is the Power Mac. Close and save.

Open the TCP/IP control panel, and select Configurations from the File menu. Select the appropriate configuration in the resulting window, click on Duplicate, create a new configuration and name it, and then click on the Make Active button.

In the TCP/IP window, be sure that the Connect Via pop-up menu displays the connection protocol appropriate for your Mac (AirPort or Ethernet). From the Configure pop-up menu, select Using DHCP Server.

Don’t be concerned with the empty fields. The information needed to establish your Internet connection, such as IP address and subnet mask, is stored in your Base Station. To confirm this, open the AirPort Admin Utility and click on the Internet tab.

Now log on to your AirPort network with the iBook by selecting the network’s name from the AirPort control strip module.

Your wired Mac will join the network automatically.
Choose Your Wireless Device  The wireless device you use will depend on the type of PC you have and whether it has PCI or ISA slots, USB ports, PC Card slots, or a combination of these. Also, some wireless devices work better than others.

There are four ways to connect a wireless client to your PC—via an ISA (Industry Standard Architecture) slot, a PCI slot, a USB port, or a PC Card. If you have a PC laptop, the obvious choice is a wireless PC Card. But if you have a desktop PC manufactured in the past couple of years, it's likely that your computer has ISA, PCI, and USB. Which should you choose?

If your desktop PC carries USB ports, purchase a USB-compatible wireless device such as the Orinoco USB Client. These devices are less expensive than their ISA or PCI counterparts. USB wireless devices are also easier to install and configure. Most PCs carry both ISA and PCI slots. If your PC does not have USB and has only PCI slots, your choice is simple—get a PCI adapter, such as the D-Link PCI Wireless adapter.

If your PC sports both kinds of slots, get an ISA adapter, such as the Orinoco ISA Adapter. Wireless devices attached to the ISA slot in a PC that has both ISA and PCI slots work more reliably with AirPort.

These PCI and ISA adapter cards are not wireless devices themselves; they provide only a place to install a wireless PC card—a WaveLAN Silver or D-Link PCMCIA Wireless LAN PC card, for example. To complete the connection, you must add such a PC wireless card. To ensure compatibility, use an adapter and PC Card from the same company.

Add a USB or PCI Device to Your PC

Your Macs should now be able to communicate with one another as well as with the Internet over AirPort. Now it's time to add the PC. How you do so depends on the kind of PC wireless device you chose in step 5.

Before connecting a wireless device to your PC, open the device's manual and carefully follow the installation instructions. Remember, this is Windows, and installing hardware under Windows can be tricky.

You'll probably have to install drivers and a configuration manager prior to installing the hardware itself. These drivers must be in place in order for Windows' Plug-and-Play feature to recognize the device. The necessary software should be on the CD or floppy disk that accompanies the device. You'll install it using an installation wizard like this one for Orinoco Client Manager.

The wizard will offer to locate the most appropriate available drivers. In some cases, you should allow this to occur; in others, you may need to direct the installer to a particular folder on the installation disk.

The manual that accompanies your wireless device will tell you the best way to proceed.

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Add an ISA Adapter
ISA wireless adapter cards are not recognized by Windows' Plug-and-Play feature—meaning that you can't simply install a driver and expect Windows to recognize the card when you insert it into the ISA slot. Instead, you must manually configure such devices.

For Windows to recognize an ISA adapter, you must first open up the PC and insert the adapter into a free ISA slot. Then run Windows' Add New Hardware control panel (select Control Panel from the Start menu's Settings command and double-click on Add New Hardware in the resulting window).

The Add New Hardware Wizard will ask if you'd like Windows to automatically detect any new system hardware. Click on Yes and then on the Next button. When Windows has finished searching for hardware, click on the Details button. You'll see that Windows has found a PCIC-compatible PCMCIA Controller card.

Select this item, and click on the Finish button to install the driver for the adapter. Windows will request that you restart your PC. Click on OK to restart.

With the adapter in place and recognized by the PC, insert the PC card into the adapter. The Add New Hardware Wizard will appear.

When the window that asks "What would you like Windows to do?" appears, insert the installation disk (CD or floppy) that came with your wireless PC Card. Select Search For The Best Driver For Your Device (Recommended). Windows will check the installation disk for PC Card drivers and install them. Click on Finish when the installation is complete and, if Windows asks you to, restart your PC.

Configure the Wireless Device to Become Part of the Network
Regrettably, wireless PC devices don't come with configuration applications as intuitive as Apple's AirPort Setup Assistant—these applications won't automatically seek out and join your AirPort network.

Orinoco Client Manager—the wireless configuration application that comes with Orinoco WaveLAN wireless devices—is typical of most of these programs. Here's how to set it up:

Click on the Programs item in the Start menu, locate the Orinoco folder, and select the Client Manager application within.

When the Client Manager appears, select Add/ Edit Configuration Profile from the Actions menu. In the resulting Select Profile window, be sure that Access Point is selected in the right menu, then click on Edit Profile B.

In the Edit Configuration window, select the Basic tab C, and in the Network Name field D, enter the exact name of your AirPort network, or SSID, which you established in step 2 (capitalization counts).

Click on OK to leave the Edit Configuration window and OK again to close the Select Profile window. The Client Manager will search for the network with the SSID you've provided and join that network when it's found.
Enable WEP Encryption AirPort supports 40-bit WEP (Wired Equivalent Privacy) key encryption (sometimes referred to as 64-bit encryption, even though the key is only 40 bits)—a scheme that attempts to keep others from “listening in” on your wireless network.

Enable encryption on the Base Station by launching the AirPort Admin Utility from the AirPort-enabled iBook. Go to the AirPort pane of the Configuration window, and select Enable Encryption (Using WEP) A. Click on the Change Network Password button B, and in the next window, enter and confirm your password. Click on the Update button.

Click on Configure, enter the configuration password, and select Equivalent Network Password from the Base Station menu. The string of ten characters that appears in this window is the WEP password your PC’s Client Manager will use. Write it down.

On the PC, launch Client Manager and select Add/Edit Configuration Profile from the Actions menu, click on the Edit Profile button, and click on the Encryption tab. Select the Enable Data Security option, choose Key 1 from the Encrypt Data Transmission Using menu, select the Use Hexadecimal (0-9, a-f) option, and in the Key 1 field, enter the 10-character WEP password.

Click on each window’s OK button to establish encrypted communication between the PC and the Base Station. If you have many PCs in your network, repeat this process for each.

Install PC MacLAN, and restart your PC. On restart you’ll likely see an error message indicating that PC MacLAN was unable to register your PC on the network. To fix this, open the PC’s Network control panel (choose Start: Settings: Control Panel, and then double-click on the Network control panel), select the Miramar Systems AppleTalk Protocol For NDIS entry, and click on the Properties button.

In the next window, click on the Settings tab and deselect the Autobind option. Select your wireless device from the Selected Adapter pop-up menu. Click on OK in the open network windows, and restart the PC when Windows asks you to. Launch PC MacLAN File Server, and click on the Start Server button.

To share files on the PC, click on PC MacLAN’s Users And Groups button, click on New, enter a name and password, and assign yourself access privileges. Click on the Share Folders button, select the folders or volumes you want to share, and choose who can share these files and volumes. Click on Done.

To access your networked Mac volumes, double-click on Network Neighborhood on the PC’s desktop. To work with your PC files from the Mac, select them from the Chooser.

Now you’re all set to share files, surf the Web, and send e-mail wirelessly on a mixed-platform network.
Print Publishing Secrets

When you send digital images to a printing press, the color files must be in CMYK format—but that doesn’t necessarily mean the images should start out that way. Editing files in RGB mode can have advantages, while some editing tasks are best done in CMYK, so it’s wise to be comfortable with both modes.

We’ll explore which mode to use when, and how to convert from one to the other.

**CMYK All the Way?**
If you’re lucky enough to work in a closed-loop, all-CMYK workflow, where you know the printing conditions at the time you scan your images, stick to that format. If you start out with CMYK scans, converting them to RGB for editing purposes is a mistake—you’ll lose more than you’ll gain. However, the circumstances that call for an all-CMYK workflow—always printing to the same press, with the same inks, on the same paper stock, with no other use for the image—are becoming rarer.

**Strike One** It’s crazy to work in CMYK if you don’t have a clear idea of your job’s printing conditions, because CMYK separations that work well on a sheetfed press can produce mud on a web press, and worse than mud on newsprint. Unless you know which inks and paper the printer will use for your job (and can therefore adjust for them), your image may wind up looking quite different from what you envisioned.

**Strike Two** Designers often put images to multiple uses: they may need an RGB version for the Web, a CMYK one for print, and even multiple print versions. But turning a CMYK scan into an RGB file typically produces poor results on the Web—monitors can display many colors that CMYK print can’t reproduce, and CMYK print contains a few colors that monitors can’t reproduce.

**RGB Only?**
The other extreme—working entirely in RGB and then putting your RGB image through an automated conversion process before printing—won’t give you good results either. Great color takes intelligent human intervention. The RGB-to-CMYK conversion that can do justice to both a pastel early-morning landscape and a saturated tabletop product shot simply doesn’t exist and probably never will.

**The Right Times for RGB**
It’s a great deal easier to correct color casts in RGB than in CMYK. One of the wonderful properties of Adobe Photoshop’s RGB working spaces is that equal values of red, green, and blue always produce a neutral gray. You can fix the vast majority of color problems by finding an image element that you know should be neutral and then using the Curves feature to make it neutral. When you do so, the rest of the colors simply fall into place. It’s much more difficult to tweak four curves to produce the unequal amounts of cyan, magenta, yellow, and black that result in a neutral color.

Compositing and image manipulation are also easier in RGB. In CMYK, many Photoshop filters, including Lens Flare, Lighting Effects, and all the Artistic and Texture filters, don’t work at all. Others, such as Emboss, produce unpredictable results.

In RGB mode, you can avoid violating ink limits. No press can handle 100 percent of all four inks. At best, overinking will cause images to look muddy. At worst, it causes the paper to disintegrate, making a mess on a sheetfed press and creating a life-threatening situation on a web press if the paper breaks! Most presses work best...
when they reproduce the darkest tones using somewhere between 240 percent (for newsprint) and about 340 percent (for high-quality sheetfed printing) total ink. When you work in RGB, your CMYK conversion settings determine your total ink limit. But there’s no ink-limit safeguard in CMYK.

Probably the best reason to make as many edits as possible in RGB before converting an image to CMYK is that when you convert the image, it loses about half a bit of potentially valuable data. These losses aren’t obvious at first, but the more you edit the image, the likelier you are to see posterization or color banding.

Get the Best of Both To enjoy the best of both the RGB and the CMYK worlds, do most of your editing in RGB, but check your work as a CMYK simulation (use the Proof Colors tool in Photoshop 6, and CMYK Preview in older versions). An image on a monitor will never exactly match an image on paper, but it can come very close—probably as close as traditional proofs (which seldom precisely match the press sheet). Photoshop’s CMYK previews will show you the more muted color that conversion to CMYK inevitably produces. (For more on soft-proothing, see “Show Your True Colors,” How-to, April 2001.)

When CMYK Fits the Bill

Some types of editing you can do only in CMYK, and other types are easier in CMYK than in RGB. The black plate in CMYK has a major effect on the overall image, and some powerful techniques rely on manipulating the black channel, which isn’t possible in RGB.

For example, I often use Photoshop’s Channel Mixer tool to take black out of some flesh tones: I set the output channel to black, subtract some magenta and a bit more yellow, and then increase the black value to slightly more than 100 percent to preserve the tonal values (a typical setting might be Magenta -4, Yellow -12, and Black +108).

Another classic black-plate trick can improve head shots, where you want to sharpen hair, eyes, and eyelashes without emphasizing skin texture. Sharpening only the black channel while leaving the cyan, magenta, and yellow channels soft makes the hair and eyes snap without oversharpening the skin or lips.

In CMYK, making subtle adjustments using the Hue/Saturation tool is much easier than it is in RGB, where the tool manipulates light and is rather blunt. In CMYK, you manipulate ink percentages with surgical precision.

CMYK also makes it easier to control detail in red, green, and blue objects by manipulating the opposite color: in a green object, the magenta plate holds most of the detail; in a red object, it’s the cyan plate; and in a blue object, the yellow plate. (The same principle applies in RGB images, but it works instead for cyan, magenta, and yellow objects, which seem to be a lot less common than red and green ones.) So to increase detail in green foliage, you increase the contrast on the magenta plate. I usually use the Curves tool to do this—the steeper the curve, the greater the contrast. To get the same results in RGB, you’d have to adjust both the red and blue curves, and that takes more work than adjusting a single curve, as you do in CMYK.

Conversion-Process Tips

When you convert an image to CMYK, Photoshop will ask you if you want to flatten it. You do. Layer blending that works beautifully in RGB may look very different in CMYK.

It’s always a good idea to save and archive the edited, layered RGB file and then convert a duplicate to CMYK. If your client suddenly decides that the image you prepared for a newspaper ad would look great in an annual report, you’ll have a much easier time getting a good sheetfed CMYK separation from the edited RGB file than you would from the newsprint separations. Ditto if the ad runs in Japanese magazines, which use inks that are substantially different from those in U.S. publications.

Ambidextrous Image Editing

If you handle most of your editing in RGB, you’ll find that fine-tuning is all you have to do after converting an image to CMYK. And it’s this fine-tuning that will make the difference between color that’s acceptable and color that makes your clients say “Wow!”

Contributing Editor BRUCE FRASER is a self-confessed color geek and a coauthor of Real World Photoshop 6 (Peachpit Press, 2001). You can reach him at bruce@pixelboyz.com.
All Web designers share two goals: to build Web pages quickly, and to keep those pages fast and lean so visitors to their sites don’t have to wait. With even a basic understanding of Cascading Style Sheets (CSS), you can achieve both of these goals. And by using techniques outlined in this column to raise your CSS skills to the next level, you’ll be able to build fast-loading pages in record time.

CSS Basics
CSS gives Web designers a wide range of formatting options not possible with HTML alone; a CSS style can include margin settings, first-line indents, text leading, and precise border control.

CSS pages tend to load more quickly, too. CSS lets you format text without the font tag and can more succinctly define attributes for other HTML elements, such as tables and images.

At its root, a CSS style simply tells a Web browser how to display a particular piece of an HTML document. The two main types of CSS styles—class styles and tag selectors—let you control how formatting is applied.

Class Styles
As you can with styles in programs such as Microsoft Word and QuarkXPress, you can name class styles and then apply them manually. For example, to format the main text of a Web page, you could create a class style named bodyCopy that specified font, color, leading, and other formatting options. To apply it to a paragraph, you’d simply add a small amount of code to the appropriate tag: <p class="bodyCopy">.

But although class styles allow you to format just the page elements you choose, they also require additional code and extra work. Adding class="bodyCopy" to a single paragraph tag isn’t too time-consuming, but formatting hundreds of pages in this way certainly is.

Tag Selectors
There is another method—tag selectors redefine the behavior of a page’s HTML tags. By creating a style for the p tag, for example, you could make all paragraphs on a page display in red text that is 36 pixels tall. With tag selectors, instead of making up a name for the style, you use the name of the tag—for example, td for a table cell or p for a paragraph.

In addition, you don’t need to apply the style manually; Web browsers automatically apply the tag selector’s formatting to every section of text contained within that tag.

Although automatic formatting can be a time-saver, a tag selector’s approach isn’t always desirable. You might not want every paragraph to look the same. You may need to divide a Web page into different sections—for example, a main content area, and two sidebars that have smaller text than the main area has.

If you know how to use a CSS refinement called contextual selectors, it’s easy to take advantage of the benefits offered by class styles and tag selectors while avoiding their pitfalls.

Contextual Selectors to the Rescue
A contextual selector allows you to limit the application of a style to HTML in a specific context. For instance, you can create a style that formats the text contained within a p tag as blue and 9 pixels tall only when that text appears within a sidebar. How does a Web browser know the tag is inside a sidebar? You need to tell it—by using a class style to define that page area’s context.

For an example of a common table-based page layout, see “Context Is Crucial”: the beige box on the left side of the page is a single table cell, while the white box on the
right is another cell, used for the page’s main content. By creating a class called “main” and applying it to the td tag of the main content cell, you set the context for all other HTML placed inside that cell. Now a browser will consider any tag inside that cell to be within the context of the main style. This approach combines the selective control of class styles and the automated formatting of tag selectors.

Creating a Contextual Selector

It’s no more difficult to create a contextual selector style than it is to create a class style or tag selector. Simply add the context (which class or tag the style must appear within) when defining the style. To create two styles—main and sidebar—for the layout cells of a page, and two styles for paragraphs that appear inside the cells, you might use this code:

```html
<style type="text/css">
  .main { background-color: #FFFFFF }  
  .sidebar { background-color: #CCCCCC }  
  .sidebar p { font-size: 10px; color: #000099 }  
  .main p { font-family: Georgia, Times, serif; font-size: 12px; color: #FF0000 }  
</style>
```

The .sidebar p code is a contextual selector and indicates that the style should apply to p tags only when they’re inside a segment of the document defined as class="sidebar".

Context is Crucial The HTML code in the table cell on the left is exactly the same as the code in the cell on the right. Only their contexts differ; a cell that has a class style applied to it contains the sidebar content. Therefore, all of the tags in that cell are in the context of the sidebar style.

There’s an added benefit—if you copy text from the sidebar and paste it into the main content cell, you won’t need to do any formatting. As the context of that text changes, so does the style used to format it, making it easy to reuse HTML content in other parts of the page or elsewhere on your site without having to reformat it.

CSS provides designers with previously unavailable power to control the look of Web pages—and looking good can go hand in hand with working smart. Using these simple steps, you can take advantage of the space- and time-saving benefits of contextual selectors.


Creating Contextual Selectors in Macromedia Dreamweaver and Adobe GoLive

These visual HTML editors have slightly different methods.

Dreamweaver

When creating a new contextual selector, choose the Use CSS Selector option in the New Style window, and then type the style name in the Selector field. For example, if you want to create a style for all p tags that appear within the context of HTML formatted with a sidebar class style, type .sidebar p in the field. Click on the OK button and continue to create your style using Dreamweaver’s standard method.

GoLive

Creating a contextual selector in GoLive is even easier: in the Style Sheet toolbar, click on any of the three Style buttons—Tag, Class, or ID. In the Basics tab of the CSS Selector Inspector, type the name of the contextual selector; for example, .sidebar p to create a style for every p tag in the sidebar class.

Unfortunately, although GoLive does let you create contextual selectors, it can’t display contextual-selector styles—you’ll need to preview your Web page in a CSS-compliant browser to see how they look. In addition, GoLive treats any contextual selector that begins with a class name—such as .sidebar p—as a class style. The contextual selector will appear under the Style tab of the Text Inspector, and GoLive even lets you apply it as you would any other class. However, applying it in this way is incorrect, and although GoLive will display the style properties, CSS-compliant browsers won’t.
Mac OS X Secrets

Maybe you don’t work on top-secret documents, run a Web site, or write clandestine love letters on your Mac OS X machine. Still, if it’s on a network or continuously logged on to the Internet, you should be concerned about security. Always-on broadband connections leave your Mac vulnerable to attack. It’s up to you to see that you don’t become a victim of criminals—or of plain old mistakes.

**Worst-Case Scenarios**

What can happen if you don’t take our security recommendations to heart? Determined intruders can not only read and destroy your data, but also damage your operating system by changing settings or deleting or adding files. They can even steal your identity—which they can use in gaining access to other computers, sometimes leaving behind harmful programs that will cause problems later.

Although the flexibility of OS X’s Unix foundation means that miscreants can more easily mess with your Mac, Apple has done a lot to protect your system—and you can do much more, short of pulling the network plug altogether. Here’s how.

**DON’T Create Unnecessary Administrator Accounts**

Mac OS X provides two kinds of accounts: administrator accounts and user accounts. An administrator can change settings, install software, and open accounts for other users. Administrators also have access to much of the Mac’s hidden Unix folder structure.

Users, on the other hand, can see and use only folders within their Home directory or other users’ Public folders. They can run applications, but they can’t modify system preferences. Administrators can safely give user accounts limited access to an OS X machine.

If, like most Macs, yours has only one primary user, you can protect yourself by not creating extra accounts, especially administrator accounts. Anyone who gets hold of the administrative-account password can change system preferences or install applications; you may want to log in routinely as a user, entering the administrative password only when you need to make a change.

**DO Use Sudo**

Most attacks on Unix computers happen when an unauthorized person gains root access to the machine. The Unix root account is all-powerful; with it, someone can completely control the Mac from a remote location, modify or delete important files, enable network services, and destroy system components. Apple has disabled the root account in Mac OS X, and although you can activate it, there’s no reason to, even if you need access to Unix applications.

By using the sudo command instead, experienced users can act as root without fear of compromising the Mac’s security or doing any serious damage (see Mac OS X Secrets, October 2001). And with root access unavailable, intruders have one fewer way to enter your system.

**DON’T Be Careless with Network Services**

An easy way to protect your Mac is to give outside users only minimal access to it. OS X includes support for file sharing; remote access via the command line using SSH (Secure Shell); Web sharing; and FTP (File Transfer Protocol). You can also add third-party network applications such as Timbuktu, and access to FileMaker Pro databases. But don’t enable services that you don’t need.

When you install OS X, most networking services that allow others to connect to your Mac are turned off
(though your Mac will be ready for you to log on to other networks if you used the Setup Assistant during installation).

Find out which incoming network services are deactivated. Open the Sharing application within System Preferences. Here you’ll find the doorways to most methods of network access to your Mac; activating any one of them provides a means for intruders to access your computer. Use only those that you know you need.

**DO Use File Sharing—Carefully**
File sharing is safer than other networking applications. You can grant access to only the directories you want to share, keeping file-sharing users out of your machine’s sensitive system directories. In addition, file-sharing passwords are encrypted, so they’re less likely to be intercepted by a network sniffer—a program or device that captures network data as it travels to its destination.

You can add further protections by setting privileges for individual folders. To do this, select the folder in the Finder, choose Show Info from the File menu, and then select Privileges. Provide the fewest privileges you can get along with. For example, if you don’t need to share your files, you might deny access to the Public folder in your Home directory.

**DON’T Enable Remote Login and FTP Access**
The riskiest options in the security spectrum are Remote Login and FTP access. Remote Login lets a user connect to your Mac remotely using a terminal emulator (see Mac OS X Secrets, September 2001). Though Mac OS 10.0.1 and later replace the very insecure Telnet with the safer SSH, you should probably leave Remote Login turned off. If you must enable it, be sure you’ve updated to the latest version of Mac OS X.

Mac OS X 10.1’s enhanced support for file sharing between Macs and PCs makes using FTP unnecessary. It’s also risky, because FTP passwords are not encrypted as they traverse a network. If you must allow FTP access, protect the administrator password by giving users with administrator accounts different passwords.

**DO Use Web Sharing**
Mac OS X Web sharing is actually a version of Apache Web server (found on many Unix systems). By activating Web sharing (in the Sharing panel), you launch Apache. The Sites folder in the directory of each user on your Mac then becomes publicly accessible—along with any files that are contained within that folder.

Because it doesn’t expose the rest of your Mac, Web sharing is fairly secure, and there are no passwords or command-line entry methods to protect. The key to secure Web sharing is placing only files meant to be shared into Sites folders. If a user doesn’t need to share files via the Web, delete that user’s Sites folder or use the Privileges settings to make the folder unavailable.

**DO Use a Firewall**
If you plan to allow network access to your Mac, you should consider taking some additional precautions. Software firewalls can track and repel unwanted visitors, and you can set them to allow access only from approved IP addresses or to block port scans, pinging, and other tactics hackers use to size up your Mac’s vulnerability.

You can also use firewall software to block some or all of the communications channels, called ports, that network services such as Web sharing use to connect to your Mac. If you blocked port 80 using a firewall, for example, a visitor wouldn’t be able to get to your Web site.

Some tools, including Brian Hill’s shareware BrickHouse ($25; http://personallpages.tds.net/~brian_hill) and Pliris’s Firewalk X ($12; www.pliris-soft.com), provide a graphical interface for ipfw, OS X’s built-in Unix-based firewall. You can also assess your security risk by using Open Door Networks’ security-auditing application Who’s There Firewall Advisor ($49; 541/488-4127, www.opendoor.com).

**Stay Safe**
Despite the security challenges posed by its Unix foundation, Mac OS X has built-in protection that should help you in your efforts to keep your Mac safe. With a combination of common sense and judicious limits on incoming Internet access, you can minimize your Mac’s exposure to potential danger and lessen the likelihood of security breaches.

Shelly Brisbin is freelance writer based in Austin, Texas. She is a coauthor of Mac OS X for Dummies (Hungry Minds, 2001).
Mac 911

As my newborn daughter gazes up at me from her monkey-and-tiger-themed bassinet, her eyes are filled with questions: “What will I become? What kind of world awaits me? When I get my new iMac, Daddy, how should I maintain it; how can I open Mac OS 9.1 documents in Mac OS X; how can I create a bootable start-up disc; and how can I opt out of DoubleClick ads?”

Maintaining Your Mac

Q. How often should I perform maintenance on my hard drive, and what kind of maintenance should I perform?

TOM KISANUKI
Honolulu, Hawaii

A. If you were to ask ten Mac troubleshooting gurus for an opinion on this subject, you would probably get eleven answers. For example, there are those who religiously follow Apple's advice to rebuild the desktop file once a month. Others tattle around under the hood only when a Mac refuses to boot. I fall somewhere in between those extremes.

When it comes to a relatively harmless maintenance procedure such as rebuilding the desktop (holding down the ~ and option keys at start-up), I wait until my Mac is acting up. An obvious sign that the desktop needs rebuilding is when generic icons appear in place of their colorful counterparts. But there are also less-obvious indications of trouble. For example, if my Mac seems sluggish, I'll run Micromat's free TechTool Lite (800/829-6227, www.micromat.com) to rebuild the desktop from scratch. Zapping the PRAM—resetting the Mac's parameter RAM by holding down ~-option-P-R at start-up—I leave for more serious situations (like when a Mac refuses to boot).

When it comes to more-intrusive maintenance procedures—running diagnostic and repair utilities such as Alsoft's DiskWarrior ($70; 281/353-4090, www.alsoft.com), Micromat's TechTool Pro ($98) and Symantec's Norton Utilities ($100; 408/517-8000, www.symantec.com)—I fall into the “If it ain't broke, don't fix it” camp. These are useful tools, but they have the potential to leave your Mac in a more fragile state than it was in before you enlisted their help. I therefore use these utilities only when my Macintosh really seems to need them—when it routinely crashes for no apparent reason or a volume refuses to mount.

Underlying my somewhat lackadaisical attitude toward preventive maintenance is the sense of well-being that comes with having an up-to-date backup of all my important data. If you don't have the same sense of security, you should glom on to it as soon as possible by implementing a backup strategy today. (For help with this process, see “Save Your Data,” September 2001.)

Going Native

Q. I'm having trouble getting some of my files to open in OS X applications. For instance, when I double-click on a file that should be viewable in OS X programs such as TextEdit and Preview, the Classic environment launches and the file opens in something like SimpleText. How can I force these files to open in a native OS X application?

ROBERT SINCLAIR
Chanute, Kansas

A. This is frustrating, and it's something I hope Apple will address in a future update of OS X. Although OS X allows you to designate a particular application to open a particular document type (you do so in the Show Application
portion of the Get Info window), the method it provides does not work with SimpleText documents. If SimpleText was used to create a file, by gum, then OS X will launch the Classic environment (if it’s not already running), where it can open the document in SimpleText.

Thankfully, this conundrum has some fairly simple workarounds. If you have the Developer Tools CD that ships with OS X, install it. Included in the installation is a Carbonized version of SimpleText. When you have this version of the application installed and you double-click on a SimpleText document, the new version of SimpleText launches without booting up the Classic environment. Unfortunately, this native version of SimpleText is not available for download from Apple's Web site.)

I drag and drop documents not created by SimpleText to Wipe Creator, a free AppleScript droplet from Scotland Software (www.scotlandsoftware.com) that strips the creator code from any document dropped on it. Removing this code allows OS X to open files in OS X-native applications. For example, if you drop a JPEG file on Wipe Creator, that file will open in OS X's Preview rather than in the non-OS X application that created it.

### Creation Theory

**Q. How do I create a bootable start-up CD, and what should I put on it?**

Joan Taft  
New York, New York

A. Unless, like me, you’re sometimes heedless about where you leave those items most precious to you, you already have a start-up disc of sorts—the system software CD that came with your Mac. But it doesn’t include all the tools you need to boot your Mac and bring it back from the dead. You can create a CD that will do both.

First, you’ll require software with which to create a bootable CD. I regret to say that Apple’s Disc Burner does not fill the bill—it can’t create bootable discs.

If you’ve bought a third-party CD-RW drive, though, you’ve probably got the best tool for the job—Roxio’s Toast. If you don’t have a copy of Toast, you can buy Toast Titanium for $100 (866/280-7694, www.roxio.com). The version of Toast that ships with most third-party CD-RW drives doesn’t have as many features as Toast Titanium, but it can create bootable CDs. Here is how I’d do the job:

Launch Apple’s Disk Copy (in Mac OS 9.1, it’s in the Utilities folder inside the Applications folder), and select Create New Image from the Image menu. In the resulting window, give the disk image a descriptive name—for example, “Emergency.” Select 663,000K (CD-ROM 12cm, Full) from the Size pop-up menu, make sure the Mount Image option is selected, and click on Save (see “Image Is Everything”).

Insert your system-software installation CD; then locate and launch the Mac OS Install application. Select the disk image you just created (in our example, the Emergency disk image) as the installation’s destination. You can install a full system, or you can click on the installer’s Customize button if you want to install a slimmed-down System Folder—just the Mac OS 9.1 option, for example. After the installation is complete, open

A. How do I create a bootable start-up CD, and what should I put on it?

**How-to Mac 911**

**Tip of the Month**

In Mac OS 9.1, you can hide a background application with a single keystroke. Here’s how:

Launch the Keyboard control panel and click on the Function Keys button. Open your Mac’s System Folder, then the Apple Menu Items folder, and then the Speakable Items folder. (Editor’s note: If the Speakable Items folder isn’t present, you must custom-install the English Speech Recognition software from the Mac OS 9.1 Installation disc.) Drag the Hide All Applications AppleScript to an empty function-key slot, and click on OK. Now when you press that function key, the AppleScript will hide all open applications and return you to the Finder.

Gregory Meach  
Canaan, Connecticut
Unsolicited Advice

My greatest desire is that spammers—the soulless scoundrels who fill your e-mailbox with unsolicited crud—some day meet an everlastinglly fiery end. But while we wait for divine retribution, you can do something about their effluvia. Namely, use your e-mail client’s filtering feature to scan e-mail for certain key words in the subject heading. You can direct your client to channel these messages directly into the Deleted Items folder (though you may want to scan the contents of this folder from time to time, in case a correspondent accidentally used one of the forbidden words in the subject heading of a message that you want to receive).

I’d suggest that you add the following words and phrases to your junk-mail filter list:

$$$ 
ADV 
advertising 
anything anyone 
barely legal 
casino 
credit card 

e-mail address list 
extra cash 
financial freedom 
find out anything 
fire your boss 
free vacation 
gambling 
I love you and I don’t want you to die 
make money 
save money 
Viagra 
XXX

And, of course, any message whose body text includes “Richard Simmons” should be deleted without fail (unless, of course, you are Richard Simmons).

Also, for those of you confounded by the Apple-Script (published in September 2001’s Mac 911 column) that lets you place double arrows on scroll bars, a bit more information may help. The “double angle brackets” that appear in the tip are actually punctuation marks known to discerning grammarians as guillemets (and to ho! polloi as French quotation marks). To create the guillemets (« and ») in the script below, type option-\ (forward slash) and shift-option-\, respectively, not the angle bracket characters.

```
tell application "Appearance"
  set scroll bar arrow style to «constant
  xxxx.dubl»
quit
end tell
```

I’ve never found Disk Light to be very useful, so I drag it out of the Control Panels folder. Likewise, because you can’t update the version of Norton Utilities on the CD (it’s read-only, after all), I also toss out Live Update.

TechTool Pro 3 is a little trickier. You must first install it on your Mac’s hard drive, along with any available updates. Then run the copy on your hard drive and select Preferences in the Edit menu. In the window that appears, deselect the Auto-Update Protection Files option (because your Emergency CD will be read-only, TechTool can’t update its protection files). Quit TechTool.

Install a copy of TechTool Pro 3 and its updates on your Emergency image. Open the Preferences folder on your Mac and copy the TechTool Pro Pref file to the Preference folder of the System Folder on your Emergency image. This allows the copy of TechTool on the Emergency image to launch properly without trying to update your protection files.

You’re finally ready to burn your Emergency disc. Just launch Toast, select the Files & Folders option from the Format menu, and click on the Data button and then on the New CD button. Select all the files in your Emergency image and drag them into Toast’s Files & Folders window. Now burn, baby, burn.

DoubleClick Trick

Q. I’ve read reports that some online marketers track users’ Internet browsing in ways I’m not comfortable with. Is there anything I can do to keep them from tracking me?

TURNER ROUSE
Fayetteville, North Carolina

A. Marketing outfits such as DoubleClick have indeed engaged in practices that make many people uncomfortable—for example, using browser cookies to gather personally identifiable data and employing that information to target Web advertisements more specifically. The legality of such actions is under scrutiny, but rather than wait for the court’s decision, why not just tell DoubleClick to butt out of your business? You can do so by traveling to this Web site: www.doubleclick.net:80/us/corporate/privacy/privacy/ad-cookie/default.asp?asp_object_1=& and, with cookies enabled, clicking on the Opt-Out button. This places a cookie in your browser that repels any additional cookies the DoubleClick system might want to plant.

Contributing Editor CHRISTOPHER BREEN is Big Daddy of the Macworld e-newsletter’s Daily Tips (www.macworld.com/newsletters).

Share tips and discuss Mac problems with other Mac users in the Mac 911 forum (www.macworld.com/subject/mac911). Also send tips and questions by e-mail to mac911@macworld.com. Macworld pays $50 for tips selected for publication in Macworld. All published submissions become the sole property of Macworld.

Shareware and freeware mentioned in Mac 911 are available from ZDNet’s Macdownload.com (www.macdownload.com).
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### iMac Series

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### iBook Series

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*Professional installation fee of $30 required for free RAM. Hurry! MacMail RAM promotion ends 11/12/01.

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only $69 #74683

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- 42-bit color
- 8.5" x 11.7" scan area
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**Canon SonicBLUE Handspring Visor Edge**

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**HP C315XI Digital Camera**

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**Canon ZR20 DV Camcorder**

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**SonicBLUE Rio 600 MP3 Player**

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CALL FOR BEST PRICE

*After $100 Apple and $50 or $10 Mac Zone mail-in rebates. Limit one each per customer. Restrictions may apply. Coupons available at www.zones.com/rebates. Offers good through 10/14/01. **After $50 Canon mail-in rebate. Offer good through 12/31/01*

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<td>iMovie 2</td>
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ONLY $994.98

Indigo #136130
Graphite #136131
Snow #136133

$1294.98

Indigo #136130
Graphite #136131
Snow #136133

$1494.98

Indigo #136130
Graphite #136131
Snow #136133

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With similar size-slimming style cues from the Titanium PowerBook G4, the new iBook’s eye-catching, total redesign is very outwardly apparent. At only 4.9 pounds and measuring just 1.3” thin, it’s small enough – and powerful enough – to fit any mobile lifestyle. And now you also get a 500MHz G3 processor and your choice of optical drives – a CD-ROM drive, DVD-ROM or combo CD-RW/DVD-ROM drive.

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<td>iTunes</td>
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A102 2040 | 500Mhz G3 | DVD/CDR-W | 128MB | 10GB | $1795 | $44/mo |

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<td>M905 2449</td>
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<table>
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<tr>
<th>Part #</th>
<th>Mhz</th>
<th>Optical Drive</th>
<th>Base Ram</th>
<th>HD</th>
<th>Price</th>
<th>Or as low as</th>
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</thead>
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A102 1892 | 400Mhz G4 | DVD-ROM | 128MB | 10GB | $1995 | $60/mo |
A102 1893 | 500Mhz G4 | DVD-ROM | 256MB | 20GB | $2995 | $82/mo |

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- **2D/3D Graphics**
- **Built in 10/100Base-t**
- **56K Modem**

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and e-mail it to Jason," and turn it into the command "Look for a Word file larger than 20K, last modified yesterday at 5 p.m. If there's only one, convert it to HTML, and if there's only one Jason in the address book, e-mail it to him; otherwise, ask me which Jason I mean." And this is eminently doable. The success with which iListen and ViaVoice can turn voice into text and the ease with which the Newton OS was able to parse complex commands prove it.

That's All There Is?
I am convinced that untold riches await the first company that makes a voice interface work really well. Did you ever see Mr. Spock operate a mouse? I rest my case. But we present-day humans tend to resist any interface that doesn't involve our familiar and stagnant collection of elements.

Since 1984, the capabilities of personal computers have increased exponentially. But the interface itself hasn't taken any significant steps forward—it still consists of an on-screen pointer that acts on a collection of menus, windows, and icons. Aqua is a highly valuable and experience-enriching face-lift—but it's just a face-lift. After 17 years of experience as users and as developers, have we all agreed that we got it perfect the very first time? Or have we simply grown complacent and abandoned the quest for anything better?

The scariest notion is that little by little, Windows and even Linux are starting to catch up to the Mac, at least in terms of the interface. I installed a beta of Windows XP the other day, and my jaw dropped: at last, the GUI doesn't look like someone designed it on an Etch A Sketch. Thank heavens Microsoft stopped putting the year of release into the name. We currently go around spray-painting "Windows 98 = Mac OS '90" on highway overpasses, but "Windows 2001 = Mac OS Early '99" wouldn't really have the same punch.

But for all its advances, even Windows XP boils down to click, double-click, drag. As Mac users, we expect more. We want to speak, acknowledge, walk away because the Mac can take it from there. Or we want our screens to resemble the flattened front of a virtual sphere that we can spin to reveal new views of the Internet, the file system, or the user experience.

Changing the interface for change's sake is dippy. We see the result every time users running Mac OS X want to close a window but hesitate, momentarily unsure if they're choosing "stop using this window" or "I'm done; this window may now go."

But it's also true that the only difference between a rut and a grave is their depth.

Columnist ANDY IHNATKO (www.cwob.com) talks to his Mac all the time—but he's convinced that it's ignoring him.
I F I LIVE TO BE 100, I will never stop telling people that—with a few rare exceptions—every Randy Newman song sounds like all other Randy Newman songs, which sound like toilet-paper jingles. Similarly, when it comes to Mac OS X’s Aqua interface, I will never tire of asserting that the colors of a traffic signal do not by any stretch of the imagination make a user immediately think of closing, minimizing, and maximizing. Closing a window does not stop anything, and maximizing one doesn’t make anything go—and what’s so cautious about putting a window into the Dock?

I do like Aqua. It prettified the Mac, and for the most part, all that on-screen shadowing, highlighting, melting, and throbbing make for an interface that’s visually easier to navigate. It’s a swell face-lift for a familiar look. But what if Apple went for more than a face-lift?

Let me tell you about an idea I recently had. Like most of my ideas, it came to me while I was napping on my sofa and trying to come up with a way to avoid actual work. While I napped and evaded, my G4 Cube called out, telling me I had new mail.

Big deal. It happens all the time, now that my Internet connection is on 24-7. This time, though—possibly owing to my having had three sodas in the space of 40 minutes—my eyes were open: Wait, this just might be incredibly cool! I had access to the G4 without physical proximity or any sort of device or accessory. I got information from it without having to turn my head, even.

Why don’t we normally think of speech as a user interface? Because it involves no pointing devices or bouncing icons? Is that any excuse?

Audio Interface
That’s when my idea hit—and as usual, it involved going to Radio Shack and spending a lot of money.

I came home with about six omnidirectional microphones, a line-level amp, and a cheap mixer. Three or four missed deadlines later, I had wired my entire office for sound. Through discreetly placed microphones, my G4 could receive voice input from anywhere in my big office-cum-den.

Now when my computer says, “You have new mail,” I can reply, “Is it important?” And unless Mailsmith sees a message from someone I’ve designated Important, the G4 advises me that I needn’t stir from my sofa and my P.G. Wodehouse.

I enjoyed that so much that I expanded the system in both coverage and capability. I have another six mikes scattered across the house (in the kitchen, near my front door, and in the TV room) and a couple dozen new scripts that do things way more interesting than fool with my mail.

None of this is rocket science. It all exploits standard features of Mac OS 9. In fact, the lack of sophistication is my sole disappointment with this system. My Mac doesn’t actually parse these sentences. When I awaken and groggily ask the PowerBook on my nightstand to “get me the morning news,” I’m really firing up an AppleScript with that exact title, which opens all of the URLs within a Morning News folder.

Speech is the most jaw-droppingly obvious unexploited resource in the user-interface world. IBM and MacSpeech have made great leaps with their speech products in the past year, but jeez, these products are still not much more than keyboard replacements. I’ve got a keyboard. What I want is a utility that can take a sentence like “Convert that big manuscript I worked on last night to HTML, continue on page 131"
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