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Macworld

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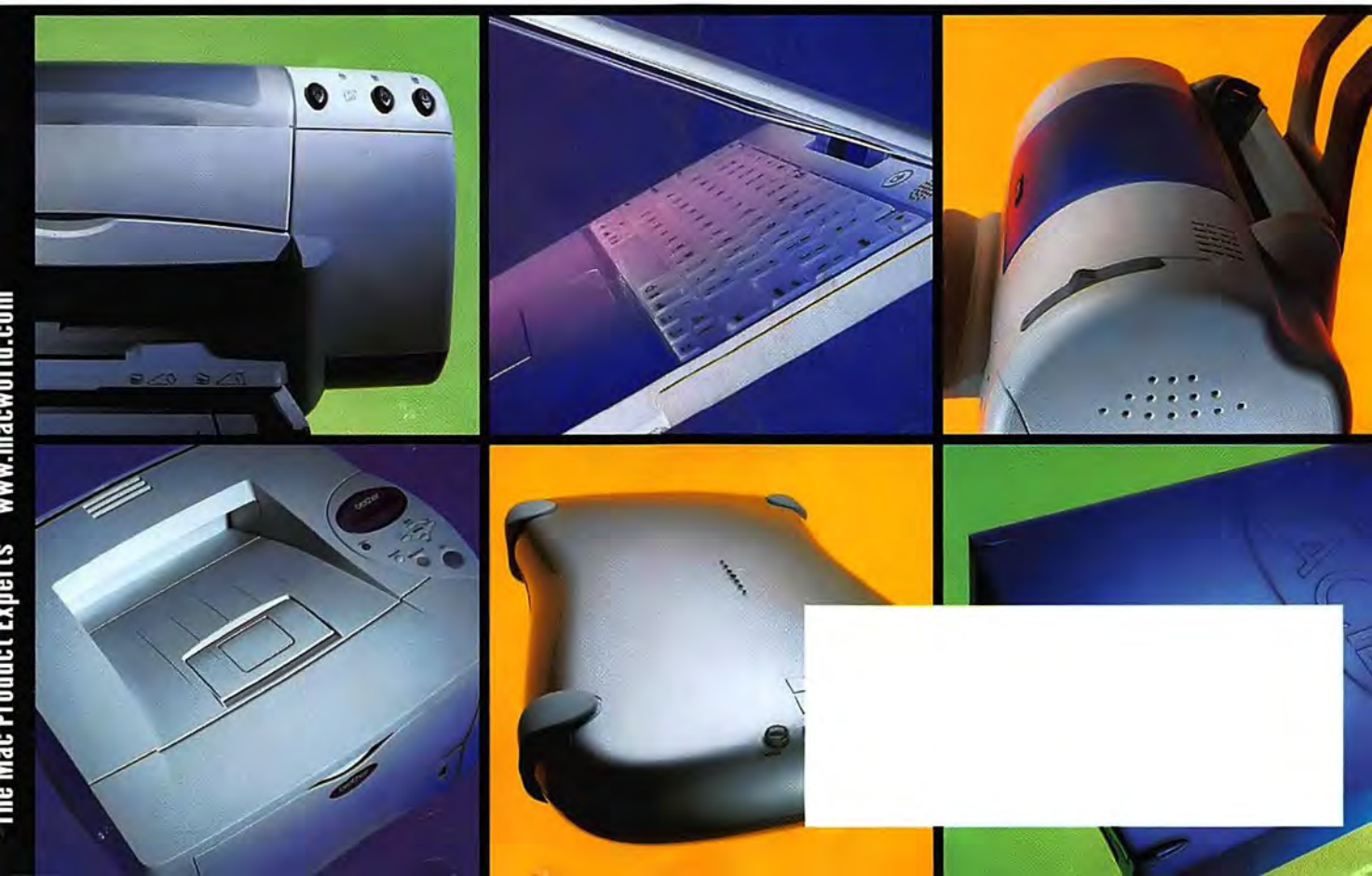
10 FireWire CD-RW Drives ▪ Adobe After Effects and Photoshop Elements



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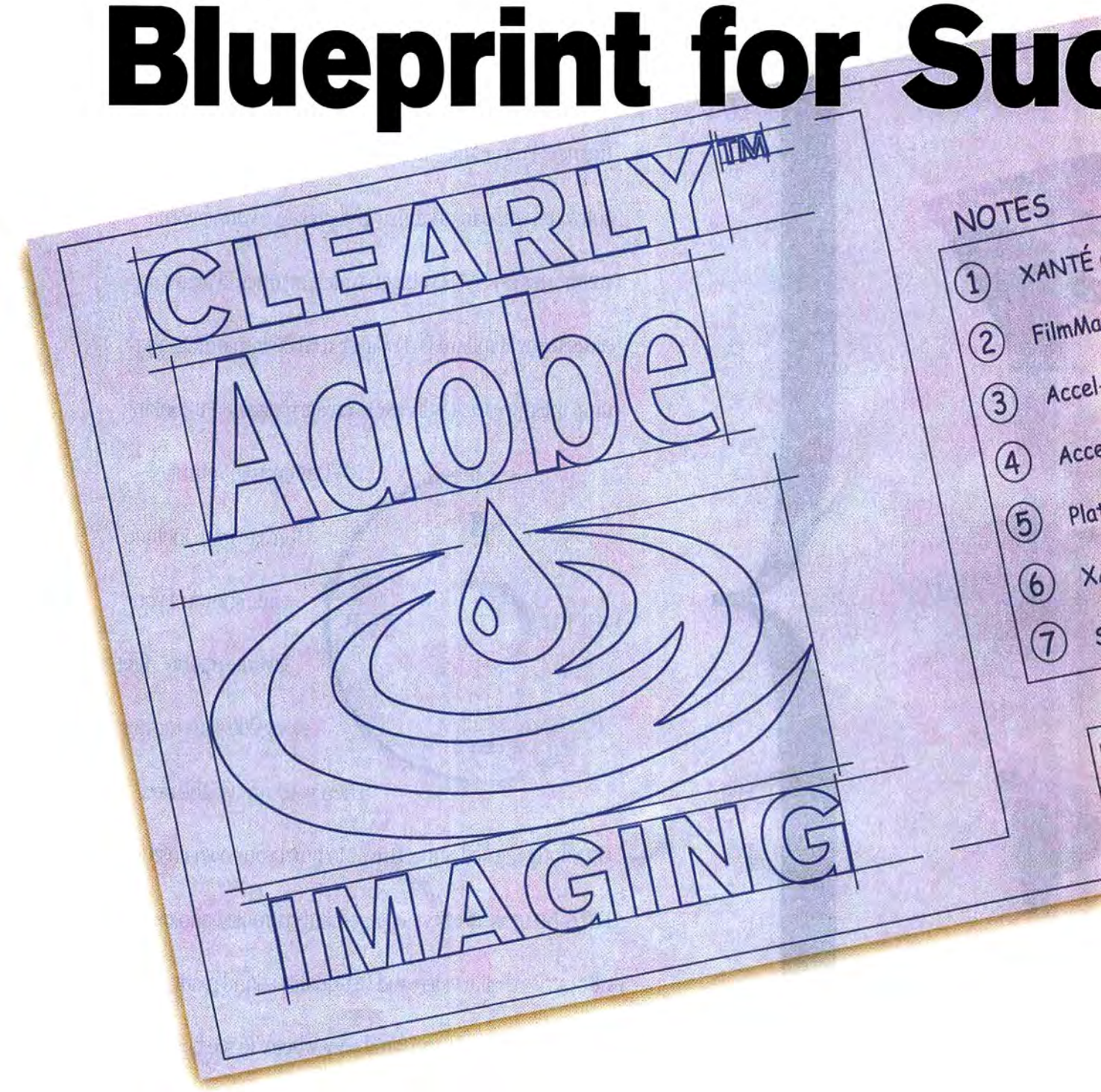

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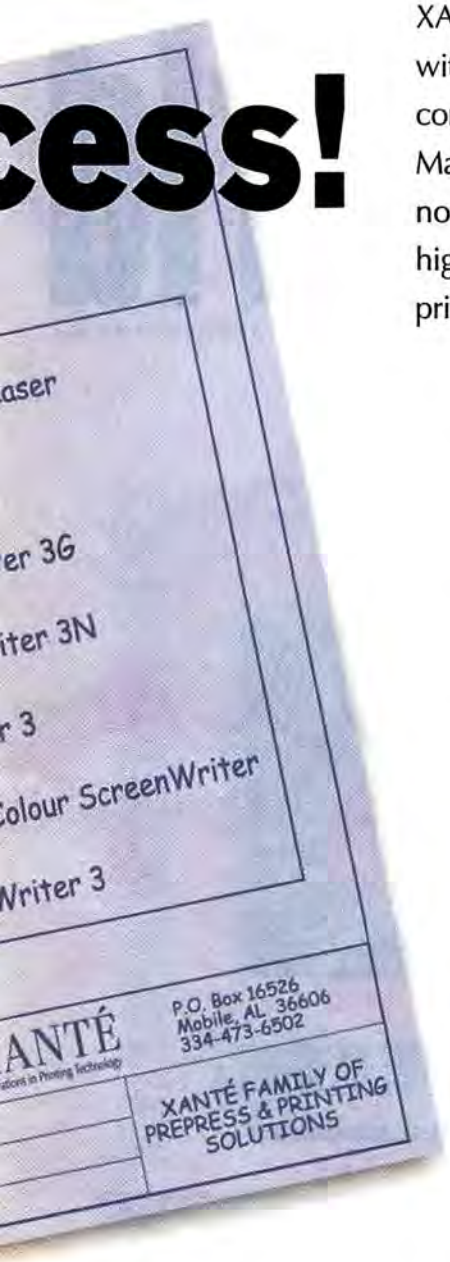

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August 2001

Macworld

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Incorporating MacUser

Opinion

11 The Vision Thing
ANDREW GORE A new OS from Apple means new mouse ratings from *Macworld*.

17 Forums and Feedback
Readers respond.

43 The Game Room
PETER COHEN Like its predecessors, Myst III: Exile will keep you guessing.

140 Ihnatko
ANDY IHNATKO Bluetooth could change the way we live and work—but is Apple interested?

Buzz

18 The Apple-Motorola-IBM alliance, Olympus's PT-002 waterproof camera case, GPS devices, and Dr. Mae Jemison.

How-to

70 Think Outside the Picture Box
DAVID BLATNER Use QuarkXPress clipping paths to take images beyond the expected.

77 Web Publishing Secrets
DAVID SAWYER MCFARLAND Macromedia Dreamweaver's Find And Replace feature makes updating Web sites a snap.

81 Print Publishing Secrets
DAVID BLATNER Learn how to avoid common—and costly—printing mistakes.

85 Mac OS X Secrets
GREG KNAUSS Use the powerful Apache Web server to build and run a Web site.

88 Mac 911
CHRISTOPHER BREEN Get sound into Macs without an audio-input port, import and export database information, decide whether you need a firewall, and preserve system settings in multiuser environments.

Old Mac, New Tricks

ADAM C. ENGST You don't need to use a fancy new Mac to listen to your enormous collection of MP3 files. We'll show you how to update your hardware, create playlists, and turn your older Power Mac into an MP3 jukebox.

64

On the Cover

Photographs by Kevin Twomey

Macworld's Ultimate Buyers' Guide: Printers
BRUCE FRASER With the variety of printers available today, it's hard to know which one is right for your small business or home office. To help you decide, Macworld Lab put 20 printers to the test.

46

Stand by Your CPU
Despite the *megahertz gap*, IBM and Motorola are good for Apple.

18

The IceBook Cometh
ANDREW GORE Read our review of Apple's new iBooks, and find out if one of them will be your portable of choice.

24

Macworld.com
Stay abreast of the latest Mac OS X coverage, learn more about portable Macs in our forums, and find new uses for older Macs—only on Macworld.com.

Reviews

24 Consumer portables
- ♦♦♦♦ iBook with CD-ROM drive
- ♦♦♦♦½ iBook with Combo drive
- ♦♦♦♦½ iBook with DVD-ROM drive

26 Video-effects software
- ♦♦♦♦ After Effects 5.0

28 FireWire CD-RW drives
- ♦♦♦ Acomdata FireWire CD-Rewritable Drive
- ♦♦♦ CD CyClone CDRevo
- ♦♦♦♦ ClubMac FireWire 16×/10×/40×
- ♦♦♦½ EZQuest Boa CDR/W 16×10×40 FireWire External
- ♦♦♦½ FireWireDirect.com FireCD 16×10×40 Yamaha
- ♦♦♦½ Formac cdrw 16/10/40
- ♦♦♦♦ LaCie 16×10×40× U&I
- ♦♦♦½ MadLogix Alien 16×10×40 External FireWire
- ♦♦♦½ QPS Que Fire CD-RW 16×10×40 External
- ♦♦♦ Yamaha LightSpeed CD-RW Recorder CRW2100FXZ

30 Analog-to-DV converters
- ♦♦♦½ Dazzle Multimedia Hollywood DV-Bridge
- ♦♦♦♦ Formac Studio
- ♦♦♦½ Power R Director's Cut
- ♦♦♦ Sony DVMC-DA2 Media Converter

32 Image editor
- ♦♦♦♦½ Adobe Photoshop Elements

34 3-D-modeling software
- ♦♦♦♦½ LightWave 6.5

36 Programming tool
- ♦♦♦♦ RealBasic 3.2

38 Document-revision utility
- ♦♦♦½ Voodoo Personal 2.0

39 Word processor for QuarkXPress
- ♦♦♦ QuarkCopyDesk SE 2.0

40 Asset-management software
- ♦♦♦♦½ iView MediaPro

40 Digital-imaging hardware
- ♦♦½ Iomega FotoShow

41 More reviews online
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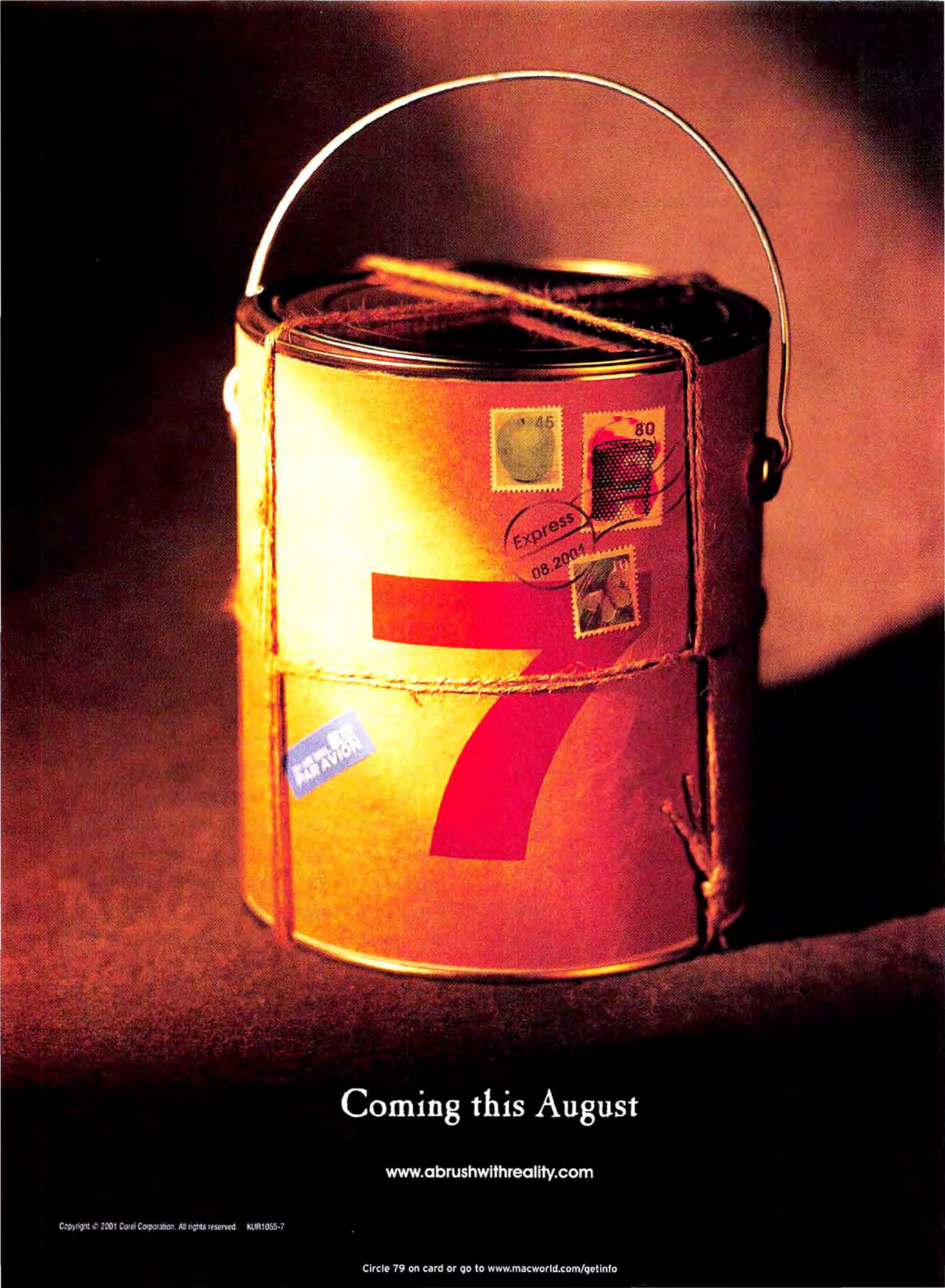

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ANDREW GORE

The Blue Mouse Cometh

An Icon of a Different Color Illustrates Our Commitment to Mac OS X

THE MOUSE RATING IS, IN a very real sense, what *Macworld* is all about. It's the distillation into a single icon of what we do best: help users make the smartest Mac investments, and then help them get the most out of those investments.

That's why, by the end of this year, *Macworld* will stop using performance under Mac OS 9 as the basis for all of its ratings and lab tests. Come the end of 2001, all products that *Macworld* evaluates will be judged by how well they operate in Mac OS X, either natively or in the Classic environment. Software or hardware that does not support OS X at least in Classic mode will not be rated (although it may still be covered otherwise by the magazine).

The reason is simple: with the Mac world starting a tumultuous transition to Mac OS X, there has never been as great a need for objective, accurate, definitive purchasing advice. The danger of making costly mistakes is greater now than it's been in years. And while the stakes are high, the costs of not making the switch are even higher. That's why we at *Macworld* have chosen to put 100 percent of our resources and expertise into helping to make this transition as smooth as possible for our readers.

Even if we have to twist a few arms along the way.

The Mouse That Roared

Changing our ratings basis from OS 9 to OS X was inevitable. Apple has made it clear: the Mac is moving to OS X—as quickly as possible. Mac OS X is already included on every new Mac's hard drive. Soon when you start up that brand-new Mac, it'll be OS X's Aqua interface and not OS 9's Platinum look and feel that greets you.

And while Apple is moving fast, so are our readers. According to a recent survey of *Macworld* subscribers, 68 percent of you will have OS X by summer. Most Mac applications aren't available in native OS X versions, but the bulk will run in Classic. How *well* they run is open to debate.

Apple has put a lot of pressure on Mac software developers. Its past two Worldwide Developers' Conferences were spent convincing them of the vital need for them to move their applications to OS X. Which only makes sense: Mac users will be more inclined to make the transition if their favorite programs are available on the other side of the great divide.

By deciding to stop rating products based on Mac OS 9, *Macworld* is putting pressure on those developers, too. We hope it will be an added incentive for them to get their OS X products right the first time. And, in turn, the developers will have an interest in ensuring that Apple continues to improve Mac OS X, making it a more stable platform on which to build great software.

But we're not pressuring Mac developers just because Apple is. Every Mac user who is considering the jump to Mac OS X needs to know how well the latest products work on this new operating system. Those who've already made the transition will also be hungry for that information. They'll be able to get it from us.

Surely, some Mac developers will be unhappy about our decision. Most are still trying to sort out their OS X development plans; others are working hard to make their programs OS X native. That's why we're announcing this change so far in advance: to give fair warning.

The slow pace of progress by many developers toward OS X compatibility is not entirely their fault. Some admit dragging their feet because of doubts about the new operating system and the continued viability of the Mac itself. But other developers tell us they don't have all the tools they need to successfully move to OS X. Apple's making progress, they say, but key components of the operating system and development environments are still lacking.

I hope our move will help developers pressure Apple to ensure that they have what they need to make great OS X products. After all, Apple doesn't want to see a raft of poorly rated products—or worse, none at all—in *Macworld*'s end-of-year issue either.

Whither OS 9?

Readers will be able to tell from a simple visual cue when we start using Mac OS X to evaluate products: our mouse-rating icons will change color, from red to

continues

blue. This should also benefit developers, who'll be able to put those same blue mice on their product packaging, declaring that their products run on OS X, and just how well they run.

But our move to base mouse ratings on Mac OS X doesn't mean we'll be ignoring how products work in OS 9. As long as the Mac's most active communities continue to use the classic Mac OS, we'll be vigilant about Mac OS 9 performance. In the text of our reviews, we'll still let you know how well each product works in OS 9.

Nor will Mac OS 9 rapidly become OS non grata in our magazine. Our how-to and feature articles will continue to address the hardware and software you're using now. (Of course, the *Mac OS X Secrets* column we began in our July issue will always explore the technical side of the new Mac platform.)

Debuting this month are two new columns, *Web Publishing Secrets* and *Print Publishing Secrets*. Both will focus predominantly on Mac OS 9 for some time to come. Even after the mission-critical applications of the publishing world have moved over to Mac OS X, there will be the matter of custom AppleScripts, application plug-ins, and other essential cogs found in any pro publishing setup. For this reason, publishing professionals may be loath to chuck a system that works and move to a new operating system right away.

For them, *Macworld* will continue providing tips, tricks, shortcuts, and other useful advice—and we'll also monitor the Mac market's progress toward the day when professional publishers can confidently make the transition to Mac OS X.

Expert Buying Advice

Another feature that's new this month is our "Ultimate Buyers' Guide" series. Scheduled to appear quarterly, the articles in this series are comprehensive guides to buying essential Macintosh add-ons such as printers, digital cameras, monitors, and storage devices.

The guides will feature reviews based on comprehensive lab testing (this month we evaluate 20 ink-jet and monochrome laser printers). But in addition to giving you a list of the best current products, we'll teach you how to shop for the products in the future. Each guide will explain in detail the various features found in different product categories, so you can make good choices based on what *you* need.

The buyers' guides will follow along when *Macworld* switches the basis of its mouse ratings to OS X. The next guide, scheduled for our November issue, will use OS 9 in an evaluation of digital cameras. But the guide after that, planned for February 2002, should feature product reviews based on their performance in Mac OS X.

Macworld Recommends

Apple took a bold step, replacing the entire foundation of 17 years of success with something we all hope will be better. It was time for something new. Mac users have been demanding a robust, modern OS for more than a decade.

Well, now we have one. But if the people who make Mac hardware and software don't put maximum effort into bringing top-notch products to Mac OS X, Apple's Herculean efforts to build this radical new operating system will be for naught.

So we're putting our mouse ratings where our mouth is: strongly behind the migration to Mac OS X. Our readers will need reliable tests and ratings to help them safely bridge the chasm between platforms, and only through that transition will the Mac platform continue to grow and improve. **m**

ANDREW GORE is *Macworld*'s editor in chief. To comment on this column, visit our Columnists forum (type **Vision Thing** in Macworld.com's Search box).

CORRECTION

The "Speed Racer" illustration in "Does MHz Matter?" (July 2001) was created by Terry Paczko.

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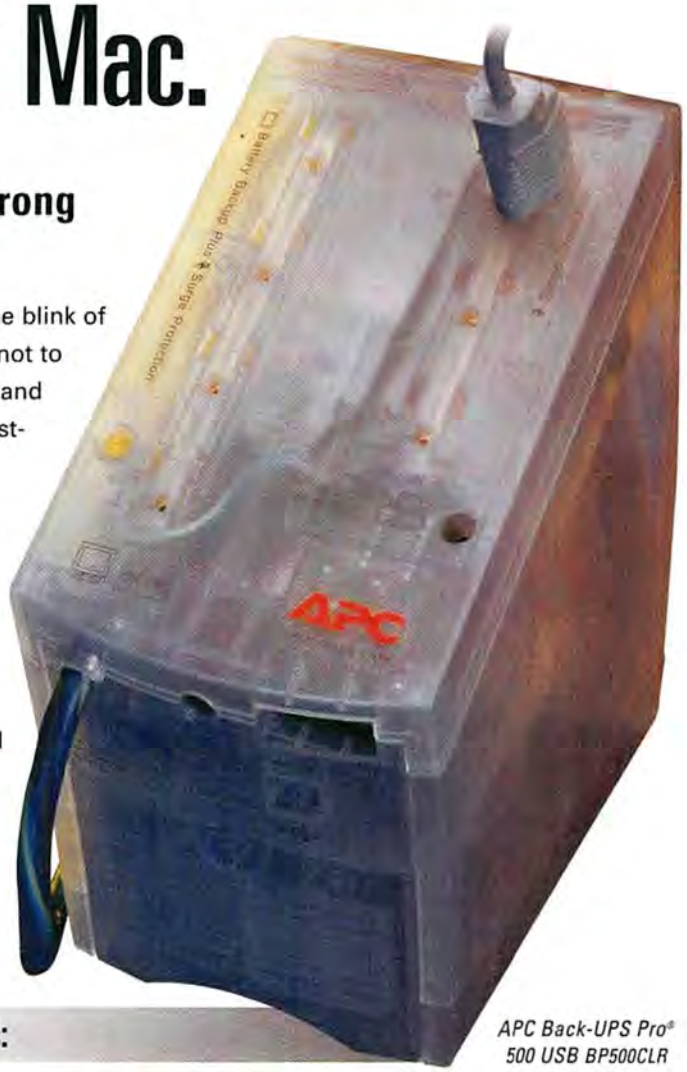

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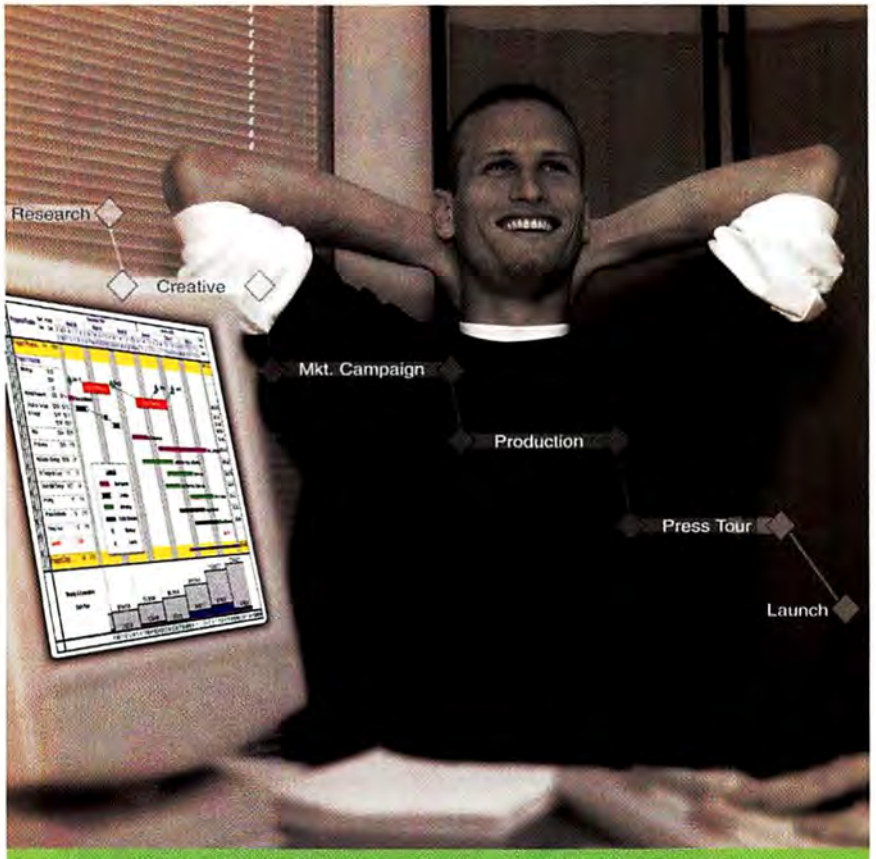

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BPA

Forums and Feedback

Restart

The Macintosh universe is all about beginnings this month, whether it's the launch of a sleek new iBook, the early days of a next-generation operating system—or the redesign of *Macworld*'s *Feedback* section. We are now including posts from the Macworld.com forums beside your letters and e-mail. The result will be either "übercool," as one forum poster described the Titanium PowerBook G4, or "definitely still a beta," as another reader wrote of Mac OS X. Either way, we're sure you'll let us know—starting now. **m**

The Silver Surfer

DR. JOHN TILELLI There are a few blemishes that I believe keep this beauty from perfection ("Inside the Titanium PowerBook G4," May 2001): The aspect ratio of the screen, albeit cool and attention getting, is unconventional; much of the time, it adds little to the task at hand. Anything you put in the DVD drive can rub against the case and self-destruct with only a little rustle of the computer. And I think it's really bad form to put a memory slot under the keyboard and then not have the motherboard recognize that RAM is there when you install it. Sometimes I notice the battery dropping out of the case, killing the machine while I'm working. I use a piece of duct tape for insurance.

ROB POYNTER As much as I enjoyed getting inside the new PowerBook, it seems to me that the battery and DVD-ROM drive have somehow switched places on your cover.

Smash or Trash?

JEFF PERRIN Who's the brainiac who thought it'd be cool to trash an iBook for a corny half-page article ("dieBook," *Buzz*, May 2001)?

SHANE MASSEY There's a difference between simulating "real-world" abuse and what was done in the piece.

Oh-oh, Canada

STEPHEN POLLARD This is probably Letter No. 2,794 on this subject, but the residents of Pelee Island (Canada's southernmost point) were probably surprised to read that Race Rocks is farther south ("QuickTime Conservation," *Buzz*, May 2001). It may be British Columbia's southernmost point, but it's not Canada's.

It's Letter No. 2,975, actually. And yes, we goofed.—Ed.

Home Sweet Home?

MARK WHEELER While it's true that the built-in Ethernet on Macs takes advantage of hardware you have already purchased, Michael Penwarden failed to take the value of time into account ("Your High-Tech Home," May 2001). By the time you've spent several weekends cutting holes in drywall, drilling baseboards, stringing wire in crawl spaces, and making several trips for the proper tools, cabling, and adapters, you've made a large investment of time (and perhaps money) in your installed Ethernet network.

LOREN JENKS I realize that retro is in, but the uncanny resemblance between the May 2001 issue of *Macworld* and, say, a 1957 issue of *Popular Science* is unnerving. Dates and technological details aside, the articles and illustrations are almost interchangeable.

Top X List

JON SILVERS I was really looking forward to OS X, but I've found that it's incredibly slow, it takes forever and a day to launch Classic apps, and navigation makes no sense.

JULIE KHANER I don't agree with you at all. I am really enjoying OS X (except for Classic). I expect it to improve, and I don't want to go back.

JEFFREY CHAPMAN Much of OS X is indeed "un-Mac-like," but that's the price of progress. You can't expect to have change and yet have everything be the same.

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STAND BY YOUR CPU

APPLE PRAISES IBM AND MOTOROLA, BUT COULD ALLIANCE SOUR?

NAOMI SHEA

Buzz

News, Views, and Chatter from the World of Macs

APPLE EXECUTIVES HAD JUST opened the floor to questions after showing off Mac OS X at a March preview, when a reporter wanted to know about the processors that power the Mac. With only Motorola and IBM producing PowerPC chips, the reporter asked, wasn't Apple becoming too reliant on those two companies? The response from Apple CEO Steve Jobs was swift and merciless: "You don't know what you're talking about."

Indeed, the Apple-Motorola-IBM relationship—forged when the three companies developed the PowerPC chip a decade ago—doesn't show any signs of strain. IBM calls Apple one of its best customers, Apple publicly professes appreciation for its suppliers, and Motorola is just as effusive.

"In the computing space, Apple is one of our oldest and most strategic customers," comments Motorola Director of Communications William A. Swearingen.

Where Did Our Love Go?

If only all Mac users shared that love. IBM and Motorola take more than their share of flak from Mac users, mostly because of the megahertz gap between PowerPC chips and processors from Intel and AMD.

Whether Intel's Pentium chip is faster than a PowerPC is debatable (see "More Than Just Megahertz," *Buzz*, July 2001), but it's certainly a marketing nightmare for Apple. You can talk about gigaflops and dual-processor systems, but in the end casual computer shoppers are likely to gravitate toward the machine with the higher megahertz rating.

Add to this the fact that Motorola and IBM also sell the PowerPC as an *embedded processor*, a chip that runs consumer electronic devices at a set power level. Faster clock speeds aren't a priority for these devices; embedded chips just have to keep an appliance running. After all, you didn't buy your VCR because its processor is faster than a rival brand's.

The faster clock speeds Mac users crave are not necessarily a high priority for the PowerPC's manufacturers, because IBM and Motorola sell far more PowerPC chips to the embedded processor market than to Apple. Therefore, neither company is likely to change the chip's design just for Apple's sake. That has critics fuming that IBM and Motorola care more about developing the PowerPC for embedded uses than about meeting Apple's desktop needs.

Which is nonsense, according to Motorola's Swearingen. "The perception that development in embedded PowerPCs is contrary to [advances in] desktop PowerPCs is wrong," he says. "In fact, it's the opposite. The embedded market fuels desktop development."

AltiVec Inside?

There are other potential friction points. Motorola and Apple have embraced AltiVec as a way to get better 3-D, multimedia, and design performance. IBM hasn't.

IBM plans to add Single Instruction Multiple Data (SIMD) support to future PowerPCs. SIMD resembles AltiVec in that it allows more-efficient processing of complex redundant data. IBM's take on it could be different; nevertheless, IBM continues to show no interest in AltiVec.

Still, the AltiVec schism between IBM and Motorola may not necessarily be a bad thing, at least from Apple's perspective. If the chip makers take the PowerPC in different directions, Apple could enjoy the choices that two different suppliers would have to offer.

So don't look for Apple to ditch IBM or Motorola anytime soon. Apart from the companies' longstanding relationship, the PowerPC is one of few viable alternatives to X86 processors such as the Pentium. Dropping the PowerPC would cost Apple a great selling point: originality.—DAVID READ

ENERGY CRUNCH

POWER MACS

The power crisis hitting California is spreading to other Western states and threatening to become a national problem. Power prices, which are tied to natural-gas costs, are on the rise across the country. So people are on the lookout for ways to knock down some of those higher digits appearing on their bills.

They could start by buying a Mac.

In general, the Mac is a more energy-efficient machine than many Wintel PCs (see "Power Facts"). In an eight-hour day, a business with 50 733MHz Power Mac G4s is going to consume fewer watts than a company with 50 Pentium 4-powered Wintel machines, up to 19,600 fewer watts if you assume that the chips are at the high end of their average consumption range.

Mac users have other ways to cut electric costs, says Thomas R. Schneider, the Consumer Energy Counsel of America's vice president of policy and chief technical officer, and chairman of the Energy Policy Committee for the IEEE USA (Institute of Electrical and Electronics Engineers): make sure all their peripherals are Energy Star compliant (they'll sport an identifying label) and run them in power-saving mode.

Schneider also recommends switching things off instead of letting them sleep. The idea that devices consume more power when they're being switched on and off than they do when they're sleeping is a common misconception.

More Info: www.lbl.gov

Need power-saving tips and advice? Check out Lawrence Berkeley National Laboratory's Web site.

LINK

"When you go out for the evening, turn off your devices at the power strip," Schneider says. "Your monitor consumes energy even in the off mode." That stops electronic devices from "leaking" electricity—consuming small amounts of power even while off so that they can power on quickly.—MATHEW HONAN

POWER FACTS

■ **Apple ships products with power management enabled.** Windows machines often require users to turn those features on. While many PC users know that, some do not, and others simply won't bother with changing anything.

■ **Newer Macs in sleep mode significantly beat the government's Energy Star requirements.** To be Energy Star compliant (meeting certain energy-efficiency standards) a system must use 25 watts or fewer per hour while in sleep mode, among other things. A 733MHz Power Mac G4, in contrast, uses only 13.7 watts. And shutting the machine down entirely saves an additional 4.1 watts—maybe not much for individuals, but it could mean significant savings for networks.

■ **The G4 chip consumes less power than a Pentium 4.** Take the PowerPC 7410 used in 733MHz Power Mac G4s: it uses 12 to 15 watts in average-consumption mode. Run processor-intensive tasks in Adobe Photoshop, and consumption rises to about 30 watts. A Pentium 4 consumes from 49 to 64 watts during average use.

COOL STUFF

DAVID PAPAS

The Camera and the Deep Blue Sea

Digital-camera makers have boosted resolutions, shrunk sizes, and squeezed a bevy of features into their products. But they still haven't figured out a way to make their cameras waterproof. Digital circuitry, it seems, does not respond well when introduced to water. Until it does, there's always the PT-002 protective case from Olympus ($130; 800/645-8130, www.olympusamerica.com). Just 14.5 ounces of transparent polycarbonate, the casing keeps your Olympus digital camera high and dry when you take it onto the ski slopes, out to the beach, or into the briny deep. The PT-002 casing is compatible with four Olympus models—the D-220L, D-320L, D-340L&R, and D-360L—and is waterproof to a depth of three meters. A $30 maintenance kit gives you some silica gel packets and extra O-rings to keep the PT-002 watertight. When you bring your $400 digital camera on a snorkeling excursion, the last thing you want it to be is all wet.—PHILIP MICHAELS

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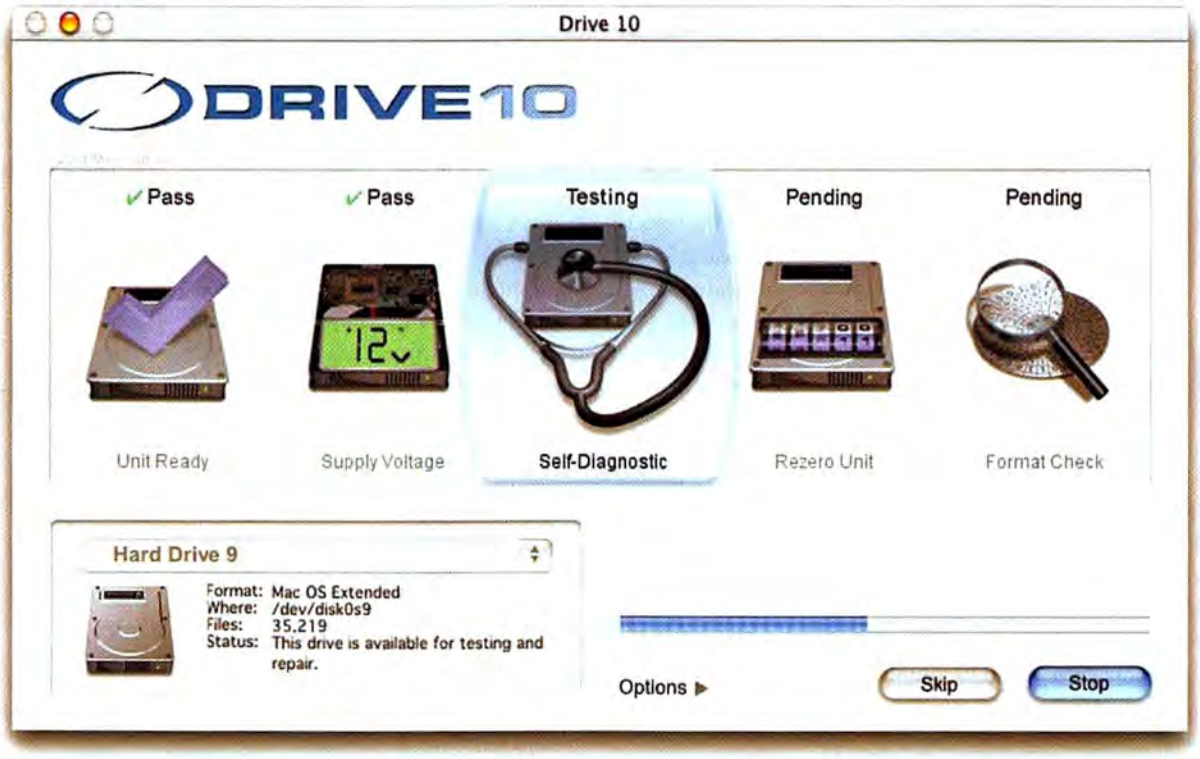

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PRO FILE

Science Fact

Q&A with DR. MAE JEMISON

Dr. Mae Jemison has a ride aboard a space shuttle on her resume. But among her interests these days is The Earth We Share, a program that promotes basic science literacy—with some help from the Mac.—ADELIA CELLINI

Q: ***Explain The Earth We Share.***

A: It was started in 1994, and its goal was to build a science literacy curriculum that was experiential in nature. I believe that the most important thing one gets from a science education is the ability to critically assess things and problem-solving skills. We wanted to create this program for 12- to 16-year-olds.

Q: ***How do Macs figure into your work?***

A: We used iMovie to create our trailers for The Earth We Share. I also made an iMovie that used to be on the Apple-Masters Web site. Also, eight student winners of an international essay contest in connection with The Earth We Share program went out for a day of adventure. We used iMovie to make two-minute blurbs about their experiences. And of course, I do presentations on Macs as well.

More Info: www.macworld.com/2001/08/buzz/jemison.html

What's the view like from space? Dr. Jemison talks about her mission aboard the *Endeavor* in an extended interview on Macworld.com.

LINK

GPS SHOWDOWN

OFF THE MAP

Maybe it's because the government stopped degrading the accuracy of its Global Positioning System. Maybe it's because prices of satellite-delivered navigational tools have fallen. Whatever the reason, GPS devices are everywhere—in cars, attached to handheld PDAs, and in your Mac.

But how good are GPS devices at getting you from point A to point B? To find out, we put three devices to the test on the wild, untamed streets of San Francisco.

Our experiment included a DeLorme Earthmate, a GeoDiscovery Geode, and a Nexian HandyGPS module. And just to see how GPS technology stacked up against a low-tech alternative, we also tested a simple folding map. Our four contestants set out from a common point to find a fixed set of latitudinal and longitudinal coordinates (or a street address, in the case of our map-wielding participant).

The verdict? GPS devices are great for finding obscure trailheads and out-of-the-way fishing holes—but in a race against time on city streets, never bet against the person with a map.—MATHEW HONAN

Any Which Way You Can

COMPANY	PRODUCT	PRICE	CONTACT	TIME	COMMENTS
DeLorme	Earthmate	$157	800/561-5104, www.delorme.com	27 minutes	"You could definitely use the Earthmate in a pinch. Once you get a fix, it works well. The mapping software it came with was more useful."—*Mathew Honan*
GeoDiscovery	Geode	$289	888/206-6444, www.geodiscovery.com	15 minutes	"The Geode was pretty straightforward. I'd still want a map on hand. Maps don't need batteries."—*Adrienne Robillard*
Nexian	HandyGPS	$149	858/623-1550, www.nexian.com	never*	"Using the HandyGPS was frustrating; sometimes it didn't see a satellite. You have to hold the (PDA) up in the air, which can make people stare."—*David Weiss*
Mapgroup International	San Francisco Pop Out Map	$5	800/617-6768, www.mapgroup.com	8 minutes	"I had more trouble folding the map than I did using it to find my location. I did worry that young toughs would mistake me for a tourist."—*Philip Michaels*

* Try as he might, Weiss never got a fix on the satellite and was unable to reach the finish line.

ILLUSTRATION BY STUART BRADFORD

Product Watch

Adobe Offers InDesign Sneak Preview

Adobe hasn't even announced a new version of InDesign, let alone a shipping date. But that's not stopping the company from showing off several features it plans to include in future versions of the page-layout application. And Adobe plans on Carbonizing the next major InDesign update, so it will run in Mac OS X. The coming additions—from transparency and table tools, to a redesigned Print dialog box—may please even InDesign critics.—DAVID BLATNER

- **OBJECT TRANSPARENCY**
  The most impressive addition lets you change the opacity of anything on your page—text, boxes, or pictures—just as you can in Photoshop and Illustrator 9. InDesign will also add a Feather feature that will soften edges and recognize transparency in Photoshop files, which means you may no longer need to make clipping paths.

- **LONG-DOCUMENT FEATURES**
  These include indexing, table-of-contents, and multiple-document "book" tools. The next version of InDesign will build a table of contents based on style sheets in a document and automatically create hyperlinks when you export a PDF file. InDesign will include a Hyperlinks palette to add additional hot links in your documents that will function in exported PDF and HTML files.

- **TABLE-MAKING TOOL**
  Adobe hasn't revealed very much, but the company does promise that this oft requested feature will come to InDesign. When it does, the program will be able to import XML from a database (or tab-delimited text from a Microsoft Excel document) into a table, where it will be automatically formatted. The table can dynamically grow to fit the text—and if there's more information than can fit onto one page, InDesign will let you link table data across page breaks.

- **XML IMPORT AND EXPORT**
  Adobe says all its products will be XML aware, including InDesign. This means you'll be able to import and export document content by tagging the content's structure instead of tagging what the content should look like.

HARDWARE

DIGITAL CAMERAS

- **The PowerShot S110,** a 2.1-megapixel camera designed by Canon ($599; 800/652-2666, www.usa.canon.com): The next-generation digital Elph model, it features 2× zoom, support for QuickTime AVI files, and adjustable resolution from 1,600 by 1,200, to 640 by 480 pixels.
- Four cameras from Olympus America (800/622-6372, www.olympusamerica.com): The **Brio D-100** ($299) is a 1.3-megapixel camera with 1,280-by-960-pixel resolution and a 2× digital zoom. The **Camedia D-510 Zoom** ($400) is a 2.1-megapixel camera with a maximum resolution of 1,600 by 1,200 pixels and a 3× optical, 9× digital zoom. The **Camedia Brio Zoom D-150** ($450) is a 1.3-megapixel camera with adjustable resolution—from 1,280 by 960, to 640 by 480 pixels. The **Camedia C-700 Ultra-Zoom** ($699) is a 2.1-megapixel camera with a 10× optical, 27× digital zoom.

DISPLAYS

- The 17-inch flat-panel **Apple Studio Display** ($999; 800/692-7753, www.apple.com): The monitor, which uses only a single power cable, features a resolution of 1,280 by 1,024 pixels, 16.7 million colors, a 160-degree viewing angle, and two built-in USB hubs. Apple also announced it will now sell only LCD monitors, dropping its CRT displays.

PRINTERS

- Eight monochrome laser and multifunction printers from Lexmark (888/539-6275, www.lexmark.com): The **Lexmark W820** ($2,899 to $3,999) is a 45-pages-per-minute (ppm), high-volume laser printer for large workgroups. The **Lexmark T622** ($1,699 to $2,199) and **T620** ($1,099 to $1,699) have print speeds of 40 ppm and 30 ppm, respectively, for large and medium workgroups. The **Lexmark T522** ($899 to $1,549) and **T520** ($699 to $1,129) print at 25 ppm and 20 ppm, respectively. The **Lexmark X522 MFP** ($3,649) and **X520 MFP**

MAC STUFF

Of Mice and Men

Before the $70 Cordless MouseMan Optical, from Logitech (800/231-7717, www.logitech.com), scurried onto the scene, no mouse had successfully mixed wireless and optical technologies. The farmer's wife might have lopped off its tail, but the MouseMan is anything but blind—it takes pictures with an 800-dpi sensor, saving you from wires, balls, and pads. It runs on a frequency of 27MHz, rather than 900MHz, so it's less likely to run into interference from other cordless devices around the office. AA batteries, a battery-life display, and power-management features from Agilent Technologies mean the MouseMan won't conk out on you unexpectedly. Go ahead: see how it runs.—MATHEW HONAN

PHOTOGRAPH BY JIM HILDRETH; ILLUSTRATIONS BY MARK MATCHO

What's HOT

A QUICK LOOK AT THE WORLD OF TECH

1. **A Mac "Genius Bar" is among the highlights of new Apple Stores.** *Plan to feature "Evil Genius Bars" scrapped after staff's repeated attempts at world domination are foiled by meddlesome Hall of Justice.*
2. **AOL hikes its monthly unlimited-service fee to $23.90.** *The $1.95 increase covers the rising costs of infrastructure, technical support, and flooding your mailbox with spam.*
3. **Apple touts redesigned, 4.9-pound iBook as the ideal portable for students.** *But after one semester away at college, it comes home weighing an extra 15 pounds.*

($1,999) multifunction printers offer copying, faxing, and scanning capabilities. The **Lexmark X720 MFP** ($4,699) does color printing, copying, network scanning, and faxing.

- Samsung's **ML-1210** laser printer ($199; 888/887-8536, www.samsungusa.com): Targeting small businesses and home offices, it has a speed of 12 ppm.

SOFTWARE

DESIGN SOFTWARE

- **Adobe PageMaker 7.0** (800/833-6687, www.adobe.com): The publishing software now allows users to merge text and graphics exported from database and spreadsheet applications. A new Place PDF command puts PDF files created by Photoshop and InDesign inside of PageMaker documents. The application can create tagged PDF files in which the contents are reflowable, accessible, and easy to extract ($499; upgrade, $79).
- **BBEdit 6.1**, from Bare Bones Software (781/687-0700, www.barebones.com): The updated HTML and text editor now runs natively in OS X ($119; upgrade, $39).

PRODUCTIVITY SOFTWARE

- **FileMaker Pro 5.5** (800/325-2747, www.filemaker.com): The database application has been rewritten to run natively in Mac OS X, with enhanced support for ODBC-compliant databases and a revamped Instant Web Publishing feature ($249; upgrade, $149).

SYSTEM SOFTWARE

- Symantec (800/441-7234, www.symantec.com) utilities updated to run on Mac OS X: **Norton AntiVirus 7.0.2** has been Carbonized to allow for manual scanning and repairing viruses in the native layer of OS X. Features such as autoprotect, simplified preferences, and e-mail scanning work only in the Classic layer of the OS. **Norton Personal Firewall 1.0.2** retains most of its features running natively in OS X, with the exception of control-strip access. At this time, **Norton Utilities** won't run natively in OS X, but version **6.0.2** improves compatibility with OS X when running the software from a bootable CD. Users can get the updates via each product's Live Update feature. Customers who bought Norton products last fall can order a $15 replacement CD.

ANNOUNCED

- The discontinuation of Casady & Greene's **SoundJam MP** (800/359-4920, www.casadyg.com): At the request of the MP3 application's developers, the publisher will continue to offer technical support for SoundJam. Apple bought the program from the developers last year and will now focus on developing its iTunes, an MP3 application that has many of SoundJam's features.

—Compiled by PHILIP MICHAELS

SOFTWARE UPDATES

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Adobe Acrobat eBook Reader 2.1
Reader for eBook format

America Online 4F
Beta Mac OS X client for online service

Analog 5.0.1
Web-server-log analysis tool

Apple CarbonLib 1.3.1
Update for Carbon-based apps

Apple Open Transport 2.7.6
Networking components for OS 9.1

Autodessys formZ 3.8
3-D-modeling program update

Extension Overload 5.8.3
Extension and control-panel tool

FontAgent 8.2
Enhanced font validation

HP Precision Scan 3.0.1
Supports ScanJet 5300c, 5370c, and 6300c scanners

ICQ 2.6a29
Chat and messaging client

IomegaWare 3.0
Zip and Jaz drivers and software tools

LaCie Silverlining Pro 6.4.2
Updated tool for testing, partitioning media

Linksys 8-port cable and DSL router 2.38.1
Firmware for BEFSR81 router

LiveStage Pro 3.0
QuickTime 5 interactive authoring environment

Metrowerks CodeWarrior Pro 6.2
Maintenance update for development software

Microsoft Internet Explorer X 5.1.1
Public preview of Web browser for Mac OS X

MindVision Installer VISE 7.3
Developer software-installation tools

OmniWeb 4.0.1
Web browser for Mac OS X

Poser Pro SR1
Service update, plug-in support for animation tool

Resorcerer 2.4
Resource and data-file editor

Rio 800 1.56
Firmware update for MP3 player

ScheduleOnline Mac Sync 1.4
Palm conduit for ScheduleOnline's Web tools

TechTracker Pro for OS X 1.2
Carbon version of software-update client

Virex Command Line Scanner 7.0b2
Beta virus-protection program for Mac OS X

For these and other current updates, visit:

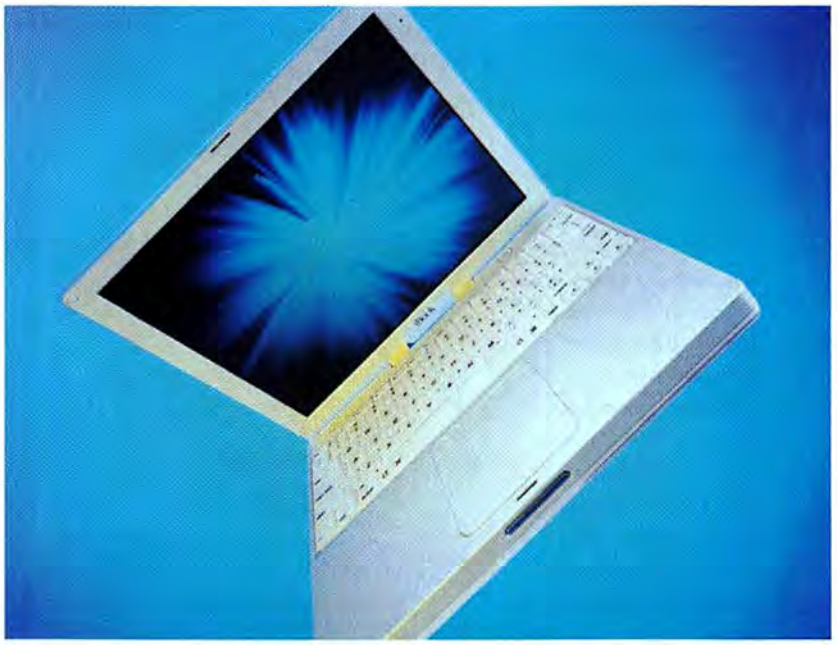
www.macworld.com/subject/updates

LINK

iBooks

Consumer Portables Break Barriers in Price, Features, Excitement

BY ANDREW GORE



DAVID PAPAS

iBOOK WITH CD-ROM DRIVE

Rating: ♦♦♦♦

Pros: Lightweight; elegant design; full set of features; low price.

Cons: Only 64MB of RAM, limiting performance and the ability to run Mac OS X.

Company's estimated price: $1,299

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

iBOOK WITH COMBO DRIVE

Rating: ♦♦♦♦½

Pros: Lightweight; elegant design; full set of features; low price; new combination drive is a breakthrough.

Cons: None significant.

Company's estimated price: $1,799

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

iBOOK WITH DVD-ROM DRIVE

Rating: ♦♦♦♦½

Pros: Lightweight; elegant design; full set of features; low price.

Cons: None significant.

Company's estimated price: $1,499

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

Building an exciting new notebook computer when price is not a concern is one thing. Building an exciting new notebook computer when price is the foremost consideration is another thing entirely. And Apple's new iBooks *are* another thing entirely—they're consumer portables that defy the label "low end."

Svelte by Design

In the world of sub-$2,000 portable computers, trade-offs are unavoidable. Want a small, lightweight machine? You'll have to give up an internal CD-ROM or DVD-ROM drive and many port options, such as high-speed peripheral connections or Ethernet. Otherwise, be prepared to lug around a 6-pound behemoth. And as for design, "boxy but good" would be a generous description of most Windows-based laptops.

Enter Apple. Its first foray into the consumer-notebook market—the original iBooks—delivered the features, but at a weight that made schoolchildren stagger. Now Apple has come back with an inexpensive portable-computing product of maximum utility and minimum weight.

The new iBook offers all the features you could want in a machine with a starting price of $1,299: a 10GB hard drive, a 1,024-by-768-pixel screen, 10/100BaseT Ethernet and FireWire connections, two USB ports, AirPort readiness, a built-in 56-Kbps modem, composite and VGA video out, and a 500MHz G3 processor.

But the higher-end configurations go a step further, giving you 128MB of RAM, a DVD-ROM drive, and—a first for Apple portables—a combination CD-RW and DVD-ROM drive, all in a 4.9-pound portable whose sleek design makes it as easy to look at as it is to hold and carry about.

And, building on the earlier models' well-deserved reputation for ruggedness, this iBook is twice as durable, Apple claims. Our own tests show that the new iBook is a tough customer: despite extensive banging around, rapid temperature and humidity changes, and even some blunt-force impacts, our units showed only a couple of tiny scratches. The

one exception was the keyboard: we inadvertently dropped a test unit on a hardwood floor, and although the iBook still ran just fine and the case had only a small nick, the force of the impact popped off the shift key, and we were unable to remount the key properly.

In stark contrast to the original iBooks' rainbow of colors, the new iBook is available only in elegant white. It's great that both professionals and students can tote these models without embarrassment, but we hope that Apple will offer other color options at some point.

iPowered?

From a design standpoint, the new iBook is groundbreaking. From a performance standpoint, it's almost identical to the model it replaces (*Reviews*, December 2000).

The new iBook has a moderately faster CPU—clocked at 500MHz, up from 466MHz. But its G3 processor still sits in a 66MHz bus and has just a 256K Level 2 cache, so the speed boost is largely lost in the shuffle. As you can see from Macworld Lab's benchmark tests, the 500MHz iBooks with 128MB of RAM have a Speedmark score nearly the same as the 466MHz iBook's—even with twice the memory. (The new model with only 64MB of RAM is actually a bit slower.) By comparison, the 400MHz PowerBook G4, with 1MB Level 2 cache and a 100MHz system bus, performs better by at least 20 percent across the board.

We understand that all consumer portables entail compromises, but we wonder why Apple continues to offer just 64MB of RAM in its entry-level machines when memory is dirt cheap—and when Mac OS X requires at least 128MB. And the iBook has only one RAM expansion slot, permanently limiting the expansion potential of the low-end configuration.

At least the new design puts everything within relatively easy reach: both the AirPort and RAM slots are located right under the keyboard. We just wish Apple would start including a screwdriver with models that require one to get to such an essential upgrade slot.

Apple's redesigned battery is a vast improvement over the "stick" used in earlier models. Although a screw lock still secures the battery (no doubt for durability), there's now only one screw. The new battery also adopts a smaller, square design that feeds power to the iBook through metal contacts instead of a ribbon cable, so it's easier to swap batteries.

As for battery life, Apple claims the new iBook can get up to five hours from a single charge. However, in our tests, which use moderate power-saving measures, these models delivered only three hours of run time.

Finally, there's the new screen: Apple has increased the resolution from 800 by 600 pixels to 1,024 by 768. The extra real estate is a boon, but because the screen size remains at 12.1 inches, the result is smaller pixels, which can make text difficult to read. You could switch to a lower resolution to increase the pixel size, but that means fuzzier pixels. Or you could use the new VGA adapter to connect a larger external monitor.

Speaking of displays, the iBook uses the same graphics controller as the last-generation iBook and the current-generation PowerBook. The ATI Rage 128 Mobility chip set is getting a bit long in the tooth and just can't keep up with the latest games—a problem in a laptop aimed at students.

Driven to Success

What everyone really wants to know, though, is how that new combination drive works. We're happy to report that it does indeed burn CDs and play DVDs without any obvious drawbacks. Of course, there's the small matter of having to first make a disk image of the CD you want to duplicate and then put a blank CD into the burner. But this minor inconvenience should actually increase the reliability of disc-to-disc copies.

In fact, we found the CD-RW/DVD-ROM combo so convenient that it justified that iBook's price—$300 more than the price of the $1,499 DVD-ROM iBook, which otherwise offers the same features.

Macworld's Buying Advice

As far as consumer portables are concerned, the trend seems to be including fewer features and giving less thought to design. Only Apple is bucking this trend. The new iBook is a small wonder—a beautifully crafted compromise that is true to Apple's philosophy of delivering feature-complete notebooks at an exceptional price. Our only major quibble is with the 64MB configuration, which unnecessarily limits the system's performance and makes it impossible to run Mac OS X. Otherwise, we found the new iBooks to be reliable, rugged, elegant, and a pleasure to use. **m**

A Shade of Difference

Macworld LAB TEST

Reference systems in italics. **Best results in bold.**
Shorter is better. Longer is better.

	SPEEDMARK 2.1 Overall Score	QUAKE III Normal	SOUNDJAM 2.5.2 MP3 Encode
Apple iBook G3/500 with 64MB, CD-ROM	93	23	3:19
Apple iBook G3/500 with 128MB, DVD-ROM	101	26	3:17
Apple iBook G3/500 with 128MB, combo drive	101	23	3:14
Apple iBook G3/466 with 64MB, DVD-ROM	*100*	*22*	*3:21*
Apple PowerBook G4/400 with 128MB, DVD-ROM	***122***	***32***	***2:13***
	Better ▶	Better ▶	◀ Better

Speedmark scores are relative to those of an iMac 350MHz (1999), which is assigned a score of 100. Quake scores are in frames per second. SoundJam scores are in minutes:seconds. We tested each system with Mac OS 9.1 installed, a default system disk cache, virtual memory enabled, and displays set to their native resolution and 24-bit color. We tested Quake III 1.17 at a resolution of 640 by 480 pixels, with graphics set to Normal. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long and converted it in SoundJam using a default setting of 128 Kbps. For more information on Speedmark, visit www.macworld.com/speedmark.—Macworld Lab testing by Jason Cox and James Galbraith

After Effects 5.0

Video-Effects Powerhouse Gains 3-D, Painting, and Flash Support

BY JIM HEID

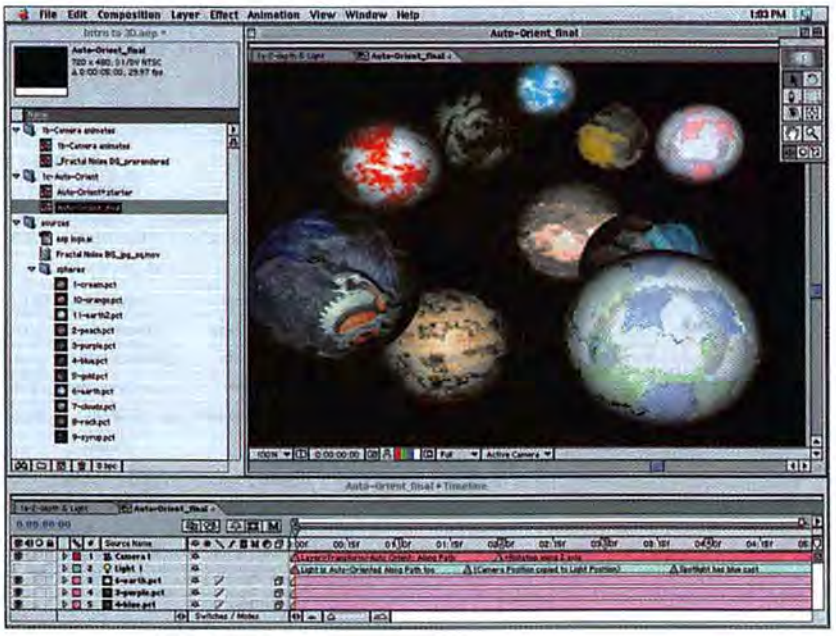
For video producers, 2001 has been an upgrade odyssey. This year has seen new versions of Adobe Premiere, Apple's Final Cut Pro and QuickTime, Media 100's CineStream, and now Adobe After Effects, the desktop-video world's top effects and motion-graphics tool. Richly layered video collages, video clips that spin and explode, titles that glow like neon—After Effects is the best place to whip up these and other flavors of eye candy, and version 5 is the most significant update yet. Adobe has added powerful new compositing and animation features, broadened After Effects' reach to encompass the Web, and enhanced the program's interface in ways that boost productivity and encourage experimentation.

Like previous versions, After Effects 5.0 is available in two forms: a $649 base version and a $1,499 Production Bundle, which provides more effects and capabilities (and is no longer encumbered by a hardware copy-protection key). I tested the Production Bundle, but everything in this review applies to both versions unless otherwise noted.

If you're running Mac OS X, you'll have to wait for the next major release of After Effects to get decent performance; version 5 isn't OS X native, and running it in Classic mode can crash your Mac.

Making a Good Thing Better

After Effects 5.0's interface is nearly identical to that of earlier versions. Most action takes place in the Composition window, where you position, resize, and manipulate imported movies and still images, and in the Timeline window, where you create *keyframes* that denote changes in an element's properties. But the program offers many interface and operational enhancements. For example, you can now change numeric values by *scrubbing* (dragging across them).



Previewing is also dramatically improved. After Effects now stores previewed frames in an internal cache, eliminating the need to rerender them unless you make a change that affects their appearance. You can speed previews by having After Effects render only a specific region of the Composition window. Unfortunately, on systems with a large amount of RAM allocated to After Effects, you may experience long delays while the program rearranges memory.

After Effects' Composition window now displays elements as you drag them, and you can now view your work in progress on an external FireWire or analog video device.

Entering Another Dimension

The star attractions of After Effects 5 are new 3-D features that let you cre-

AFTER EFFECTS 5.0

Rating: ♦♦♦♦

Pros: Superb new 3-D, parenting, and expression features; unmatched selection of effects.

Cons: Occasional delays when previewing; displays only one 3-D view at a time; one level of vector-paint undo.

Company's estimated price: $649 (upgrade, $199); Production Bundle, $1,499 (upgrade, $299)

Company: Adobe Systems, *800/833-6687*, **www.adobe.com**

ate dramatic effects, such as a title with rotating text that casts moving shadows as the text appears to zoom toward the viewer.

To create a 3-D composition, you click on boxes in the Timeline window to designate layers as 3-D. You can then adjust and animate numerous 3-D properties, including position, shadows, lighting, and shininess.

Working with 3-D layers is similar to working with 2-D ones, although you'll need to master some additions to the Composition window. When you select a 3-D layer, a set of *axes handles* lets you move the layer left or right, up or down, or closer or farther away.

After Effects 5 sees your scene through a virtual camera whose position and characteristics you can animate. You can create multiple cameras and switch between them; when you create a camera, you specify its optical characteristics. For greater realism, you can have the camera exhibit depth of field so that distant and close objects appear out of focus.

Mapping out 3-D camera paths on a 2-D computer screen is tricky, but After Effects' Composition window helps by providing several views. Each shows your scene from a different angle, and you can switch among them to accurately arrange layers and camera positions. Alas, the program displays only one view at a time.

After Effects' 3-D–rendering engine has some limitations. For example, it can't correctly render layers that intersect each other. Adobe is developing an enhanced rendering plug-in that will address this issue; a beta version is available on the company's Web site.

The new 3-D features may be aimed at eye-candy producers, but documentary producers will also love them: they enable After Effects to mimic a rostrum camera—a motorized camera-and-bench system often used for complex pans and zooms across still images and artwork. Although video-editing programs such as Final Cut Pro and Premiere have simple pan-and-scan features, they lack the versatility and control of a camera (even a virtual one) operating in 3-D space.

Parenting and Expressions

In earlier After Effects versions, making elements change or move in relation to each other required copying and pasting keyframes and duplicating motion paths. After Effects 5.0's new parenting features make short work of these tasks. You can now set up a relationship between layers simply by dragging an icon from one layer to another. You can also apply parenting to 3-D layers, lights, and cameras.

Effects with Depth After Effects' custom views show a scene from different angles. The camera and its axes handles appear at the lower right.

After Effects 5 lets you create relationships between properties as well. By creating snippets of code called *expressions,* you can have one property affect another, on the same layer or on a different layer. Expressions are written in JavaScript, but you don't have to be a programmer to use them. After Effects' new *pick whip* builds the expressions for you as you click and drag in the Timeline window. You can modify the expressions After Effects creates, or write your own from scratch.

More Effective

After Effects is all about effects, and version 5 introduces some slick new ones. A new Shatter filter annihilates a layer, exploding it into pieces in a variety of shapes, from glass shards to puzzle pieces. The Radio Waves effect simulates pond ripples, radio waves, Spirograph patterns, and other repeating shapes. The Vegas filter lets you outline elements with pulsing lights and theater-marquee effects. Colorama creates pulsing color effects, and Fractal makes animated fractal patterns.

The Production Bundle includes some additional effects. The superb Fractal Noise creates beautiful backgrounds and patterns, and Optics Compensation adds or removes lens distortion. The bundle also includes a vector-painting effect that lets you paint directly on video frames: After Effects will play back your paint strokes either in real time or all at once. Unfortunately, Vector Paint supports only one level of undo.

Broader Output, Better Color

Although After Effects is most commonly used for TV and film effects, its ability to export compositions as Macromedia Flash SWF files gives it a place on the Web, too. You can't add interactive buttons to compositions, but you can associate URLs with markers so that a user's Web browser goes to different pages or frames as a Flash file plays back.

When you export a project in Flash format, After Effects can rasterize any graphics that don't translate to Flash's vector format.

Macworld's Buying Advice

My chief complaint about After Effects 5.0 is its documentation, which is lean on examples and barely mentions how to use many of the filters and effects; instead it refers you to Adobe's Web site, where you'll find some fine tutorials. Even so, After Effects retains its title as the Mac's top motion-graphics tool. Pinnacle Systems' Commotion (♦♦♦♦½; *Reviews,* November 2000) offers superior paint and rotoscoping features, but its effects and compositing features fall short of After Effects', and it lacks After Effects' refined interface and tight integration with the rest of Adobe's product line. **m**

FireWire 16x CD-RW Drives

Blazingly Fast and BURN-Proof, Too

BY KRISTINA DE NIKE

Apple has finally started putting internal CD-RW drives in its new systems, but that's of little comfort to those who own earlier Macs. If you long for the unlimited capacity, quick file sharing, and handy backup a CD-RW drive offers, you're in luck: you can add a speedy external drive to your system for about $300.

We evaluated ten of the fastest new drives on the market. They all use FireWire technology, which is 30 times faster than USB, and they're all rated at 16×10×40×, so they can burn a full CD-R in about six minutes. (See our roundup of USB CD-RW drives at www.macworld.com/2001/06/19/reviews/usbcdrw.html.) Five of the drives we tested—those from Acomdata, CD CyClone, Formac, LaCie, and MadLogix—use the same Sanyo mechanism. The ClubMac and EZQuest models rely on a TEAC mechanism, while the QPS drive contains a Plextor mechanism. The remaining drives—from Yamaha and FireWireDirect.com—use a Yamaha mechanism.

No More Coasters

For years, the most serious problem with CD-R drives has been buffer underruns: if the computer doesn't supply a steady stream of data, the drive intermittently runs out of data and writes blank space, which CD-ROM drives can't interpret. The result is a disc that's useful only as a coaster.

Eight of the drives we tested—those with Sanyo, Plextor, or TEAC mechanisms—use Sanyo's BURN-Proof technology to avoid buffer underruns. These drives stop recording when the 2MB buffer is less than 10 percent full; when the flow of data resumes and fills the buffer, the drive returns to the previous stopping point, compares the burned data with what's in the buffer, and continues recording.

The Yamaha and FireWireDirect.com drives don't include BURN-Proof, but their 8MB buffers give them time to recover from a data glitch. Because these drives never pause, they're always burning at maximum speed. If you want to take data directly off a network or the Internet and burn it onto a CD, you're safer with a BURN-Proof drive; otherwise, any of the drives will give you speedy reads and writes with few wasted discs.

The Numbers Game

In a 16×10×40× drive, the first number refers to CD-R burn speed, the second to CD-RW write speed, and the last to CD-ROM read speed. We tested the drives with 16×-rated CD-R media and 10×-rated CD-RW discs, using a Power Mac G4/500 running Mac OS 9.1 (all the drives appeared on the desktop in OS X). The drives worked as advertised—all claim the same speeds, and in each test their times fell within a minute of each other. They also bested our baseline QPS Que Fire 12×10×32× in CD-R burning, and all but the MadLogix drive beat the older Que Fire in the Install Quake test, which indicates CD-ROM read speed.

iTunes and Disc Burner (both downloadable for free from Apple's site) work with all the drives. However, iTunes burns only audio CDs, and Disc Burner burns only Macintosh single-session CDs; to create multiple sessions or use any other format, you need an application such as Roxio's Toast (www.macworld.com/2000/02/reviews/toast4.html). All the drives include Toast 4.1.1 or 4.1.2, though FireWireDirect.com bundles

PETER BELANGER

The LaCie 16x10x40x U&I (left) and the ClubMac FireWire 16x/10x/40x

the application only if you purchase it from the company's Web site for an additional $1 when you order the drive. (The latest version, Toast 5.0, isn't available bundled with drives as of this writing.)

CD-RW drives are great backup devices. Unfortunately, Dantz's Retrospect backup software hasn't yet been updated to support these drives, though it should support the Yamaha, TEAC, and Plextor mechanisms by the time you read this; check Dantz's Web site (www.dantz.com) to see if the program supports the Sanyo mechanism.

Built Like a Brick

An ideal drive has an internal power supply rather than an external power brick; its case is sturdy, with a flat top for stackability. The drives from Acomdata, ClubMac, FireWireDirect.com, MadLogix, and Yamaha all fit this description. The CD CyClone and Formac drives' metallic cases, though eye-catching, are too curved to allow stacking. And both drives come with external power bricks, although you can power the Formac via the FireWire bus.

The LaCie drive includes a USB port in addition to the two FireWire ports. You can attach the drive either way—handy if you're using it with both an older iMac and a newer Mac.

While FireWire drives are extremely easy to set up, you should get a manual for your $300. QPS and Yamaha provide thorough documentation, including a section on using Toast. ClubMac, Formac, and LaCie also include decent manuals. The manuals from Acomdata, CD CyClone, FireWireDirect.com, and MadLogix consist simply of a few pages of quick-start instructions.

Too Close to Call

Macworld LAB TEST

Reference system in italics.
Best results in bold.
Shorter is better.

	TOAST 4.1.2		QUAKE III
	Burn 650MB File (CD-R)	Burn 100MB File (CD-RW)	Install Quake
Acomdata FireWire CD-Rewritable Drive	5:40	2:10	2:51
CD CyClone CDRevo	5:38	2:13	2:31
ClubMac FireWire 16×/10×/40×	5:58	**2:03**	**2:22**
EZQuest Boa CDR/W 16×10×40 FireWire External	6:00	**2:03**	**2:22**
FireWireDirect.com FireCD 16×10×40 Yamaha	5:50	2:08	2:44
Formac cdrw 16/10/40	5:39	2:10	2:31
LaCie 16×10×40× U&I	5:37	2:10	2:31
MadLogix Alien 16×10×40 External FireWire	5:37	2:16	3:17
QPS Que Fire CD-RW 16×10×40 External	**5:31**	2:04	2:30
Yamaha LightSpeed CD-RW Recorder CRW2100FXZ	5:50	2:16	2:53
QPS Que Fire 12×10×32×	*7:13*	*2:04*	*3:01*
	Better	Better	Better

We tested each drive in a Power Mac G4/500 with Mac OS 9.1, 128MB of RAM, a default system disk cache, and virtual memory enabled. Results are in minutes:seconds and do not include verification times.—**Macworld Lab testing by Jason Cox**

Macworld's Buying Advice

All ten drives are easy to set up and fast, and most cost about $300. You can't go wrong with any of them, but we preferred the ClubMac and LaCie drives. The ClubMac FireWire 16×/10×/40× has a good price, toll-free tech support, and a simple case, and it comes with five iMac-colored faceplates. The LaCie 16×10×40× U&I's additional USB port allows you to use it with a USB Mac (although USB supports only 4× speed). **m**

FireWire CD-RW Drives Compared

COMPANY	PRODUCT	MOUSE RATING	COMPANY'S ESTIMATED PRICE	CONTACT	MECHANISM	PROS	CONS
Acomdata	FireWire CD-Rewritable Drive	●●●	$330	909/613-9488, www.acomdata.com	Sanyo	Stackable case.	Tech support is a toll call.
CD CyClone	CDRevo	●●●	$339	714/247-0099, www.cdcyclone.com	Sanyo	Small case.	External power brick.
ClubMac	FireWire 16×/10×/40×	●●●●	$290	800/217-9153, www.clubmac.com	TEAC	iMac-colored faceplates.	No description of Toast in manual.
EZQuest	Boa CDR/W 16×10×40 FireWire External	●●●½	$289	714/694-0031, www.ezq.com	TEAC	Solid case.	Not stackable.
FireWireDirect.com	FireCD 16×10×40 Yamaha	●●●½	$299	512/302-0012, www.firewiredirect.com	Yamaha	Has 8MB buffer.	Toast not included automatically.
Formac	Formac cdrw 16/10/40	●●●½	$289	877/436-7622, www.formac.com	Sanyo	Powered by FireWire bus.	Not stackable.
LaCie	16×10×40× U&I	●●●●	$300	503/844-4500, www.lacie.com	Sanyo	Has both FireWire and USB connectors.	Not stackable.
MadLogix	Alien 16×10×40 External FireWire	●●●½	$270	877/462-5436, www.madlogix.com	Sanyo	Least expensive in roundup.	Slowest CD-ROM read times.
QPS	Que Fire CD-RW 16×10×40 External	●●●½	$279	800/559-4777, www.qps-inc.com	Plextor	Nice carrying case.	Not stackable.
Yamaha	LightSpeed CD-RW Recorder CRW2100FXZ	●●●	$360	800/926-2426, www.yamaha.com	Yamaha	Has 8MB buffer.	Most expensive in roundup.

Analog-to-DV Converters

Devices Add Audio and Video Capture to FireWire Macs

BY JEFFY K. MILSTEAD

Perhaps you're intrigued by Apple's new focus on digital video, but own an analog camcorder or have a pile of home movies on VHS tape. In either case, you'll need some way to get that analog video into your Mac digitally. The best way to do that is with a FireWire analog-to-DV converter, which can send the audio and video from your Mac right back out to your TV screen. And if you already own a DV camcorder with analog inputs, a converter can handle the link to your computer so you won't have to frantically unplug your camcorder each time you rush out to capture breaking events on videotape.

We looked at four analog-to-DV converters that offered similar features: the Dazzle Multimedia Hollywood DV-Bridge, the Formac Studio, the Power R Director's Cut, and the Sony DVMC-DA2 Media Converter. All the products performed as advertised, but the Formac Studio stood out as the most Mac-compatible and innovative of the bunch.

Making the Connection

When you play analog audio and video, a converter box digitizes the media and converts it into the same DV format used by digital camcorders; that data is sent to your Mac via FireWire.

Hooking up a DV converter is simple: just plug it into a six-pin FireWire port on your computer and connect it to your video source, and it's ready to go. The Hollywood DV-Bridge and Formac Studio converters come with the necessary FireWire cables. However, the Sony unit includes a FireWire cable with a four-pin connector—ideal for hooking the converter up to a Sony Vaio but not, unfortunately, to your Mac. And only the DVMC-DA2 includes an S-Video cable and an A/V cable for connecting the audio.

Once the converter is connected to the computer and the camcorder, you can begin capturing or exporting video. In tests with a 500MHz G4 Power Mac and an iMac DV, we were able to capture and play back video using each of these converters from within Apple iMovie 2.0.3 (including the Mac OS X version), Adobe Premiere 6, and Apple Final Cut Pro 2. We didn't notice any differences in image quality among the four.

In our tests, iMovie immediately recognized all the converters with no problem. For Premiere, we had to select each device specifically from a control menu before the program could communicate with the converter. The Formac Studio and the Hollywood DV-Bridge detect whether you're capturing or outputting a signal, and they have LED indicators that show the direction of transfer. Both also have buttons for switching sources, in case automatic switching doesn't kick in. With the DVMC-DA2 and the Director's Cut, you must switch sources manually.

The Formac Studio

SCOTT PETERSON

From Geek to Sleek

In the industrial-design department, the Director's Cut looks as though it belongs in a TV studio: it's housed in a sturdy, utilitarian black metal box that only an engineer could love. At the opposite end of the aesthetic spectrum is the Formac Studio, a curved silver box that would look more at home in an ad agency (Formac also

Analog-to-DV Converters Compared

COMPANY	PRODUCT	MOUSE RATING	COMPANY'S ESTIMATED PRICE	CONTACT	PROS	CONS
Dazzle Multimedia	Hollywood DV-Bridge	3½	$299	888/212-8045 www.dazzle.com	Remote control of Sony Handycams.	Structurally unstable; requires external power supply.
Formac	Studio	4	$399	877/436-7622 www.formac.com	Powered by FireWire bus; extra FireWire port; sleek design; includes software.	Pricier than the others.
Power R	Director's Cut	3½	$349	800/729-6970 www.powerr.com	Powered by FireWire bus; extra video output for monitor; dedicated headphone jack.	Requires manual switching; less aesthetically pleasing than the others.
Sony Electronics	DVMC-DA2 Media Converter	3	$299	800/222-7669 www.sel.sony.com	Remote control of Sony Handycams.	Requires external power supply; 4-to-4 pin FireWire cable only; no PAL support; copy protection.

sells a clear model). The compact DVMC-DA2 has the simple elegance typical of Sony gear, while the lithe form and vertical orientation of the Hollywood DV-Bridge make the device so structurally unstable that even the strain from the connecting cables can pull it over.

S-Video and AV jacks are standard on all the converters, but the Director's Cut carries an extra S-Video–out port for monitoring the signal being sent to the VCR—a handy feature you'd normally find only in professional studio equipment. It also has a quarter-inch headphone jack with a level knob. The Formac Studio includes two additional coaxial inputs, for cable TV and antennae.

Tune In The Formac Studio lets you turn live video into something resembling Web-cam footage. Add time stamps, titles, and even blurring mosaic patterns to an image.

The Hollywood DV-Bridge and DVMC-DA2 use external power supplies; the Director's Cut and Formac Studio take a more convenient approach, drawing power from the FireWire bus. The Formac Studio also has a second FireWire port, for daisy-chaining other peripherals.

The Details

The Formac Studio offers some unique features, including a TV and radio tuner and an internal speaker. An option in the ProTV tuner software allows it to search for available TV and radio channels; you can assign names to the individual stations it finds. The ProTV software can also capture timed snapshots to a folder—handy if you're building a Web cam. Unlike Formac's other TV tuner product, the ProTV PCI card (*Reviews*, October 2000), the Formac Studio doesn't support closed-captioning or let you adjust brightness and contrast.

The Formac Studio also offers more playback options than the others, supporting 16:9 and 2.35:1 aspect ratios in addition to the standard 4:3. All four products support the NTSC video format, which is common in North America, and all but the DVMC-DA2 support the PAL format, found overseas. In addition, the DVMC-DA2 is the only converter in our roundup that supports Macrovision, an analog copy-protection scheme used by most DVD players and VCRs. Videotapes and DVDs that have the Macrovision signal embedded will appear normal when viewed on most TVs; when they're recorded to tape and played back, however, the image will be distorted and unwatchable. It makes sense that Sony Pictures wants to prevent its movies from being copied, but we believe you're better off using a product that doesn't put up this kind of a roadblock.

If you own an analog Sony Handycam, the DVMC-DA2 and the Hollywood DV-Bridge let you control your camcorder's playback functions from within Premiere or iMovie, making these features almost as easy to use as a digital camcorder. In those applications, however, the DVMC-DA2 required us to switch manually between playback and editing modes.

Macworld's Buying Advice

If, in addition to converting analog audio and video, you want to add a TV and radio tuner to your Mac or would benefit from the flexibility of an added FireWire port, the Formac Studio is a great all-in-one choice. If you need a dedicated headphone jack or an extra video output, consider the Power R Director's Cut. If you're on a budget and willing to forgo extra features, choose the Dazzle Hollywood DV-Bridge. The DVMC-DA2, with its copy protection and lack of PAL support, is the least attractive option. **m**

LINKS

More Info:
www.wwug.com

Find DV-related tutorials and forums at this user-group site.

More Info:
www.adobe.com/motion/tips/main.html

Adobe's Web site offers tips and techniques for working with digital video.

Adobe Photoshop Elements

Most of Photoshop's Bang, for Minimum Bucks

BY GALEN FOTT

Adobe Photoshop has long been heralded as the unchallenged champion of image editing. So why doesn't everybody use it? Two reasons: the cost ($609) and the learning curve (lengthy). With its recent reworking of the old Photoshop LE, Adobe takes the Eraser tool to those obstacles. Priced at only $99, Photoshop Elements combines an astonishing amount of Photoshop 6.0's power with helpful, nonintrusive guidance.

ADOBE PHOTOSHOP ELEMENTS

Rating: ♦♦♦♦½

Pros: Exceptional value; includes many of Photoshop's most powerful tools; excellent help features.

Cons: Unimpressive instant-fix features; not Mac OS X native.

Company's estimated price: $99

Company: Adobe Systems, *800/833-6687*, **www.adobe.com**

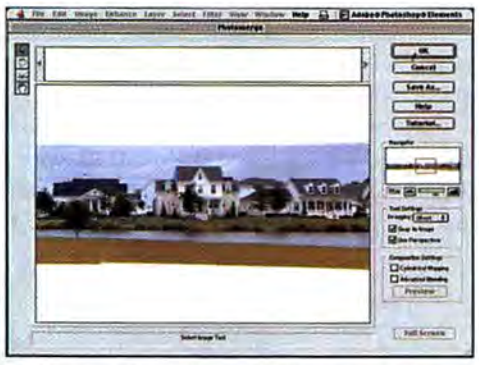
RGB Acres

Adobe isn't quite giving away the farm with Photoshop Elements, but it's certainly being generous with the acreage. In addition to Photoshop 6.0's basic tools, Elements contains high-end features such as the History palette (making Photoshop LE's single undo seem like a bad dream), adjustment layers, dialog-box–free text input, the Warp Text and Liquify commands, GIF animations, and all 99 effects filters. Elements also opens and saves a full range of file formats, including EPS and PDF.

Some features are slightly scaled back compared with their Photoshop counterparts, but by and large, Adobe has left out only features that graphics professionals might miss. Most conspicuous by their absence are CMYK Color mode, recordable actions, the Channels palette, editable vector shapes, and advanced selection tools such as masking.

Another element missing from this application's periodic table is Carbon. Elements doesn't run natively in OS X, and Adobe is mum on when a Carbonized version might appear. On the plus side, I was able to pull in a scan while running Elements in OS X's Classic mode, despite a warning on Adobe's Web site that it couldn't be done.

In addition to borrowing from Photoshop, Elements offers a few features of its own. The most interesting is the Photomerge command, which does a commendable job of combining a group of images into one large, panoramic shot. Some new instant-fix features are less impressive: the Red Eye Brush tool and Straighten And Crop Image command yield haphazard results at best.



Mergers and Acquisitions The Photomerge command turns a group of images into a panorama.

Element-ary School

Photoshop Elements may throw in a few one-click wonders, but such tools are contrary to Photoshop's technical nature. Happily, Elements excels at explaining the technical stuff. Rest your cursor over a tool, and the Hints palette displays a brief, illustrated explanation of that tool's use; the Recipes palette offers step-by-step instructions for common tasks, such as adjusting an image's tonal range and restoring damaged photos. And you can download additional recipes from Adobe's Web site.

Elements contains individual palettes for filters, effects (the prerecorded actions that ship with Photoshop 6.0), and layer styles. These helpful palettes give you visual clues as to how a particular change to your image might look.

Once you've mastered the basics and need in-depth information, the application's built-in help and 270-page manual can fill in the details.

Macworld's Buying Advice

Photoshop Elements gives you roughly five-sixths of Photoshop's power for less than one-sixth the price. That missing one-sixth is crucial for graphics professionals, particularly those working in the print field. But if you don't make a living creating graphics, this is probably all the image editor you'll ever need; it's vastly superior to both its predecessor, Photoshop LE, and Adobe's antediluvian PhotoDeluxe for the Mac. Photoshop Elements makes it easy and affordable to learn image editing the best way: with Adobe Photoshop. **m**

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- G3 Server
- PowerTower Pro
- PowerWave
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LightWave 6.5

High-End Package Brings Impressive 3-D Effects to the Mac

BY MATT LOWRIE

Given the Mac's graphics superiority, it's surprising that 3-D production work on our platform of choice has until recently been a piecemeal process. One of the first fully integrated 3-D packages to migrate to the Mac from the Unix world was NewTek's LightWave, a powerful application for creating television and film effects. Now at version 6.5, LightWave's wealth of professional modeling and animation tools rivals those of programs such as Electric Image Universe and Maxon's Cinema 4D.

The Sum of the Parts

LightWave is actually a collection of separate applications: Modeler, for creating objects; Layout, for animating and rendering scenes; and Hub, which updates projects when you make changes in Modeler or Layout.

Modeler is polygon- and spline-based; it offers an efficient surface-subdivision mode in which you can create smooth organic forms similar to what you'd get with NURBS modeling. The program includes a collection of tools for patch modeling, along with "viewports" that you can use as UV mapping editors for precise placement of textures.

For creating bone hierarchies, Layout lets you set hybrid forward and inverse kinematics explicitly for each bone. The visual Graph Editor makes it easy to fine-tune smooth-keyframe interpolation using Bézier or TCB (tension, continuity, bias) curves. The unresponsive pan tool and time slider can be frustrating, however.

Some notable additions in version 6.5 are an integrated particle system, a soft-body dynamics engine, automated Atlas mapping tools, and a new Schematic view. Other welcome enhancements include a reorganized interface; a Bézier-curve tool in Modeler; and resizable viewports and front, left, and bottom views in Layout.

You'd think that documenting all these new features would be a high priority, but that doesn't appear to be the case. LightWave 6.5 ships with the printed manuals for version 6; the 6.5 addendum is available only in PDF form. Equally disappointing is the lack of an index and the fact that the manuals assume you're using the Windows version.

Complex Made Easy

Several powerful procedural animation tools make complex motions easier to set up. An integrated particle generator—when used in conjunction with HyperVoxels, LightWave's volumetric-object generator—lets you simulate smoke, explosions, and fluids. Motion Designer can force objects to behave like cloth that can be influenced by any other element in the scene. And you can use animation expressions and modifiers to automatically move objects based on other objects' behavior.

But no matter how many impressive features a 3-D package offers, it all comes down to rendering—and in this area, LightWave excels. The ray-tracing engine can calculate realistic reflections, refraction, and caustics; the radiosity engine supports high-dynamic-range calculations of bounced light, allowing you to illuminate a scene using only photographs saved in the HDRI format. LightWave also supports distributed rendering, either on one multiprocessor machine or over a TCP/IP network.

Hats Off to Mapping LightWave's Atlas function automatically "unwraps" models.

Macworld's Buying Advice

If you want a complete 3-D–production package for character animation, product design, or visual effects, LightWave 6.5 is a great value—especially when you consider that many of its standard features, such as particles and dynamics, are available only as expensive plug-ins in other packages. **m**

LIGHTWAVE 6.5

Rating: ★★★★½

Pros: Integrated 3-D tools; excellent rendering engine; integrated particle system and soft-body dynamics engine.

Cons: Poor documentation.

Company's estimated price: $2,495

Company: NewTek, *800/862-7837*, **www.newtek.com**

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RealBasic 3.2

The Easiest Way to Program Your Mac

BY DORI SMITH

Does your mental image of BASIC involve line numbers, procedural code, and single-character variable names? If so, you don't know how far the language has come. Real Software's RealBasic 3.2 offers all the convenience of a modern object-oriented language while retaining the simplicity of the venerable BASIC syntax, making it a lot easier to create applications with. And because the program takes a visual approach to building user interfaces, it's the simplest way for nonprogrammers to start coding.

Not Your Father's BASIC

Programming on the Mac used to involve writing line after line of C or C++ code, primarily just to create standard user-interface elements. Fortunately, RealBasic's Rapid Application Development (RAD) support allows you to make a prototype of your interface quickly. To begin constructing an application, you create a blank window and drag predefined user-interface elements into it from the Tools palette. Once you've laid out the interface, it's much easier to add the code to power that interface. Though there's still plenty of code to write at this point, RAD enables you to see—and, more important, test—how well each piece works within the larger picture.

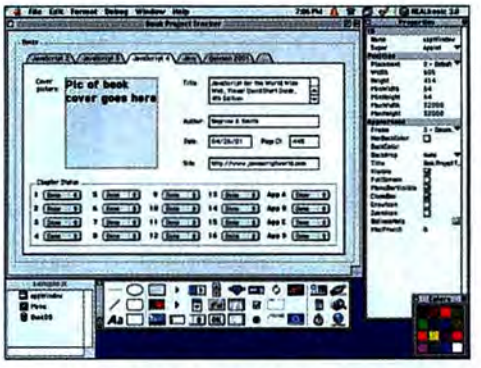
Version 3.2 is both more powerful and easier to use than version 2 (*Reviews*, October 1999), with a new Sprite engine, which gives you greater control over animation, and a handy autocompletion feature. The List box and Edit fields offer greater functionality, such as improved scroll bars and scroll positioning, and their appearance is now more accurately reflected in the Window editor.

The Three OSs

RealBasic 3.0 was advertised as being compatible with Mac OS X, but it had problems with the final version of the OS. RealBasic 3.2 remedies them; both the development environment and the applications it produces are Carbon compliant. Although it's too bad that RealBasic can't produce Carbon and Classic applications simultaneously (you have to run the compiler twice, picking a target environment each time), the Carbon applications run just fine under OS 9.

RealBasic is available in both a $100 standard edition and a $300 professional edition (add $50 if you want a software CD and printed documentation); the latter lets you compile Windows applications and includes a single-user relational database engine that can also connect to any ODBC-compliant database.

At first glance, the documentation—a tutorial, a developer's guide, and a 1,200-page language reference—looks impressive. However, neither the table of contents in the developer's guide nor the index in the language guide matches the actual contents. Worse, the tutorial assumes you already know something about programming, using terms such as *properties* and *classes* without defining them. Fortunately, novice coders who need help can turn to the active online community of RealBasic users—just follow the links from Real's Web site.



Look, Ma, No Code! RealBasic's visual design tools let you lay out your user interface before you code.

Macworld's Buying Advice

If you're looking for the easiest way to start programming your Mac, RealBasic 3.2 is the answer. Its closest competition—Metrowerks' $50 CodeWarrior Learning Edition 2, which includes C, C++, and Java—has a harsher learning curve, due to the professional development environment it shares with its predecessor, CodeWarrior Professional. RealBasic isn't without flaws, but its ease of use and drag-and-drop approach can quickly turn novice coders into programmers, and programmers into coding machines. **m**

REALBASIC 3.2

Rating: ♦♦♦♦

Pros: Easy user-interface creation; cross-OS capabilities.

Cons: Weak documentation.

Company's estimated price: $100

Company: Real Software, *512/263-1233*, **www.realsoftware.com**

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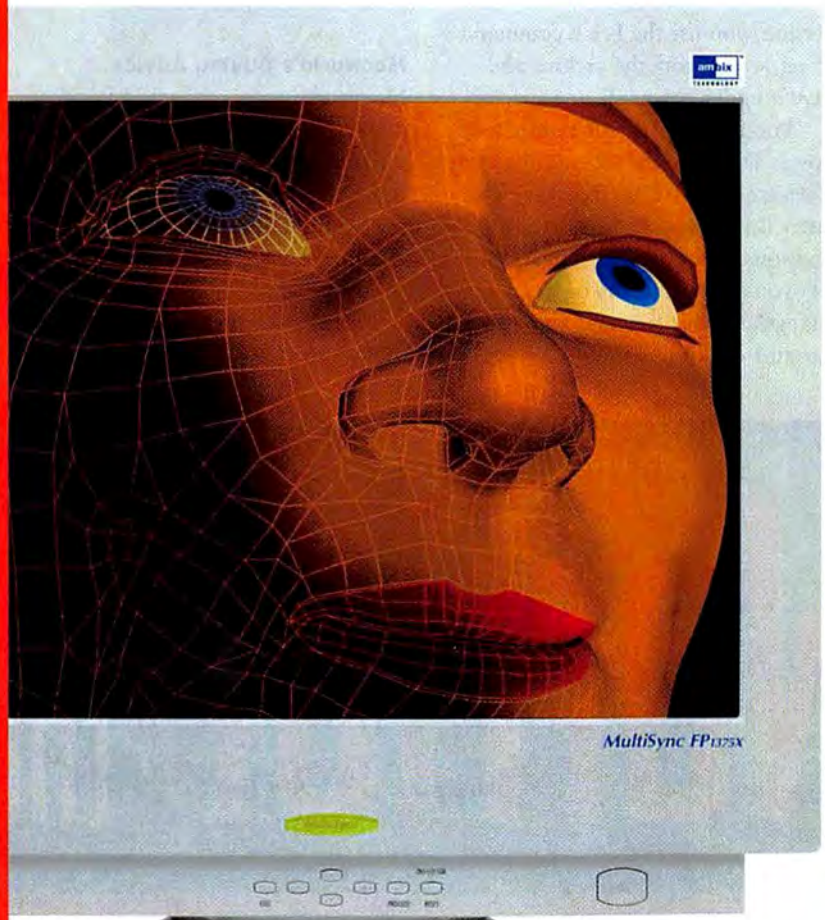

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Voodoo Personal 2.0

Powerful Utility Manages File Revisions

FOR YEARS, software developers have relied on version-control systems to keep track of multiple editions of their source code. Now Voodoo Personal brings this power to anyone who needs to save and recover revisions to any type of file, created in any application. Whenever you create a version that you might want to retrieve later, you instruct Voodoo to put a copy of the file in its archive. To conserve disk space, Voodoo stores only the differences between versions and uses those differences to re-create an entire file.

In the History window, you can see a summary of all the file revisions you've kept. Voodoo lacks a built-in file viewer, but you can open any file in the archive using the application that created it. To revert to an earlier version, you use the Fetch command to retrieve it from the archive and save it under any name you specify.

Voodoo superficially resembles Power On Software's Rewind (♦♦♦½; *Reviews*, April 2001); however, the latter isn't designed to manage file revisions. For example, only Voodoo lets you add comments on document changes to your files and manage variants of files.

Rating: ♦♦♦½

Pros: Stores and retrieves multiple versions of a file; easy on disk space.

Cons: Difficult to learn.

Company's estimated price: $99

Company: Uni Software Plus, *voodoo-sales@unisoftwareplus.com*, **www.unisoftwareplus.com**

Old Versions The History window lets you see all your revisions at a glance.

Macworld's Buying Advice

Nonprogrammers may find Voodoo Personal's terminology somewhat intimidating, and the tutorial illustrates the mechanics of version control without adequately explaining the underlying concepts. Once you get the hang of it, though, you'll find Voodoo Personal an indispensable tool.—FRANKLIN N. TESSLER

DiskWarrior® has than

1999 Macworld Editors' Choice Awards
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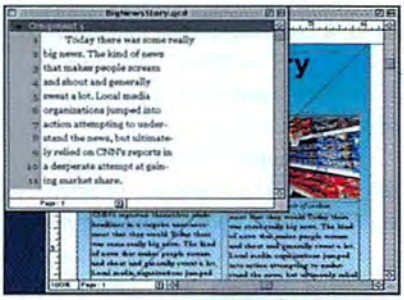
QuarkCopyDesk SE 2.0

A Word Processor Only a QuarkXPress User Could Love

YOU'VE HEARD THE ADAGE "Use the right tool for the job." If you need to edit a large amount of text in a QuarkXPress document, the right tool may just be QuarkCopyDesk SE 2.09. This stand-alone program is a cross between QuarkXPress and a word processing program. It combines the typographic controls of XPress with tools designed for editors, such as galley and full-screen modes that display text in an easy-to-read font and size but with line breaks intact, allowing editors to work in a program designed for editing rather than in the designer-oriented—and more expensive—XPress.



Don't Strain Your Eyes It's much easier to edit text in QuarkCopyDesk SE (top layer) than in QuarkXPress (bottom layer).

Workflow is simple: you export text from XPress and open it in CopyDesk SE, which displays the page layout. The program knows how much text an Xpress box can hold, so you can edit to fit. Unfortunately, CopyDesk SE lacks keyboard and menu shortcuts for automating the import and export of text. In addition, there's no way to export or import more than one story in a document, overset text isn't indicated in the page-layout view, you can't turn off style features, and there are no revision marks.

Rating: ♦♦♦

Pros: Galley and full-screen views; can copyfit text outside of QuarkXPress.

Cons: Importing and exporting text is awkward; can't disable text formatting; no revision marks.

Company's estimated price: $299

Company: Quark, *800/676-4575*, **www.quark.com**

Macworld's Buying Advice

Any QuarkXPress user who deals with large amounts of text will appreciate QuarkCopyDesk SE's tools, but the cost and hassle of using a separate program limit CopyDesk SE's usefulness.—DAVID BLATNER

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iView MediaPro 1.0

Indispensable Tool for Organizing Digital Assets

NEED A WAY to organize your digital photos or your Mac's multitude of graphics, sounds, fonts, and movies? Look no further than iView Multimedia's powerful yet affordable asset-management program, iView MediaPro 1.0.4.

The program's simple interface lets you create catalogs by dragging files, folders, and complete volumes into the application's main window. You can view files as thumbnails or full-size images, as well as play movies and audio files. iView MediaPro offers an abundance of ways to find and sort, including by assignable keyword, and it supports a wide variety of media files. You can export your catalogs of digital assets as HTML documents, contact sheets, and QuickTime slide shows. You can even adjust image brightness, color, and sharpness from within the program.

While we highly recommend iView MediaPro overall, unlike programs such as Canto's Cumulus and Extensis's Portfolio (which are admittedly much more expensive), it doesn't let you share catalogs across a network. In addition, the program is buggy under OS X.

Macworld's Buying Advice

iView MediaPro is a terrific utility. For OS 9 users on a budget, there's just no better way to organize digital-media files.—CHRISTOPHER BREEN

Rating: ●●●●½

Pros: Catalogs a wide variety of media files; strong export features; built-in image calibration.

Cons: Doesn't perform well under OS X.

Company's estimated price: $45

Company: iView Multimedia, *800/903-4152*, **www.iview-multimedia.com**

FotoShow

Digital Slide-Show Device Has Limited Appeal

DO YOU WANT TO PUT ON a digital slide show without forcing friends or coworkers to crowd around your computer? The FotoShow, from Iomega, lets you display images as a slide show or on-screen photo album on a TV or VCR. You connect the device to your TV via the included composite (RCA) cable, insert a CompactFlash or SmartMedia card or a PC-formatted Zip disk containing your images, and then use the FotoShow's remote control and on-screen menus to organize your photos.

Unfortunately, the tutorial offers little practical information; I had to consult the somewhat confusing manual to figure out many steps in the process. Because the on-screen menu system is ambiguous, I almost erased an entire project by mistake. And although the FotoShow includes some basic image-editing tools, they lean more toward fun effects than serious editing.

Macworld's Buying Advice

The FotoShow lets you create decent slide shows, but its appeal will be limited by the fact that many digital cameras can display images as slide shows on a TV, and by the availability of inexpensive slide-show software such as Interactive Solutions' $80 MovieWorks (*Reviews*, June 2001). With its high price and limited usefulness, the FotoShow is difficult to recommend.—ADRIENNE ROBILLARD

Rating: ●●½

Pros: Doubles as a USB Zip drive; decent results.

Cons: Expensive; confusing manual and tutorial; Zip disks must be PC formatted.

Company's estimated price: $250

Company: Iomega, *888/516-8467*, **www.iomega.com**

Macworld.com

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Portable MP3 players

- ●●½ Archos Jukebox 6000
- ●●●●½ Nomad Jukebox

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- ●●●½ CD Cyclone USB CD Revo 4×4×32×
- ●●● Iomega CD-RW Predator USB Drive
- ●●●½ LaCie USB CD-RW 4×4×24×

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- ●●●●½ DiskWarrior

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- ●●● Talk Now
- ●●● World Talk

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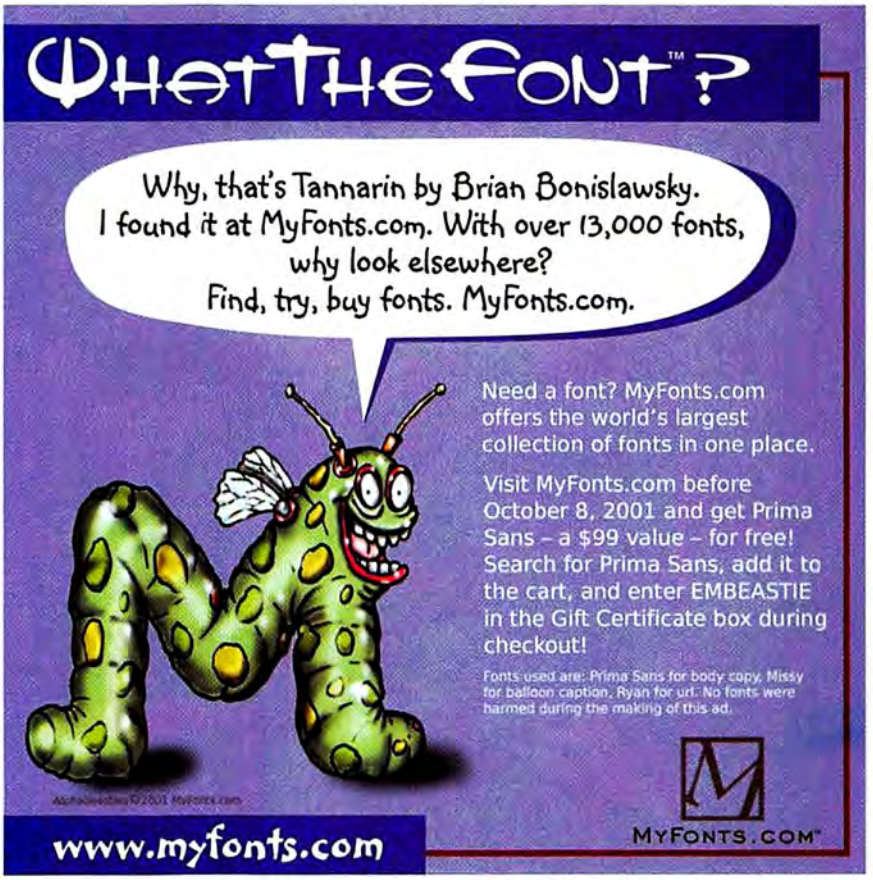
Game

- ●●● Rogue Spear

Reviews You Can Trust

RATINGS

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



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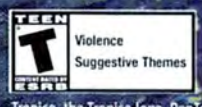

MacSoft

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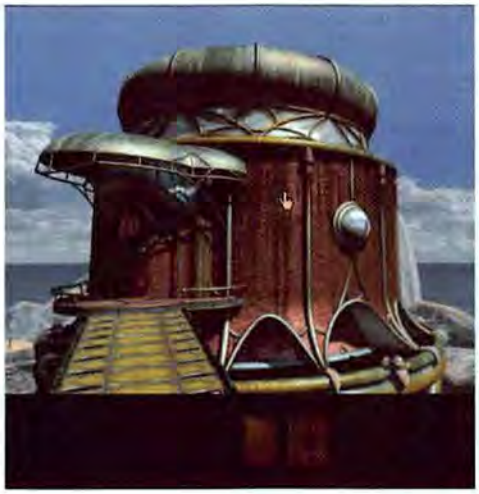
PETER COHEN

The Game Room

I've dreamed about only a few games, and Myst III: Exile is one of them. As I feverishly worked my way through it, a few of the puzzles gnawed on my subconscious like a hungry Squee munching on barnacle-moss flowers—more on Squees later. Suffice it to say that soon after I plunged into this game, solving its puzzles turned into a compulsion that gripped my mind both day and night.



Mystified

Unless you've been living in a cave since the early nineties, you've probably heard of Myst. Just in case you haven't, I'll say that it's a phantasmagorical adventure game set in a rich graphical environment. There are no foes to kill and no dragons to slay—just you, your imagination, and your problem-solving skills pitted against some of the most brain-twisting puzzles imaginable. And it has no specific instructions—as you explore the world of Myst, a story filled with intriguing characters unfolds.

Myst and its sequel, Riven, both produced by Cyan, are formidable phenomena in the game world. The two together have sold millions of copies, so development of new Myst games was inevitable. They're tough acts to follow, but Myst III: Exile is a worthy successor. Cyan, having moved on to other projects, handed over the production of Myst to Presto Studios, and Ubi Soft is publishing the game.

Myst's Rich Tapestry

Like Myst and Riven, Myst III: Exile shows exquisite production values—the environment is rendered with beautiful, lavishly detailed images. But Exile is even more realistic. Traveling through Myst and Riven was like watching a slide show: rather than moving freely through the landscape, you had to move one click at a time. This is true of Exile as well, but you can also look all around, above, and below—in a seamless, 360-degree panorama—with every click. Exile also supports OpenGL-based graphics, which add nice atmosphere. Ocean waves undulate and roll gently, for example, and as you manipulate objects that reflect or project light, you'll see the white-out of lens flare. The game features an engaging soundtrack that's thematically linked to the events in the game, so it never plays the same way twice. And if you turn away from a sound source, such as a character speaking, the sound grows fainter.

Mystaken Identity

Myst III: Exile picks up the story about ten years after the events in Riven. You follow the trail of Saavedro, an old colleague of Atrus, the man who created Myst, Riven, and many of the other Ages (or worlds) in which the games are set.

Atrus's evil sons devastated Saavedro's own Age, Narayan, and after losing his world, his people, and even his family, he goes mad—all he wants is revenge. You take the role of Atrus's dear friend, here to help Atrus recover the Age of Releeshahn. Saavedro hoped to trap Atrus in his web, but he got you instead. You're always one step behind Saavedro, trying to solve his dastardly puzzles and gather clues about what to do next.

Taking a cue from criticisms leveled at Riven, Presto carefully unfolds the story line in bits and pieces throughout the entire game, rather than dumping most of it at the beginning and end. One key to understanding what's going on is Saavedro's manuscript, which he drops page by page throughout the various Ages. You also receive a manu-

continues

TIPS **Mystified? Try your hand with these tips and tricks.**

- Myst III: Exile doesn't waste any opportunity—if you can interact with an object, chances are it's a key to one of the puzzles.
- Read Atrus's and Saavedro's journals carefully. They will give you insight into each character. Look carefully for the pages Saavedro has dropped, too—they're easy to miss.
- Note that the control mechanisms used by the telescopes in the J'Nanin observatory are the same as the controls you'll find inside some tusks.
- As you solve puzzles in Amateria, note the hexagonal designs and colors on top of the control panel covers. They're important in gaining access to the tower and activating what's within.
- The puzzles on Edanna are among the trickiest, because they're based primarily on natural forces that interact in subtle ways. Pay careful attention to the effects of light and water on Edanna's flora, and note that some of it can reflect and channel light.

script by Atrus, which will give you some background on what this author of Ages is doing and why it's so important for you to recover the Linking Book to the Age of Releeshahn, which Saavedro has taken. This process of discovery makes it rewarding to play the game all the way through, since you're always sure to gain enlightenment just around the next bend.

Play Mysty for Me

Spread across four CD-ROMs, Myst III: Exile is immense, and the puzzles you must solve are every bit as challenging as the ones in Riven and Myst—often more so. Most of them involve logic, a bit of computation, or visual perception. Often your challenge will be making sense of what's happening and then learning how to affect it.

To gain access to one key location, for example, you must build a bridge between yourself and the tower that contains a magical linking book. (Clicking on a linking book in any of the Myst games takes you to a different Age. Some books, however, turn out to be dead ends.) Constructing the bridge involves figuring out the relationship between Squees—furry, adorable, chirping creatures—the barnacle-moss flowers they like to eat, and the Hearken Fern, a huge plant with some unusual auditory characteristics. This whole process involves five distinct observations and interactions—and this is one of the easiest puzzles you'll find. Though this type of challenge is what makes the game so compelling, you may want to pick up *Myst III: Exile, Prima's Official Strategy Guide*, by Rick Barba (Prima Games, 2001), or at least visit some of the Myst fan sites on the Web for hints.

Each of the Ages has a unique style with particular challenges. One deals with energy phenomena such as electricity and steam; getting a generator online is a key part of solving this Age and moving to the next. Another Age, in contrast, deals with kinetic forces. In this one—which is my personal favorite—the puzzles all involve weights and balances, and one big honkin' roller-coaster ride. Yet another is a nature Age, where the puzzles take a more organic tone—you must make plants and animals interact in certain ways. And still another requires a good understanding of Atrus's cryptic shorthand.

No Exit? Don't take Saavedro too seriously. There is a way out, but it'll take some work.

Call Me an Optimyst

This challenging game may put off folks who don't have the time or patience to solve very intricate puzzles. And with four CDs, a fair amount of disc swapping is involved (a DVD version was in the works at the time I wrote this review, but I didn't have the opportunity to test it). Chances are, if you started out this column with a sarcastic "Yet another Myst game, whoopee," you should just move along—probably nothing here will interest you. For the rest of us, however, it's an immensely enjoyable and thoroughly engrossing experience.

Macworld's Buying Advice

Hats off to Presto and Ubi Soft for bringing out what could possibly be the best Myst game yet. Myst III: Exile brings the franchise to a new level, with sophisticated new effects, 3-D panoramic environments, and mind-bending puzzles. Though it's hard—maybe a bit too hard sometimes—ultimately the game is very rewarding. If you liked the first two Myst games, consider this a must-have. **m**

PETER COHEN, international man of mystery, is actually the very same person as Peter Cohen, MacCentral.com's senior editor.

Got a comment? Visit www.macworld.com/columns/gameroom/.

MYST III: EXILE

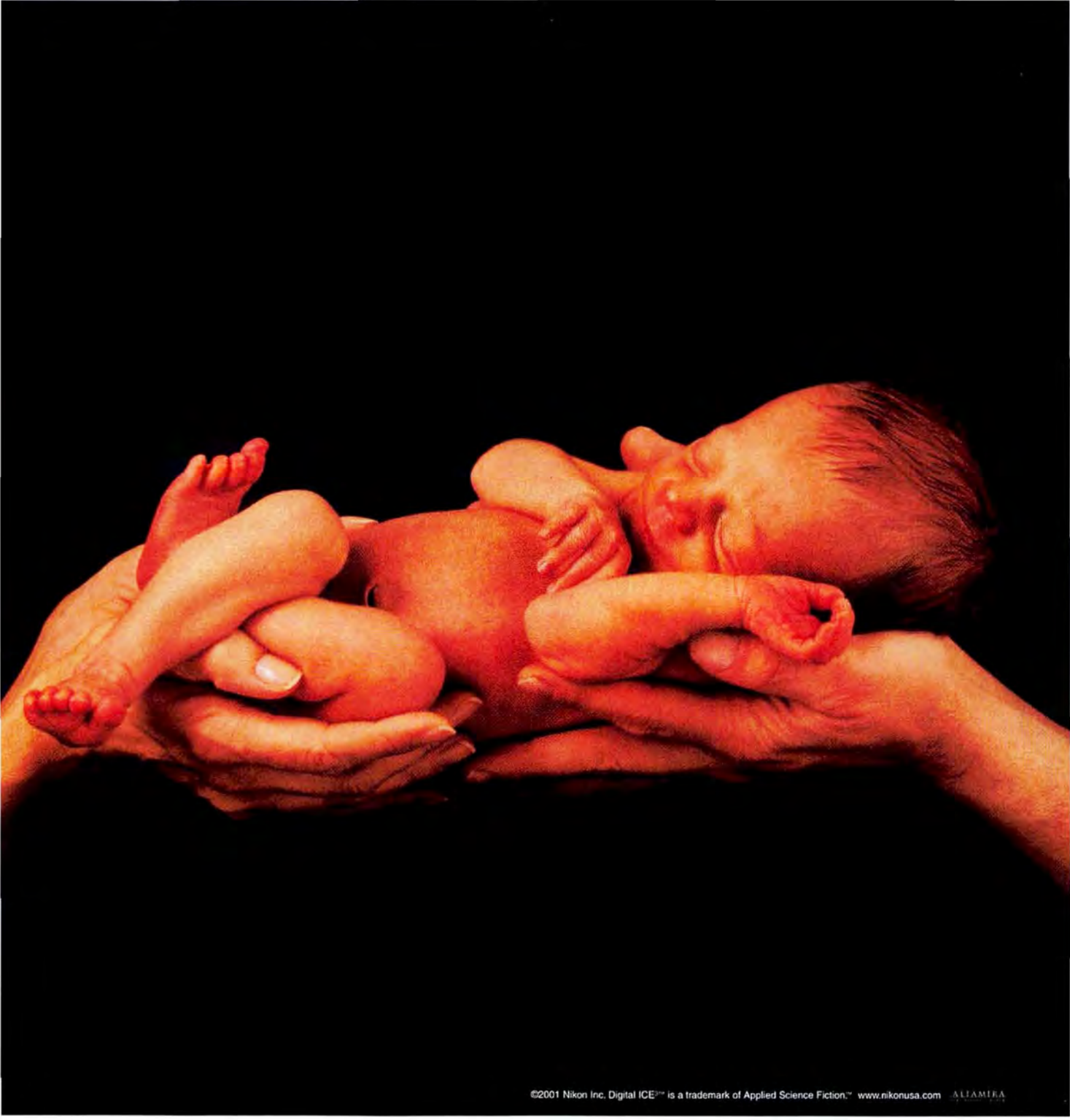
Rating: ♦♦♦♦½

Company's estimated price: $45

Pros: Beautiful graphics; engrossing story.

Cons: Puzzles may be too challenging for many players without outside assistance.

Company: Ubi Soft, **www.ubisoft.com**



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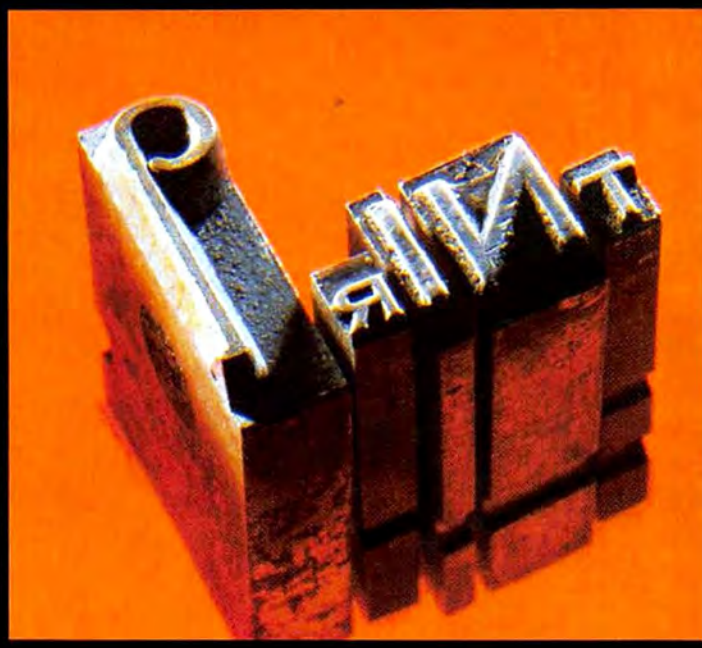

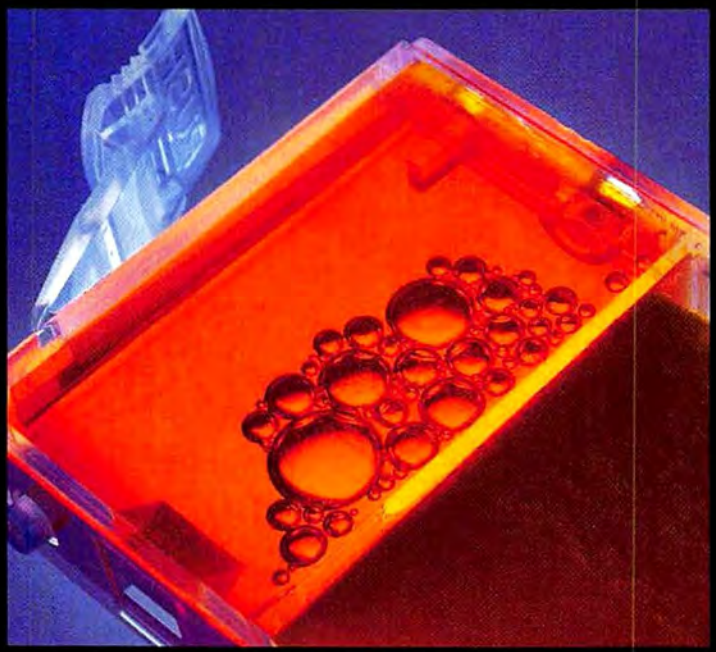

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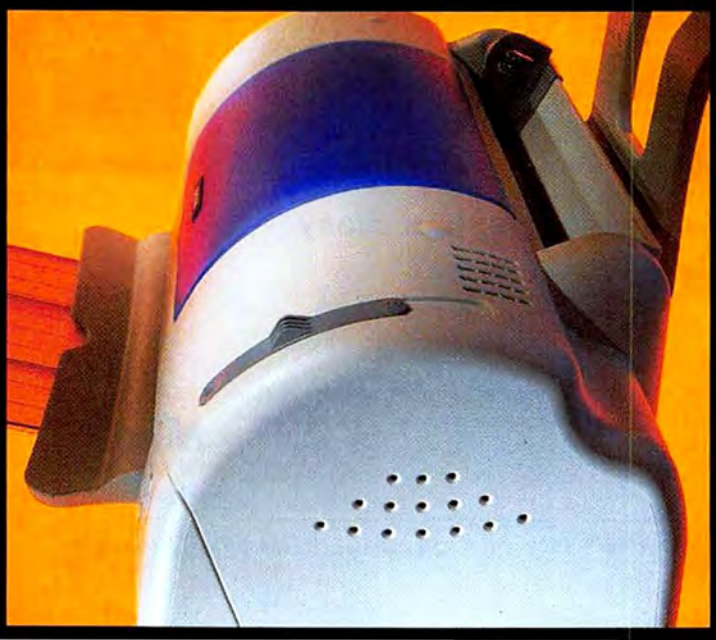
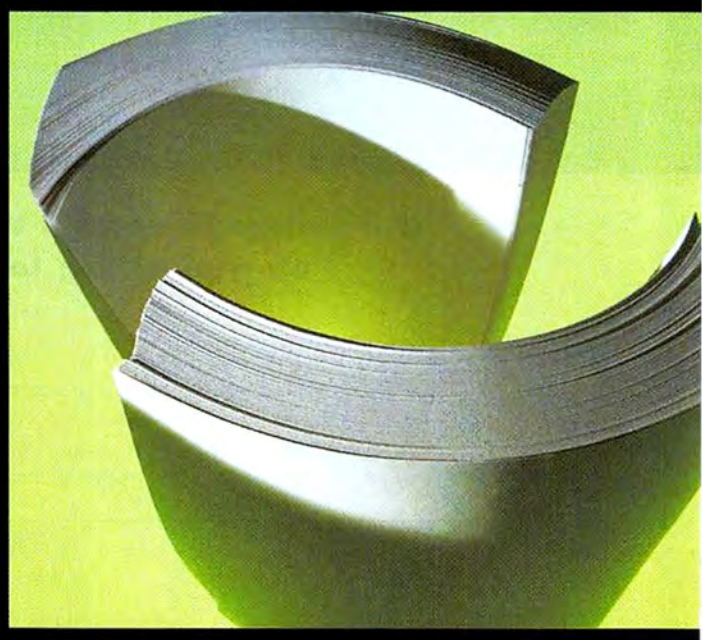
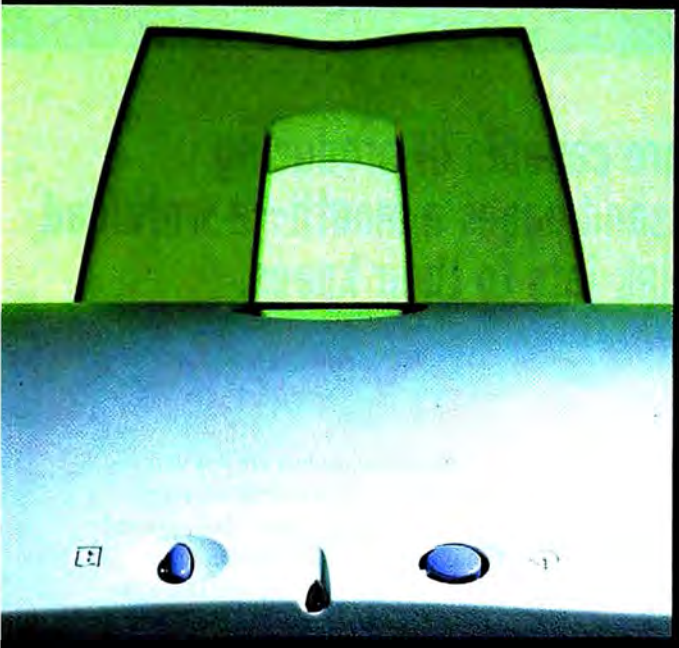






PRINTERS

MACWORLD'S ULTIMATE BUYERS' GUIDE

We Test 20 Printers—Both Ink-Jet and Laser—to Find the Right One for You

With the benefit of hindsight, we can laugh at pundits who predicted that computers would bring about the paperless office. If anything, new technology has made printers more important than ever, both at home and at the office. We use our personal printers to print out tax forms, maps, digital photographs, homework, recipes, e-commerce receipts, and much more. Home-office users, who depend on their equipment for their livelihoods, especially need reliable printers that can meet their needs without breaking the bank.

But as printer prices continue to plummet and the variety of models and options expands, finding the perfect printer becomes more challenging. Before you plunk down your hard-earned cash, you need to make sure you've chosen a printer that meets your specific requirements. There are a lot of factors to consider: Will the text be readable? Will your images look grainy? How fast will your pages print? How long will your printer last?

To help you through the labyrinth of choices, *Macworld* has put together this guide to purchasing your next printer. We examined three types of personal printer, each with different strengths and weaknesses: monochrome laser printers that cost less than $800, four-color ink-jet printers that cost less than $200, and photo-quality ink-jet printers that cost less than $500. We compiled buying advice and tips for each group, and then Macworld Lab put 20 of these printers to the test, to determine the best in each category. (For results, see "Seeing in Black and White," "Big Color for Small Budgets," and "Picture-Perfect Prints.")

BY BRUCE FRASER ■ PHOTOS BY KEVIN TWOMEY

Most laser printers are capable of producing several thousand pages a month—a workload that would bring most ink-jets to their knees.

CHOOSING A PRINTER TECHNOLOGY

Instead of wandering the aisles of your local computer store and trying to decipher the subtle differences among dozens of printer models, save yourself valuable time by first deciding what *type* of printer you need. Despite the overwhelming number of models, all printers are based on one of just a few basic technologies. The most common are laser printing and ink-jet printing, which has two varieties: four-color and photo-quality. Each has distinct advantages and disadvantages. If you understand how these technologies work, you can determine which best suits your needs. (For more help picking an appropriate printer technology, see "Four Questions to Ask Yourself before You Buy.")

Laser Printers

Monochrome laser printers have long been the workhorses of the printing world. Although limited to black-and-white output, they print significantly faster and sharper than ink-jet models, making them an excellent choice if you need to print long documents or have a heavy printing load.

Behind the Scenes When you send a file to your laser printer, a small laser inside the machine writes the image of the page onto a photosensitive drum, one row of dots at a time. Where the laser flashes, the photosensitive drum picks up a positive charge. As the charged drum rotates, it passes through negatively charged toner—basically, powdered black plastic—which then adheres to the charged spots on the drum. The toner is then transferred to a sheet of blank paper as the page passes beneath the rotating drum. Finally, the paper passes through a set of heated rollers that heats the plastic and fuses the toner to the paper. The result is sharp black marks resistant to smudging, water, and all but the most determined efforts to remove them.

Pros and Cons The laser printer's greatest advantage is speed. Its impressive printing rates are due to two features. First, its marking engine—the part of the printer responsible for putting marks on the paper—takes only a few seconds to complete its task. Second, almost all laser printers available for the Mac contain a RIP (Raster Image Processor). This is a dedicated on-board computer that converts incoming data to a *page bitmap*—an image of the page at the printer's resolution. Printers that lack RIPs, such as ink-jets, must rely on the host computer to calculate the page bitmap, tying up your computer each time you print a page. Printing takes longer, and your Mac is slowed during the job.

RIPs also give laser printers an edge in producing sharp graphics, because most RIPs are PostScript-compatible. PostScript lets a printer interpret and redraw shapes, characters, and curves with much greater precision when printing from PostScript-based applications such as Adobe Illustrator and QuarkXPress. Without a PostScript RIP to interpret the data, these applications are reduced to sending the monitor image to the printer, producing jagged, low-resolution bitmaps instead of smooth PostScript lines and curves.

But laser printers are less impressive when it comes to photo images. No one would mistake a laser-printed photograph for a darkroom print; the result is usually comparable to a good newspaper reproduction. And although color laser printers do exist, they're still rather expensive for personal use, starting at around $3,000.

Monochrome laser printers generally cost more up front than ink-jets, but their consumables (toner, for example) cost less. A page of text that costs 5 cents in paper and toner on a laser printer will probably cost double that—or more—in ink-jet consumables. Plus, most laser printers are capable of producing several thousand pages a month—a workload that would bring most ink-jets to their knees. Considering that a laser printer will typically last much longer than an ink-jet, it's an excellent option for printing-intensive environments such as a home office.

Ink-Jet Printers

If you want to print photographs, charts, or other color media, you're probably in the market for an ink-jet printer. Ink-jets, the most popular type of printer, have evolved from the noisy, slow beasts of yesteryear to sleek boxes that can print in color and in black-and-white. And as the technology has improved, prices have dropped; many ink-jets now sell for less than $100. Although they're significantly slower and more expensive to run than monochrome laser printers, ink-jets offer flexibility that's hard to beat.

Behind the Scenes Ink-jet printers use tiny drops of cyan, magenta, yellow, and black inks (together referred to as CMYK colors) to produce color prints. Placed next to one another in different patterns, these inks simulate a full range of colors.

Most ink-jet printers use one of two technologies to expel the ink droplets from the print head. Thermal (or Bubble Jet) technology uses heat, while Piezo technology employs small electronic crystals to create vibrations. Both methods are capable of producing excellent results. The most important difference is that inks developed for Bubble Jet printers can't be used in Piezo printers, and vice versa.

There are two types of color ink-jet printer on the market: four-color ink-jets, which are typically designed to be all-purpose printers, and six-color ink-jets—or photo printers—which are designed for high-quality photographic output. The quality of color output you require and the amount you're willing to spend will determine which is right for you.

Pros and Cons: Four-Color Ink-Jets These ink-jets are at home printing monochrome text or color graphics. They print to a variety of paper sizes and types, and their initial purchase price is easy on the wallet.

But this flexibility comes with trade-offs. Ink-jets can't approach the speed of laser printers. Since they rely on the host computer to do all the processing, some time may elapse between when you click on a print button and when the printer starts printing. Simple text documents print fairly quickly—ten pages in two to five minutes on the models we tested. But print speeds for high-resolution photographic images dragged significantly: it can take some ink-jet printers 16 minutes to produce a single high-resolution image.

An ink-jet printer's low initial cost is one of its main attractions, but it's important to factor in the ongoing expense of operating it. The per-page cost of ink-jet printing is generally higher than that of laser printing, often more than twice as high.

continues

Four Questions to Ask Yourself before You Buy

Since no type of printer is right for everyone—or every job—it's important to match your needs with a printer's abilities. Consider what you require, what you'd like, and what's irrelevant to you. Start by answering the following questions:

What Do I Plan to Print?
In choosing a printer technology, first think about the types of documents you'll print. If you need PostScript output, for page layouts from QuarkXPress, for example, you must buy a printer that contains a PostScript interpreter. Most laser printers come with these; ink-jets do not, and adding a PostScript RIP to an ink-jet printer is a significant expense.

If you *absolutely* need to print color documents, get an ink-jet printer. If color is desirable but not essential, you should weigh the advantages of a laser printer's speed and longevity against an ink-jet printer's low initial cost and flexibility.

Avoid buying a photo printer unless you primarily print photographs. These printers are highly specialized, and if you use them regularly for other kinds of documents, you won't be getting your money's worth.

Will I Connect My Printer to a Network?
If you need to share a printer among several machines—in a home office, for example—laser printers are a good choice, because they're generally easier to network than ink-jets. Many laser printers have built-in Ethernet capabilities, and those that don't usually offer an Ethernet option.

Ink-jet and laser printers without an Ethernet option can use Apple's USB Printer Sharing software, which is included in Mac OS 9.1. (OS 9.0 users can download it from Apple's Web site.) USB Printer Sharing is more complicated to set up than Ethernet, and to print, the host computer must be turned on. Plus, printing to an ink-jet over such a network can significantly slow down the host computer.

Do I Want to Print on Both Sides of the Paper?
Ink-jet printers rarely offer automated duplex printing. But you can produce double-sided output manually with just about any model—provided you use paper designed for the purpose. It can be a hassle—you have to print all the odd-numbered pages, flip the printed pages, reload them, and then print the even-numbered pages.

You may be tempted to try the same thing with a laser printer. Don't. Unless the laser printer is designed for duplex printing (it will say so in the product guide), you can damage it by getting melted toner on the fuser rollers. However, laser printers that offer duplex printing as a feature generally do so quickly and automatically, making your life a lot easier.

How Soon Can I Afford to Replace My Printer?
It's worth bearing in mind that PostScript laser printers are much less likely than ink-jet printers to become obsolete. There are plenty of ten-year-old laser printers happily cranking out pages. The same can't be said of ink-jets, which are still evolving dramatically. Any ink-jet printer you can purchase today will probably start looking a bit long in the tooth in three years or so.

SEEING IN BLACK AND WHITE

COLOR IS GREAT—but it's not right for everything. When it comes to reading text, for example, the eye prefers the simplicity of black ink on white paper. While color ink-jet printers are affordable and can print both black and color ink, their text output is never perfectly crisp. If you need sharp text that doesn't strain the eyes, and you don't have a lot of time to wait for documents to meander through a printer, nothing beats the quality and speed of a monochrome laser printer.

Macworld Lab tested six monochrome laser printers priced below $800 and designed with home offices and small work groups in mind: the Brother HL-1270N and HL-1670N, the Hewlett-Packard LaserJet 1200se, the Lexmark Optra E312 and Optra M412n, and the Samsung ML-6060. After testing each printer's speed and output quality, we judged the Brother HL-1670N to be the best overall value.

Brother HL-1670N

Getting Connected

If you're sharing a monochrome laser printer among more than one computer, you'll need to connect it to a network. The HL-1270N, HL-1670N, and Optra M412n all include 10/100BaseT Ethernet ports. Brother takes the HL-1670N's networking features to another level by including a built-in Web server that allows remote administration of networked printers via a Web browser. To connect the Optra E312, the ML-6060, or the LaserJet 1200se to a network via Ethernet, you must first install an upgrade card, an option that will cost from $179 (for the ML-6060) to $255 (for the Optra E312)—more than half the price of the printer.

Of course, printers without Ethernet capabilities can still be networked using Apple's USB Printer Sharing software. However, setting them up that way can be more complicated. (See "Four Questions to Ask Yourself before You Buy.")

Speed and Power

Printer speeds advertised by a manufacturer do not include the time it takes to process and start printing the first page. A printer may take up to three minutes to process an image before a sheet of paper is pulled from the tray. The complexity of a document, the amount of memory installed in the printer, the power of the printer's internal processor, and the resolution settings all affect how quickly it will print. In general, the more RAM installed in a laser printer, the larger the file it can print. Likewise, the stronger the processor, the faster the printer starts printing. For example, the Optra M412n, with its 137MHz RISC processor, printed an Adobe Photoshop document in less than half the time it took its sibling, the 67MHz-processor E312.

Macworld Lab's time tests begin when the print button is clicked on and end when the last page drops into the paper tray. On each of the printers we reviewed, we printed a ten-page Microsoft Word 2000 document at a resolution of 600 dpi. The Optra M412n finished first, in just 48 seconds. The Optra E312 came in last, taking 1 minute and 17 seconds.

Although none of these printers had problems printing our Microsoft Word documents at their highest resolution setting, graphic-intensive documents considerably slowed down some models. In our Photoshop speed test, the Optra M412n completed the page in a stunning 56 seconds. But three of the printers—the HL-1270N, the Optra E312, and the ML-6060—weren't able to print our Photoshop document at all until we purchased and installed additional memory. We found a $49 16MB upgrade for the HL-1270N printer on Crucial Technology's Web site (www.crucial .com). Lexmark sent a 32MB upgrade for its E312 model, at a cost of $289. However, through Crucial Technology we found a comparable module for $81—which also worked in the ML-6060. All of the memory upgrades came with easy-to-follow installation instructions.

Monochromes Measure Up

Macworld LAB TEST

Best results in bold.
▬ Shorter is better.
●●● Excellent ●● Acceptable ● Poor

	MICROSOFT WORD 2000	ADOBE PHOTOSHOP 6.0.1		PRINT QUALITY			
	Text Document	High Resolution	Low Resolution	Text	Photographic Image	Gradients	Fine Lines
Brother HL-1270N	1:07	5:50	5:26	●●●	●●●	●●	●●
Brother HL-1670N	0:54	4:56	4:34	●●●	●●	●●	●●
Hewlett-Packard LaserJet 1200se	0:58	4:16	3:23	●●●	●●	●●	●●
Lexmark Optra E312	1:17	1:59	1:57	●●	●●	●●	●●
Lexmark Optra M412n	0:48	**0:56**	**0:52**	●●●	●	●●	●●
Samsung ML-6060	1:03	3:40	2:50	●●	●	●●●	●
	◀ Better	◀ Better	◀ Better				

Speed-test results are in minutes:seconds. We printed a ten-page Word document, a 22MB Photoshop image (both at each printer's highest resolution and at 600 dpi), and a 748K PDF file using Adobe Acrobat 4. We measured times from the moment the print button was clicked on to the moment the last page fully emerged from the printer. We set Photoshop's memory partition to 75MB. Our test system was a Power Macintosh G4/500 with 128MB of RAM, Mac OS 9.1 installed, and virtual memory enabled. Macworld Lab conducted subjective tests in which a jury of experts rated each printer's output quality as excellent, acceptable, or poor.—Macworld Lab testing by James Galbraith

Image Quality

When we tested text sharpness, the HL-1270N, HL-1670N, LaserJet 1200se, and Optra M412n all produced crisp, easy-to-read pages. Text from the Optra E312 was sharp but slightly heavier than the other samples. The ML-6060's text was slightly less sharp but still acceptable. To evaluate each printer's image quality, we printed a high-resolution Photoshop file and a PDF document with graphical elements including fine curved lines, horizontal and vertical gradients, and photographic images. The HL-1270N produced the best overall image quality, with excellent photo images, plus good fine lines and gradients. The HL-1670N also performed well, scoring a bit lower for photo quality, but still producing acceptable gradients and fine lines.

The photo images produced by the Optra M412n were grainy, with visible horizontal lines. The Optra E312 did slightly better, with fewer horizontal lines and cleaner images. The ML-6060 produced the best gradients of any of the printers, but there were obvious breaks in the fine lines, and its Photoshop document was very light. (This printer offered no means of controlling the toner's density, unlike Lexmark's printers, which have settings in the drivers.)

The LaserJet 1200se didn't print the Photoshop test document at all initially. Instead, it spit out twenty pages, each with only a single line of characters across the top. After changing the default Binary setting to ASCII, the printer performed well across the board in the Photoshop tests, but a Mac printer should print Photoshop documents without requiring a change to default settings. (All HP printers using USB have this problem; at press time, HP said it was working on a bug fix.)

Powering PostScript

All of these printers except the ML-6060 ship with some type of emulated support for PostScript so they can interpret lines and text from PostScript-based applications such as Adobe Illustrator and QuarkXPress.

The LaserJet 1200se, HL-270N, and Optra E312 offer PostScript 2 emulation. The Optra M412n and HL-1670N include PostScript 3 emulation, which supports more levels of gray, for smoother images, and includes more fonts than PostScript 2.

Without a $199 PostScript 3 upgrade (which includes an 8MB RAM upgrade), the ML-6060 must use the included PCL drivers, resulting in blurry, blotchy images when printing Photoshop, XPress, and PDF documents. With the upgrade installed, the ML-6060 was able to print much sharper images at 1,200 dpi.

Resolution Revolution

The Lexmark and Brother printers produce a maximum 600-by-600-dpi output, but both companies employ a resolution-enhancement technology that purports to pump up image quality to that of a 1,200-dpi printer. Indeed, in our tests the Brother printers produced clear, high-quality graphics using the enhancement technology. However, we had a hard time distinguishing between the Lexmark printers' regular and enhanced output. The companies also claim that their "enhanced" printers can print faster than printers with a real dpi count of 1,200, but we recorded only a slight advantage in our tests.—JAMES GALBRAITH

EDITORS' CHOICE

●●●● Brother HL-1670N This laser printer delivers the best overall value. Though slower than the same-price Lexmark Optra M412n, the HL-1670 produces better image quality and features built-in duplexing and Web-based administration tools.
Company: Brother (800/276-7746, www.brother.com)
Company's estimated price: $749

"Photo printers are fine for occasional text jobs, but if you regularly need both text and photo output, you're better off buying two printers."

When it comes to image quality, all-purpose ink-jet printers are a mixed bag. They can produce black-text documents, but many can't match the sharpness of a laser printer. And since ink-jet printers rarely have a built-in PostScript RIP, they print documents from PostScript-based applications as monitor-resolution bitmaps. Software and hardware RIPs are available for some ink-jet printers, but they generally cost several times more than the printer itself.

If you're looking to produce photographic output, today's all-purpose ink-jets print decent images from scanners or digital cameras. Their main limitations are poor highlight detail and obvious dot patterns. While some printers can produce magazine-quality photographs, others print high-contrast, oversaturated images that, although recognizable, are hardly pleasing.

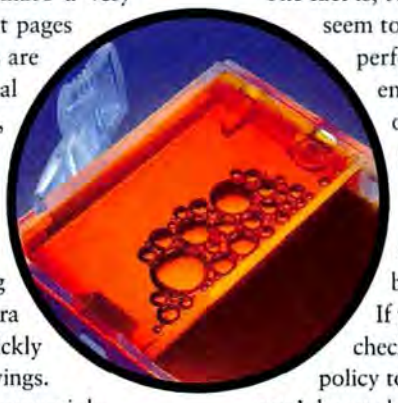
Pros and Cons: Photo Printers

Four-color ink-jets' shortcomings have inspired a new generation of printers that can truly claim to produce photo-realistic images. Photo printers typically feature finer dot patterns than their general-purpose siblings, yielding the continuous gradations of tone and color found in photographs. Of course they're also more expensive; the models reviewed in this guide range in price from $199 to $499 (even-costlier larger-format photo printers are also available).

To achieve better highlight detail, most photo printers use two extra inks—light cyan and light magenta—with the regular CMYK colors. The light cyan and magenta dots are invisible to the naked eye, adding to the illusion of continuous tone.

When photo ink-jets first appeared, consumers' main concern was image quality. A testament to the growing maturity of the technology, their major concern today is not how good a print will look but how long it will last. If printed on suitable paper and handled correctly, images made with today's long-lasting inks can have a lifetime similar to that of a conventional photographic print.

For photographic output on specialty paper, you can expect to spend upward of 50 cents to produce a single 8-by-10-inch image (which still compares very favorably with the cost of traditional darkroom prints). In a pinch, photo printers *can* produce other types of output, such as text documents. But since the inks they use are substantially costlier than those made for general-purpose ink-jets, and since photo printers are designed to lay down more ink, that's a very expensive way to print pages of text. Photo printers are fine for the occasional non-photographic job, but if you regularly print both text documents and photographic images, you'll be better off buying two printers. The extra cost up front will quickly be recovered in ink savings.



As with general-purpose ink-jets, photo printers do not contain a built-in RIP. But then, you don't need a RIP for photographic work. It's a consideration only if you work with layout or illustration programs, and again you'd probably be better off getting a second printer for that purpose.

Making the Choice

When you choose a printer, consider the type, quantity, and quality of documents you need to produce. You may have to make compromises—say, if you need color from an ink-jet *and* the high volume of a laser printer. And there are other considerations: laser printing is a mature technology that's unlikely to undergo sweeping changes, so you can reasonably expect a laser printer to provide good service for a decade. Ink-jet printers, though more flexible, are still evolving, and the ink-jet you buy today is likely to seem antiquated in two or three years.

FINDING THE PERFECT PRINTER

Even after you've settled on a type of printer, choosing a specific printer in that category can be a headache. You must sort through dozens of vendors and an ever changing list of models.

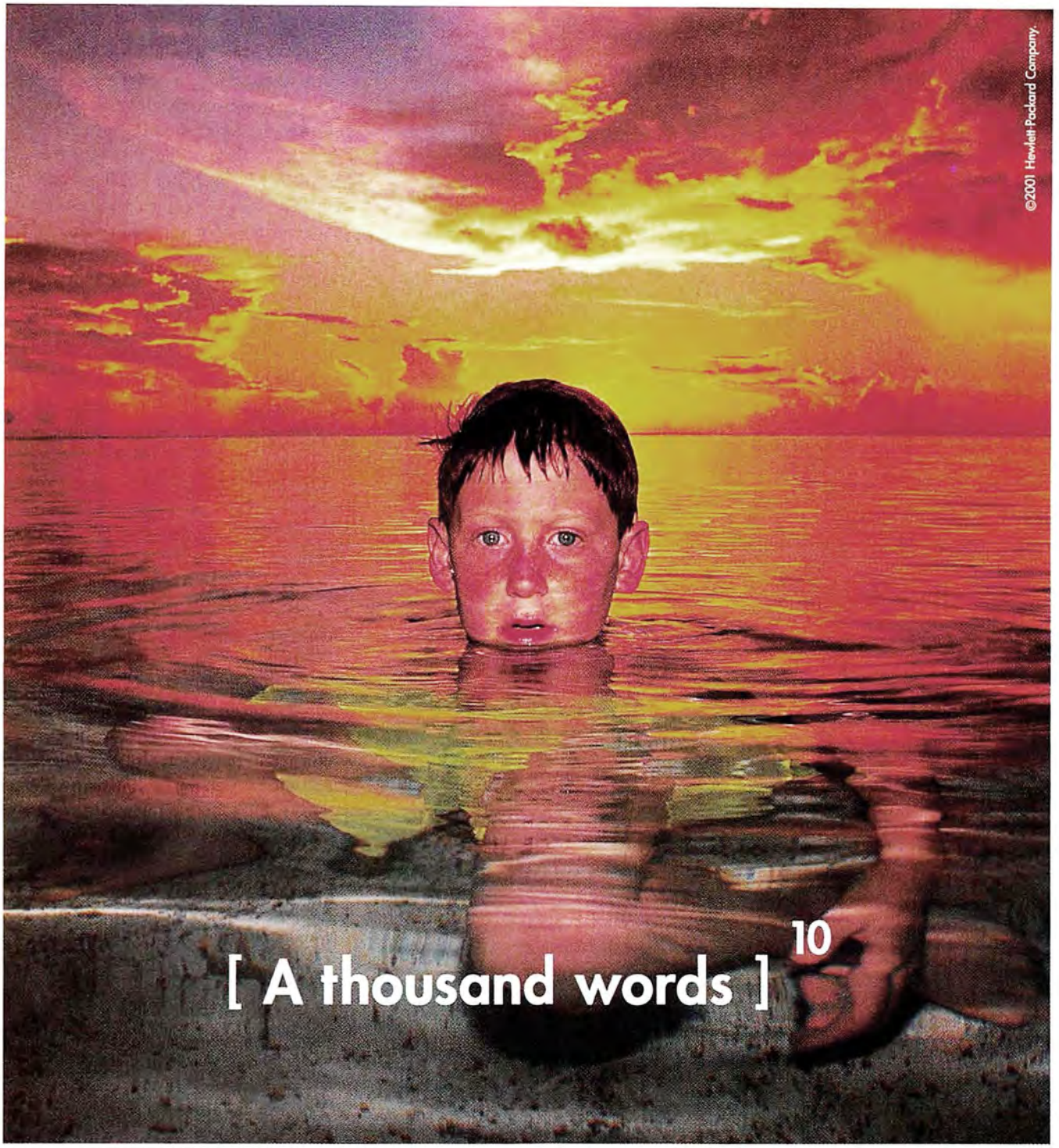
The fact is, two printers that seem to be identical may perform quite differently. The true test of any printer is the quality of the print. If it's at all possible, look at sample output before you buy. If you can't do that, check the store's return policy to make sure you won't be stuck with a dud. (For examples of common image problems, see "Looking at the Fine Print.")

Choosing Your Laser Printer

If you've decided to go with a laser printer, consider the following factors.

Print Quality Don't judge print quality solely by text output unless text is all you care about. Most laser printers produce very similar-looking

continues



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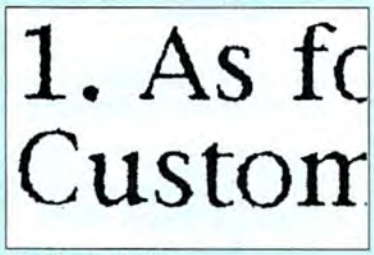
Looking at the Fine Print

When you're choosing an ink-jet printer, the manufacturer's specifications—such as resolution, speed, and ink-droplet size—tell you only so much. To be certain that your new printer will be satisfactory, you have to print a document and see what comes out. But exactly what constitutes a *bad* print? To help you identify potential problems, we gathered both good and bad samples from our own testing. Here are three important areas to consider:

Bad: Xerox DocuPrint M760

Good: Epson Stylus Color 777i

Continuous Tone One of the most important factors in a good print is the absence of obvious dots. Widely spaced or large drops of ink can give photographs an impressionistic feel and deprive the image of important detail. Examine shadow and highlight areas; they should appear smooth and natural.



Bad: Canon S600

Good: Lexmark Z32

Text Sharpness If you anticipate printing letters, homework, or any other text-heavy documents on your ink-jet printer, print a sample on nonglossy ink-jet-quality paper before you purchase one. Because ink tends to bleed when applied to paper, text often appears blurred. Pay particular attention to curved letters such as *S* and *e*, and make sure that lines are not broken or fuzzy to the point of being unreadable.

Bad: Lexmark Z32

Good: Epson Stylus Color 777i

Color Fidelity Judging a print's color accuracy is probably the most difficult test of a good printer. Stores seldom offer a color-corrected proof with which to compare your test print. Nevertheless, you should always scrutinize your test output for potential color problems. Make sure skin tones look natural, not washed out or cartoonish.

type (see "Monochromes Measure Up"). But be sure your printer can handle type correctly and doesn't cut words off at the margins.

What distinguishes laser printers is their ability to print fine lines and shades of gray. A print's gradations of gray should be smooth without noticeable bands, and photographs should reproduce at least as well as they do in your morning newspaper. Also check thin lines to see if they break or jump.

Speed Keep in mind that the print speeds listed by the manufacturer—measured in pages per minute (ppm)—usually bear little relation to real-world conditions. The advertised speed is the speed at which the printer can output multiple copies of the same page once the image has been processed by the RIP. Unless you're printing dozens of copies of the same page, you're unlikely to achieve that speed.

In the real world, a laser printer's speed depends heavily on the RIP. In general, the printer spends much more time converting the data to a page bitmap than it does actually putting the toner on the paper, especially for complex PostScript files. Unfortunately, it's difficult to compare processor speeds unless you stand by each printer with a stopwatch. So if speed is important to you, be sure to check recent reviews for more-realistic rates.

Resolution The advertised resolution—measured in dots per inch (dpi)—can also be misleading. Resolution refers to the number of addressable dots—the number of places where the printer can choose to print a dot. But you seldom get the maximum available resolution, because toner can scatter, and it spreads a little when it's fused to paper. So the actual resolution—the degree to which the printer can resolve fine detail—is always lower than the stated resolution, sometimes much lower.

To counteract this problem, some laser printers offer multiple resolu-

continues

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BIG COLOR FOR SMALL BUDGETS

MOST CREATIVE SOULS thirst for color but don't need the photo-realistic output of a high-end (and high-cost) photo printer. Fortunately, there's an alternative: consumer-level color ink-jet printers. Also known as business ink-jets, these printers can cost as little as $89. Although these models, which use four ink colors, can produce photographic images, the gradients they print aren't as smooth as those of specialized photo ink-jets, which often use six (see "Picture-Perfect Prints"). But if you want the flexibility of printing text documents, colored charts, and the occasional photograph with one printer, then a four-color ink-jet may have your name on it.

Hewlett-Packard DeskJet 935c

We rounded up nine ink-jet printers that cost less than $200: Canon's S450 and S600; Epson's Stylus Color 777i and Stylus Color 880i, Hewlett-Packard's DeskJet 842c and DeskJet 935c, Lexmark's Z32 and Z42, and Xerox's DocuPrint M760. Macworld Lab printed text documents and photographic images on each, measuring speeds and comparing printed results side-by-side. In the end, the DeskJet 935c offered the best compromise between speed and image quality.

Setting Up Shop

The printers from Canon, Epson, and HP were all very easy to set up, thanks to large, Mac-specific, step-by-step guides. Although Lexmark doesn't provide such a guide, setup for its Z32 was very straightforward. Unfortunately, the Z42 is much less Mac-friendly; the URL listed for downloading Mac drivers was broken when we tried it. Only by performing a search on Lexmark's Web site could we find the 2.7MB download. Xerox was even less accommodating for its DocuPrint M760. The packaging, Quick Reference, and Getting Started documents suggest only Windows compatibility, and the setup diagram doesn't offer Mac-specific instructions. A single sentence buried in the diagram's introduction lists a URL for Mac drivers.

Inks and Paper

All these printers can accommodate legal- and letter-size paper, as well as smaller formats such as envelopes. With the models from Canon, Epson, and Lexmark, you load paper into a slot at the top of the printer, and finished prints fall into a tray at the bottom. The printers from HP and Xerox have a much sturdier paper-transport mechanism: they draw paper from an enclosed cassette at the bottom of the printer and deliver your completed prints to a tray directly above the cassette. This design protects paper from outside agents such as dust and curious felines. But if you are short on desk space, you might prefer the top-loading models, which allow you to remove the bracket that supports blank paper and then fold up the receptacle tray.

Although ink-jet printers are very inexpensive, money spent on ink cartridges can quickly add up. The DeskJet 935c is the most economical of this group, with an estimated per-print cost of roughly 6 cents for color output, not including paper (see "The Big Picture"). In contrast, the Z42 has an estimated per-print cost of 14 cents. When printing black only, the S450, S600, and DeskJet 935c are the least expensive, about 3 cents per print, while the Stylus Color 777i and Z32 cost about 7 cents per print.

The Canon and Xerox printers all use a more practical approach to ink cartridges than traditional models: the ink tanks are separate from the print heads, and each color has a separate tank. So if you print a lot of black text and a single color (say, magenta), you don't need to replace the whole set of inks when just one runs out. The Lexmark inks produced an unpleasant odor during printing, though the odor disappeared after the ink dried.

The Fine Print

To judge image quality, we printed high-resolution photos at the printer's highest-quality settings on the paper recommended by each vendor. The printers produced some impressive prints, but each displayed at least one defi-

Colorful Competition

Macworld LAB TEST

Best results in bold.
▬ Shorter is better.
●●● Excellent ●● Acceptable ● Poor

	MICROSOFT WORD 2000	ADOBE PHOTOSHOP 6.0.1		HIGH-RESOLUTION PHOTO		LOW-RES. PHOTO	GRAY SCALE	TEXT
	Text Document	High Resolution	Low Resolution	Color Fidelity	Continuous Tone	Image Quality	Neutrality	Sharpness
Canon S450	1:50	16:36	2:25	●	●	●●	●●	●
Canon S600	1:53	8:30	1:04	●●	●●	●●	●●	●
Epson Stylus Color 777i	4:09	14:20	**0:32**	●●●	●●●	●	●●	●
Epson Stylus Color 880i	1:47	14:50	0:33	●	●●●	●	●	●
Hewlett-Packard DeskJet 842c	5:08	14:50	1:21	●●	●●	●●●	●●	●●
Hewlett-Packard DeskJet 935c	3:38	11:10	1:02	●●●	●●	●●●	●●	●●
Lexmark Z32	4:45	9:34	1:46	●	●	●●	●	●●●
Lexmark Z42	2:31	12:20	1:29	●	●	●●	●●	●●●
Xerox DocuPrint M760	2:50	**5:00**	1:19	●	●	●●	●	●
	◀ Better	◀ Better	◀ Better					

Speed test results are in minutes:seconds. We printed a ten-page Word document, both a 22MB high-resolution and a 100K low-resolution Photoshop image, and a 748K PDF file using Adobe Acrobat 4. We measured times from the moment the print button was clicked on to the moment the last page fully emerged from the printer. We set Photoshop's memory partition to 75MB. Our test system was a Power Macintosh G4/500 with 128MB of RAM, Mac OS 9.1 installed, and virtual memory enabled. Macworld Lab conducted subjective tests in which a jury of experts rated each printer's output quality as excellent, acceptable, or poor.—**Macworld Lab testing by Jeffy K. Millstead**

ciency. The Stylus Color 777i and Stylus Color 880i both produced fine, smooth prints with good continuous tone. Prints from the DocuPrint M760, S450, Z42, and Z32 were much coarser, with obvious dots. (The other printers fell somewhere between.) In general, the printers with higher resolutions produced better continuous tone. The one exception was the DeskJet 842c, which despite a relatively low resolution of 600 by 1,200 dpi produced smoother output than the Z42, which supports 2,400-by-1,200-dpi resolution.

When we compared the printers' color output with our original test image, the DeskJet 935c was the most accurate, with the Stylus Color 777i following close behind. Prints from the Stylus Color 880i and the S450 were oversaturated and contained an excess of yellow, resulting in unrealistic skin tones. Output from the Z32, Z42, and DocuPrint M760 appeared pale and washed out.

We also looked at each printer's ability to produce a gray-scale image without perceptible color. When printing gray-scale, ink-jets use a bit of color to help round out the gradients between subtle shades of gray. Most of the printers were able to reproduce fairly neutral grays with only a subtle color cast. The exceptions were the DocuPrint M760, the Stylus Color 880i, and the Z32, whose grays were noticeably tinted red, green, and blue, respectively.

The Text Factor

If you use your printer for tasks other than color printing—letters or schoolwork, for example—legibility is important. The Lexmark printers produced the sharpest text on plain paper, with only minor bleeding along the grain. The DeskJet 842c and DeskJet 935c were almost as sharp as the Lexmark printers, while the other printers showed fuzziness typical of ink-jets: bleeding around the letters and subtle, arbitrary variations in stroke thickness. The most striking flaw was with the S450, which cut off text along the right margin.

The Race Is On

When printing text, the Canon printers and the Stylus Color 880i were the fastest of the group, cranking out a ten-page Microsoft Word document in less than two minutes. In contrast, the DeskJet 842c was downright sluggish, taking a little more than five minutes. When printing high-resolution Adobe Photoshop images at highest-quality settings, the DocuPrint M760 took a significant lead, printing a 22MB file in five minutes. The second fastest was the S600, which took eight and a half minutes to print the same image. The slowest printer in this test—the S450—took more than 16 minutes. Of course, if image quality isn't a priority—if you're printing from the Web or for proofing, for example—you can cut printing time significantly by outputting your graphics at a lower resolution. Almost all of the printers were able to produce a low-resolution image in less than a minute and a half. (The Epson printers accomplished the task in just over 30 seconds.) Even the slowest printer, the S450, took less than two and a half minutes.—DAVID WEISS

EDITORS' CHOICE

●●●● **Hewlett-Packard DeskJet 935c** The overall winner—and the most well-rounded ink-jet printer in the group—it produced eye-pleasing, color-accurate graphics at reasonable speeds.
Company: Hewlett-Packard (800/752-0900, www.hp.com)
Company's estimated price: $199

20 Monochrome Laser and Ink-Jet Printers Compared

COMPANY	PRODUCT	MOUSE RATING	ESTIMATED PRICE (AS TESTED)	CONTACT	MAXIMUM RESOLUTION (IN DPI)	CONNECTION	MEMORY (AS TESTED, IN MB)	MAC OS X READY?
MONOCHROME LASER PRINTERS								
Brother	HL-1270N	4	$548[B]	800/276-7746 www.brother.com	600 × 600	Ethernet, USB	20MB	yes
	HL-1670N ★	4	$749	800/276-7746 www.brother.com	600 × 600	Ethernet, USB	16MB	yes
Hewlett-Packard	LaserJet 1200se	3½	$399	800/752-0900 www.hp.com	1,200 × 1,200	USB	8MB	yes
Lexmark	Optra E312	3½	$688[C]	888/539-6275 www.lexmark.com	600 × 600	USB	36MB	yes
	Optra M412n	3½	$749	888/539-6275 www.lexmark.com	600 × 600	Ethernet, USB	8MB	yes
Samsung	ML-6060	2½	$568[D]	201/229-4000 www.samsung.com	1,200 × 600	USB	12MB	no
FOUR-COLOR INK-JET PRINTERS								
Canon	S450	2½	$149	800/652-2666 www.usa.canon.com	1,440 × 720	USB	N/A	yes
	S600	3½	$199	800/652-2666 www.usa.canon.com	2,400 × 1,200	USB	N/A	yes
Epson	Stylus Color 777i	3½	$79	800/873-7766 www.epson.com	2,880 × 720	USB	N/A	yes
	Stylus Color 880i	3	$129	800/873-7766 www.epson.com	2,880 × 720	USB	N/A	yes
Hewlett-Packard	DeskJet 842c	3	$119	800/752-0900 www.hp.com	600 × 1,200	USB	N/A	yes
	DeskJet 935c ★	4	$199	800/752-0900 www.hp.com	2,400 × 1,200	USB	N/A	yes
Lexmark	Z32	3	$99	888/539-6275 www.lexmark.com	1,200 × 1,200	USB	N/A	yes
	Z42	3	$149	888/539-6275 www.lexmark.com	2,400 × 1,200	USB	N/A	yes
Xerox	DocuPrint M760	2½	$149	800/349-3769 www.xerox.com	1,200 × 1,200	USB	N/A	no
PHOTO-QUALITY INK-JET PRINTERS								
Canon	S800	3½	$299	800/652-2666 www.usa.canon.com	2,400 × 1,200	USB, parallel	N/A	yes
Epson	Stylus Photo 780 ★	4½	$149	800/873-7766 www.epson.com	2,800 × 720	USB, parallel	N/A	yes
	Stylus Photo 1280	4	$499	800/873-7766 www.epson.com	2,800 × 720	USB, parallel	N/A	no
Hewlett-Packard	Photosmart 1218	4	$499	800/752-0900 www.hp.com	2,400 × 1,280	USB, parallel, SmartMedia, CompactFlash, IrDA	N/A	no
Kodak	Personal Picture Maker 200	2½	$199	800/235-6325 www.kodak.com	1,200 × 1,200	USB, SmartMedia, CompactFlash, Zip drives via USB	N/A	no

★ = **Editors' Choice.** N/A = not applicable. [A] Results for laser printers are based on 5 percent ink coverage. Results for ink-jet printers and photo printers are based on 5 percent coverage for black ink and 15 percent coverage for color ink. Cost of paper is not included. [B] Price reflects $499 base price plus 16MB upgrade required to print large files. [C] Price reflects $399 base

Brother HL-1270N

Brother HL-1670N

Canon S450

Canon S600

Canon S800

Epson Stylus Color 777i

Epson Stylus Color 880i

Epson Stylus Photo 780

Epson Stylus Photo 1280

Hewlett-Packard DeskJet 842c

PAPER CAPACITY (IN PAGES)	MAXIMUM PRINT AREA (IN INCHES)	ESTIMATED INK COST PER PAGE (IN CENTS) [A]	PROS	CONS
250	8.5 × 14.0	2	Very good image quality; Ethernet standard.	Requires RAM upgrade to print larger files and is still slow at printing them; underwhelming font set.
250	8.5 × 14.0	1	Very good image quality; Ethernet, automatic duplexing, Web-based administration tools standard; LCD menu screen.	Slow at printing complex files; underwhelming font set; expensive.
250	8.5 × 35.0	3	Good image quality; inexpensive.	Slow at printing complex files; must change settings to ASCII to print Photoshop documents.
150	8.5 × 14.0	2	Fast; good overall image quality.	Requires RAM upgrade to print larger files; expensive as tested.
250	8.5 × 14.0	2	Excellent text quality; fastest in all tests; LCD menu screen; Ethernet standard.	Expensive; grainy photo images.
500	8.5 × 14.0	2	Very good gradient prints.	PostScript not standard; expensive; very light prints; no density controls.
100	8.0 × 13.7	9 (color); 3 (black)	Separate ink tanks for each color.	Unimpressive image quality overall; cuts off text on right margin.
100	8.0 × 13.7	9 (color); 3(black)	Fast; separate ink tanks for each color.	Merely average image quality for its price.
100	8.3 × 10.8	8 (color); 7 (black)	Inexpensive; very good image quality overall.	Slow; must replace all three ink colors at once; expensive black ink.
100	8.3 × 10.8	8 (color); 5 (black)	Good detail.	Poor color matching; must replace all three ink colors at once.
100	8.5 × 11.0	7 (color); 6 (black)	Inexpensive.	Slow; must replace all three ink colors at once.
100	8.5 × 10.5	6 (color); 3 (black)	Very good image quality overall; inexpensive ink.	Must replace all three ink colors at once
100	8.3 × 13.4	13 (color); 7 (black)	Inexpensive; produces near-laser-sharp text; closes up for easy storage.	Unimpressive photo quality; must replace all three ink colors at once; expensive ink.
100	8.3 × 13.4	14 (color); 5 (black)	Fast; produces near-laser-sharp text; closes up for easy storage.	Unimpressive photo quality; must replace all three ink colors at once; doesn't ship with Mac drivers; expensive ink.
150	8.4 × 10.9	11 (color); 6 (black)	Fast; separate ink tanks for each color.	Unimpressive image quality overall; doesn't ship with Mac drivers; expensive ink.
100	8.5 × 11.0	13 (color); 2 (black) [C]	Fast printing of high-resolution photos; excellent photo-quality prints; comes with separate CompactFlash reader.	Slow at printing Word documents; text gets cut off on right margin.
100	8.5 × 44.0	5 (color); 5 (black) [C]	Excellent photo-quality prints.	Slow at printing high-resolution photos.
100	13.0 × 44.0	9 (color); 5 (black) [C]	Huge maximum print area.	Slow at printing high-resolution photos; poor gray scale; expensive.
100	8.5 × 11.0	6 (color); 3 (black) [C]	Fast at printing text documents; excellent text sharpness and gray scale; built-in SmartMedia and CompactFlash ports.	Expensive; dither produces obvious dots; ColorSync profile produces slight color cast.
100	8.5 × 11.0	9 (color); 5 (black) [C]	Built-in color picture-preview screen; can get pictures directly from Zip drives; built-in SmartMedia and CompactFlash ports.	Not-so-crisp low-resolution photo prints; manual calibration of cartridges; poor gray scale.

price plus Lexmark's 32MB upgrade, required to print large files. [B] Price reflects $369 base price plus Samsung's PostScript SIMM upgrade, required to print large files. [C] Cost per page for black ink is based on a 1,500-character document. For color inks, cost is based on an ISO SCID #5 photo image.

Hewlett-Packard DeskJet 935c

Hewlett-Packard LaserJet 1200se

Hewlett-Packard Photosmart 1218

Kodak Personal Picture Maker 200

Lexmark Optra E312

Lexmark Optra M412n

Lexmark Z32

Lexmark Z42

Samsung ML-6060

Xerox DocuPrint M760

PICTURE-PERFECT PRINTS

INK-JET PRINTERS HAVE evolved dramatically over the past few years, but the most-remarkable developments by far have been in the area of photo-quality ink-jets—printers designed for reproducing photographic images. Only five years ago, purchasing a photo printer typically meant shelling out $35,000 for an Iris machine. Today, you can pay less than $500 for a photo printer that produces output which looks and feels very much like a traditional darkroom print.

Macworld Lab put five photo printers to the test: the Canon S800, the Epson Stylus Photo 780 and Stylus Photo 1280, the Hewlett-Packard Photosmart 1218, and the Kodak Personal Picture Maker 200. We compared features, measured speeds, and evaluated output for sharpness, color, and continuous tone. When we were done, it was clear that the Stylus Photo 780, although slow, produced the best photographic images at a relatively low cost. The Kodak Personal Picture Maker 200 produced the worst.

Epson Stylus Photo 780

Ink and Paper

Instead of the four inks used by traditional ink-jet printers, four of the five photo printers we tested use six inks, adding light cyan and light magenta to the mix. The two additional inks help improve highlight detail by forming subtler dots than full-strength cyan or magenta can. (Yellow ink is already so light that there's no point in introducing a light yellow ink.) The odd man out is the Photosmart 1218, which uses the conventional four inks but prints at a very high resolution of 2,400 by 1,280 dpi.

Only one of the printers, the Canon S800, features individual ink cartridges for each color. The others use one cartridge for black and another for all the color inks; when one color-ink compartment is empty, you have to replace the whole set of color inks. Canon's multiple-cartridge approach is much more efficient and may save you money if you tend to use one ink more heavily than others. But if your ink use is evenly distributed among the colors, the extra cost of the individual cartridges may cancel out any savings.

If you're expecting to produce large images, keep in mind that only the Stylus Photo 1280 offers print areas larger than 8.5 by 11 inches, outputting prints as large as 13 by 44 inches on roll-fed panoramic paper (the roll-feed mechanism is included) or up to 13 by 19 inches on SuperB-size sheets.

Direct from Digital

Several printers offer ways to simplify the process of getting images from a camera to paper without the intervention of a Mac. Both the Personal Picture Maker 200 and the Photosmart 1218 come with built-in CompactFlash and SmartMedia readers. These let you plug your digital camera's storage medium directly into the printer and start printing. Unfortunately, not all cameras that use CompactFlash and SmartMedia are supported by all printers; check for compatibility before you make a purchase.

While this feature may be handy for making quick index prints, there are few digital-camera captures that won't benefit from preprint editing. The Personal Picture Maker 200 is also capable of hosting a USB Zip drive, from which it can print images—useful because you can transfer edited images to a Zip cartridge and then load the cartridge into your printer, allowing you to print without tying up your Mac. The S800 includes a separate CompactFlash reader, but it connects to your computer, not to the printer.

Photo Finish

The most important measure of any photo printer is the quality of its printed images. We printed a photograph at each printer's maximum resolution on the specialty paper provided by the vendor, and we rated the prints' color fidelity (the accuracy of color reproduction) and continuous tone (the lack of an obvious dot pattern).

A Photo Finish

Macworld LAB TEST

Best results in bold.
▬ Shorter is better.
●●● Excellent ●● Acceptable ● Poor

	MICROSOFT WORD 2000	ADOBE PHOTOSHOP 6.0.1		HIGH-RESOLUTION PHOTO		LOW-RES. PHOTO	GRAY SCALE	TEXT
	Text Document	High Resolution	Low Resolution	Color Fidelity	Continuous Tone	Image Quality	Neutrality	Sharpness
Canon S800	12:10	**5:05**	1:12	●●	●●●	●●●	●●	●
Epson Stylus Photo 780	5:27	25:27	0:42	●●●	●●●	●●	●●	●●
Epson Stylus Photo 1280	5:41	24:56	**0:41**	●●	●●●	●●	●	●●
Hewlett-Packard Photosmart 1218	**2:35**	7:25	1:52	●●	●●	●●●	●●●	●●●
Kodak Personal Picture Maker 200	5:11	24:41	6:31	●●●	●●	●	●	●●
	◀ Better	◀ Better	◀ Better					

Speed-test results are in minutes:seconds. We printed a ten-page Word document, both a 22MB high-resolution and a 100K low-resolution Photoshop image, and a 748K PDF file using Adobe Acrobat 4. We measured times from the moment the print button was clicked on to the moment the last page fully emerged from the printer. We set Photoshop's memory partition to 75MB. Our test system was a Power Macintosh G4/500 with 128MB of RAM, Mac OS 9.1 installed, and virtual memory enabled. Macworld Lab conducted subjective tests in which a jury of experts rated each printer's output quality as excellent, acceptable, or poor.—**Macworld Lab testing by Ulyssis Bravo**

When reading our scores, keep in mind that color fidelity is largely related to the accuracy of the printer's included ColorSync profiles. We used a Photoshop Lab file as our test image to ensure that each printer's vendor-supplied ColorSync profile was the only profile that affected the color. If you plan to generate custom profiles for your own system, you may be able to improve the printer's color fidelity. (For tips on constructing custom profiles, see "Show Your True Colors," *How-to*, April 2001.)

All the printers we looked at received at least acceptable ratings for color fidelity and continuous tone. But the Stylus Photo 780 was the clear winner, rated excellent by our jury in both categories. Its larger sibling the Stylus Photo 1280 produced excellent continuous tone, but it scored slightly lower in the color-fidelity test because the image appeared slightly undersaturated. The S800 and the Photosmart 1218 each had some problems with color fidelity, showing slight color casts, but the S800 had better continuous tone. The Personal Picture Maker 200 had excellent color fidelity, but it displayed the worst continuous tone and was noticeably less sharp than any of the other printers.

We also looked at how well the printers produced neutral gray-scale images using all the colors. (This extends dynamic range by producing a darker black than black ink alone can achieve, and it gives a better continuous tone.) The only printer that produced a good neutral black-and-white image was the Photosmart 1218. The S800 and the Stylus Photo 780 printed slightly off-neutral images, while images from the Stylus Photo 1280 and the Personal Picture Maker 200 had an obvious and objectionable color cast.

Although all these printers are optimized for photographic output on specialty paper, we looked at their performance with both text files and low-resolution photographs on lower-priced plain paper. (The specialty papers are too expensive to use for text or draft prints.) The Photosmart 1218 was the only printer that produced excellent results in these tests. The S800 did a good job of printing photographic images on plain paper, but its text output was noticeably less sharp than any of the other printers. Both Stylus Photo models produced acceptable (but slightly fuzzy) results. The Personal Picture Maker 200 printed text acceptably, but it had by far the worst photographic output on plain paper, with garishly oversaturated colors and blocked-up shadows.

Slow Progress

Sluggish speed is one of the trade-offs you make for printing in color. The Photosmart 1218 was fastest on our text document and came in just behind the S800 on the high-resolution Photoshop image—taking nearly seven and a half minutes, compared with the S800's five. Both Stylus Photo models and the Personal Picture Maker 200 took close to 25 minutes to print the same photograph. However, the S800 was much slower than the other models when printing text. You can increase your printer's speed by lowering the resolution setting, but remember that this will also lower image quality. The notable exceptions to this were the Stylus Photo printers; we could see very little difference between their output at 2,880 by 720 dpi and at 1,440 by 720 dpi.—BRUCE FRASER

EDITORS' CHOICE

●●●●½ **Epson Stylus Photo 780** For photographic output, this was the clear winner among the five photo printers we tested. Although slow, it produced the best high-resolution prints. It is also the least expensive model in its category.
Company: Epson (800/873-7766, www.epson.com)
Company's estimated price: $149

"A printer's actual resolution—the degree to which it can resolve fine detail—is always less than the stated resolution, sometimes much less."

tions, with resolution enhancement on the lower resolutions. Most resolution-enhancement technologies modulate the laser to produce dots of different sizes (although never smaller than allowed by the printer's maximum resolution). This variation often produces even better gray-scale halftones and smoother edges on characters than the printer's highest resolution can. In other words, a 600-dpi laser printer with resolution enhancement may produce better-looking output than a 1,200-dpi laser without it.

PostScript Most laser printers include either an Adobe-licensed PostScript interpreter or a PostScript-compatible interpreter from a third party (called a PostScript clone). The vast majority of today's PostScript-clone RIPs seem to do every bit as good a job as those sanctioned by Adobe. If you need to print only pages of text, you probably don't need PostScript, but if you want to print documents from PostScript-based applications, a PostScript RIP is essential.

Choosing Your Ink-Jet Printer

Many of the criteria you'd use to judge a laser printer—such as print quality and speed—also will apply to ink-jet printers. (To learn how all-purpose and photo-quality ink-jet printers fared in our tests, see "Colorful Competition" and "A Photo Finish.")

Image Quality If it's difficult to make meaningful judgments based on a laser printer's resolution specs, it's just about impossible with an ink-jet printer's. This is because inks soak into paper—bleeding and blending into one another—to varying degrees, depending on the paper's composition. Ink-jet resolution specs are like clothing sizes: you can use them to compare different items from the same vendor, but when you start comparing different brands, you have to go beyond the manufacturer's information. The only reliable way for you to judge ink-jet image quality is by looking at print samples, preferably printed on the same paper you intend to use regularly.

When you test a printer, make sure the paper settings in the printer driver match the type of paper you're using. These settings control the amount of ink the printer lays down and the dither pattern it uses to do so. Too much ink will produce oversaturated and dark prints, while too little will produce washed-out results. Check for obvious ink dots and smoothness of tone. You should also examine the image's color for natural-looking skin tones and the presence of highlights and shadows.

Paper and Ink The results you get from an ink-jet depend heavily on the combination of ink and paper stock. An ink may produce gorgeous results on one paper and hideous ones on another, so take a look at the types of paper supported by any printer you're considering; make sure they're up to your standards. If you plan to use third-party inks or papers in your printer, you may want to join one of the many mailing lists devoted to the various ink-jets (try www.leben.com/lists/epson-inkjet/info.html, for example). You'll learn from others' experiences which ink-and-paper combinations get good results.

Remember that your printer's consumables will play a big role in your bottom line. With some ink-jets, you can replace a single ink when it runs out; with others you're forced to replace all the ink colors—even if some are still full. Check to see whether the ink-jet model you're considering is widely supported by third-party ink vendors (try doing a Google search on ink-jet inks). If it isn't, you may have to use the more expensive inks sold by the printer vendor.

Noise Finally, be sure to weigh the annoyance factor. Ink-jet printers vary widely in the amount of noise they make: some are almost silent, while others shake, rattle, and roll. Try to hear the printer in action before you buy it.

The Last Word

Printing from the Mac has never been easier or more affordable, so take time to analyze your needs. Consider the operating costs, as well as the purchase cost, of any printer. Give due weight to features you absolutely must have and to those you'd like but can live without. If you follow these guidelines, you'll end up with the printer that's best for you. **m**

BRUCE FRASER is a coauthor of *Real World Photoshop 6* (Peachpit Press, 2001), which he proofed on a ten-year-old Apple LaserWriter Pro 630 and an Epson Stylus Photo 1270.

I'd heard a lot of buzz about ATI's new RADEON™ MAC EDITION, its stunning 3D acceleration, 32MB DDR graphics memory and flexible display support. I wondered, would this graphics accelerator really make designing easier and faster? Wow! It didn't take long to find out. RADEON™ MAC EDITION rendered the most complex 3D elements faster than I'd ever seen; even when working in 32-bit true color! My projects literally sprang to life with incredible detail and realism. But RADEON™ MAC EDITION isn't all work and no play. The 3D gaming – on my lunch break of course, is just as incredible with noticeably faster frame rates. With the fastest rendering speeds available, animations are fluid and life-like. Plus, I can hook up a TV for a big-screen experience. 3D rendering performance, awesome gaming, and display flexibility make RADEON™ MAC EDITION one wicked card!

ATi RADEON GRAPHICS™

RADEON™ MAC EDITION is "...our top pick in 3-D graphics cards." -MacWorld.com, January 24, 2001

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OTHER ARTICLES IN THIS SECTION

70 Think Outside the Picture Box
Break through boundaries with QuarkXPress clipping paths.

77 Web Publishing Secrets
Find and replace in Dreamweaver.

81 Print Publishing Secrets
Plan ahead for perfect printing.

85 Mac OS X Secrets
Build and run a site with Apache Web Server.

88 Mac 911
This month we've got 50 percent more tips and tricks!

OLD MAC NEW TRICKS

PUT THAT MAC BACK TO WORK AS AN MP3 JUKEBOX

BY ADAM C. ENGST

Forget Napster. The real significance of MP3 is that it's a highly efficient format for storing audio—not that it's inherently related to the Internet. In fact, the most exciting aspect of MP3 is that it offers new ways to enjoy the music you already have, without long downloads or ethically ambiguous copying. You can convert music from the audio CDs you already own, play it from your Mac, shuffle through your entire music collection quickly, and create custom playlists that span many different albums, deleting those songs you've never liked. And the best part? None of this requires a fancy new machine—just a PowerPC-based Mac with a lot of hard drive space.

In previous installments of our "Old Mac, New Tricks" series (*How-to*, June and July 2001), we helped you get your old Mac up and running and showed you how to turn it into a Web server. Now we'll show you how you can use that elderly Macintosh as an MP3 jukebox that will supercharge your stereo system.

ILLUSTRATION BY DAN WINTERS AND GARY TANHAUSER

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STEP 1 Choose Your MP3-Jukebox Hardware

The first thing you'll need to do is make sure your old Mac has sufficient CPU power to handle playing MP3s. You'll also probably need some additional hardware, since the original hard drives in old Macs are seldom large enough to store your entire music collection as MP3 files.

Recommended Models If you're eager to put that old Quadra 650 to work—sorry, but you need a PowerPC-based Mac. No MP3 software works on 680X0-based Macs. You can use a Power Mac 6100 to play MP3s, but you'll probably have to encode your CDs on a newer Mac and transfer them to the 6100. For this project, I recommend a Mac with a PowerPC 603 chip or later, such as the Performa 6400 or Power Mac 8500. (Check the Apple Spec database at http://support.info.apple.com/info.apple.com/applespec/applespec.taf.)

These models have enough power to play MP3s without skipping while simultaneously handling a few other tasks. A PowerPC-based PowerBook (any four-digit model number, such as the PowerBook 3400) is an even better choice, since it will require less space in your home, not to mention less electricity. And perhaps the ideal MP3 jukebox—if you happen to have one lying around—is Apple's stylish limited-edition Twentieth Anniversary Mac (which features a PowerPC 603e CPU, an easy-to-replace IDE hard disk, and a Bose Acoustimass sound system).

RAM Having a lot of RAM isn't particularly important for a Mac acting as an MP3 jukebox. MP3 players generally require 5MB to 8MB of available RAM, so Macs with at least 32MB of RAM should work fine (at least with Mac OS 8.6 or earlier—Mac OS 9 would be better served by 64MB of RAM).

ONE ALBUM CAN EAT UP 30MB TO 80MB OF HARD DRIVE SPACE

Hard Drive Hard drive space is a different issue. Old PowerPC-based Macs came with 500MB to 2GB of hard drive space. Since a single album converted to MP3 format can eat up 30MB to 80MB (depending on the length of the album and your encoding settings), the bad news is that you'll almost certainly need a larger hard drive.

The good news is that huge hard drives are insanely cheap these days. For about $250, you can get an 80GB IDE internal hard drive, a 36GB SCSI internal hard drive, or an external 40GB FireWire hard drive. Visit dealmac (www.dealmac.com) or Price Watch (www.pricewatch.com) to find low prices. So which type should you get?

If your old Mac supports internal IDE drives, your first choice should be IDE. Even if your Mac has an internal SCSI hard drive, as long as it has a PCI slot, you can buy an inexpensive IDE card such as the $100 Sonnet Technologies Tempo Ultra ATA66 (♦♦♦♦; www.macworld.com/2000/09/18/reviews/ata.html), which lets you add an internal IDE drive instead of a more expensive internal SCSI drive. An internal IDE hard drive is by far the cheapest option, making it ideal for this project, since you probably don't want to invest too much in an old Mac. An internal drive also cuts down on noise, and you won't have to fuss with turning external drives on and off. The PowerPC-based PowerBooks, almost all PowerPC Performas, and a few Power Macs support internal IDE. PowerBooks use 2.5-inch hard drives, which are smaller and more expensive than standard drives.

If your old Mac has an internal SCSI hard drive and you want to stick with SCSI, you can buy a large internal or an external SCSI hard drive (the only option for NuBus-based Power Macs), or you can opt for a FireWire PCI card and an external FireWire hard drive. An internal SCSI drive will be less expensive than either an external SCSI drive or the combination of a FireWire PCI card and external drive. However, with the FireWire approach, you can get a card that also supports USB, such as the $140 Sonnet Tango FireWire/USB PCI card (949/587-3500; www.sonnettech.com). With USB capabilities, you can control your MP3 software via a Keyspan Digital Media Remote, a tiny remote control (see "MP3 Jukebox Gadgets").

Installation of an internal hard drive is more complex than plugging in an external SCSI or FireWire cable, especially with some PowerBooks, but if you've installed hardware in a Mac before, it's not too difficult. You can find assistance at AccelerateYourMac (www.xlr8yourmac.com), and this might also be a good time to solicit some help from a friend with more installation experience. After you've installed the hard drive and put your Mac back together, start up from a Mac OS CD-ROM and use the Drive

All Together Now The single-window interface of iTunes works well for a dedicated MP3 jukebox, since you don't have to open, arrange, and close numerous windows to access controls and playlists.

Setup utility to initialize the hard drive. Then, if you've replaced your old internal hard drive or want to use the new drive as your startup drive, install a fresh copy of Mac OS—preferably a copy of Mac OS 8.6 or, if you want to use Apple's iTunes, 9.0.4 or 9.1.

STEP 2 Pick Your MP3 Software

MP3's popularity has resulted in oodles of programs that can play MP3 audio files and a smaller number that can encode audio from a CD into MP3 format. I prefer those that can both play and encode, because you can do everything in a single program. In particular, I recommend Apple's iTunes and Panic's Audion. Casady & Greene's SoundJam MP is also good, but the company stopped selling the program in June.

iTunes After using SoundJam for some time, I've come to prefer the interface of Apple's free iTunes 1.1 (★★★★; *Reviews*, June 2001). Written by the programmers responsible for SoundJam, iTunes shares most of its important features, including flexible playlists, a variety of encoding options, and broad support for portable MP3 players. And iTunes goes beyond SoundJam with its ability to burn custom audio CDs without requiring another program, such as Toast. And its single-window interface works better on a Mac dedicated to playing MP3s than the multiple-window interfaces many other MP3 players use (see "All Together Now").

Audion Panic's $33 Audion 2.1 (★★★★; www.macworld.com/2001/02/23/reviews/mexpress.html) offers all the basic features, such as playlists, skins, and visual plug-ins, and adds a host of less common ones, including a waveform-based MP3 editor (useful for trimming applause from live songs), an equalizer that can operate on everything or on specific songs, a two-track mixer, speed control, and additional encoding capabilities. Audion pays special attention to how people interact with their music collections via features such as a per-song play counter, support for album-cover art, personal popularity ratings, and playlists that update to reflect the organization of your MP3 files in the Finder.

Bottom Line Both of these programs work well, but if you're running Mac OS 9.0.4 or later, you can't beat Apple's free iTunes. If you have an older version of Mac OS, choose Audion, though on an underpowered Mac such as the Power Mac 6100, you might find it sluggish. In that case, I'd recommend using iTunes to encode MP3s from your CD collection on the newer Mac, copying the MP3 files to the older Mac, and using a simple, efficient MP3 player such as the free GrayAMP from Digital Thoughts (www.digithought.net).

MP3 Jukebox Gadgets

You can enhance your MP3 jukebox with a transmitter, for sending MP3 audio to your stereo, and a remote control, for controlling MP3 software from a distance.

Transmitters and Receivers What do you do if your MP3-playing Mac is across the room from your stereo's amplifier and speakers? Akoo's $100 Kima KS-110 and RF-Link's $120 Cam Pro (★★★½ and ★★½, respectively; www.macworld.com/2001/05/23/reviews/wirelesstrans.html) use a transmitter attached to your Mac to broadcast audio to a stereo-connected receiver. Both devices work roughly like cordless phones—the Kima transmits in the commonly used 900MHz band, while the Cam Pro operates in the 2.4GHz band, like newer cordless phones. The Kima comes with all the cables you need and features a pass-through jack for plugging additional speakers into the transmitting Mac so you can both transmit audio to your stereo and listen to it on speakers connected to your Mac. The Cam Pro is designed to transmit audio and video, so it includes video cables; you'll need to buy another cable to connect your Mac's headphone jack to the Cam Pro's RCA jacks.

Remote Control If the perfect spot for your MP3 jukebox Mac is someplace relatively inaccessible, you can control your MP3 software via Keyspan's $49 Digital Media Remote (★★★½; www.macworld.com/2000/03/reviews/digimediaremote.html). This credit card-size remote sends infrared commands to a receiver connected to the Mac's USB port (you'll need to add a PCI or PC Card USB adapter to your old Mac). The device requires a line of sight to its receiver, and its software can control any Mac application by simulating keyboard shortcuts.

STEP 3 Set Up Your Speakers

With MP3 audio, sound can come from one of three sources: your Mac's built-in speakers, standard multimedia speakers, or the speakers connected to your stereo system.

Built-in Speaker The Twentieth Anniversary Mac is possibly an exception, but overall I can't recommend using your Mac's built-in speaker for listening to MP3s. The quality of internal speakers generally stinks. You can't get separation of the right and left channels for stereo sound, and the volume most certainly does not go to eleven, so you're not likely to be able to hear your music from across the room or crank the volume for your favorites.

continues

Multimedia Speakers The easiest approach is to connect a pair of powered multimedia speakers to your Mac's headphone jack or USB port. The quality of these speakers ranges from poor to quite good, though they seldom can compete with speakers attached to a stereo system's amplifier. They do require an extra electrical socket, and unsightly wires running to the Mac and between the speakers.

Stereo Speakers You'll hear the best quality if you play your MP3s through a stereo system's amplifier and speakers. This approach requires a Y-cable connected from your Mac's headphone jack to an unused pair of red and white RCA input jacks on your stereo; you can find these inexpensive cables at an electronics store such as Radio Shack. The main downside of this approach is that you may not find it convenient to locate your Mac physically close to the stereo (see "MP3 Jukebox Gadgets" for some solutions).

MP3 Jukebox Tips

- **MP3 Server** If you store your MP3 files on a networked Mac running Mac OS 9's File Sharing over TCP/IP, you can play them from any Mac on your network, even machines using an AirPort wireless network.
- **Backup Bonus** When you're making a backup of your Mac (you are backing up, aren't you?), it's best to exclude MP3 files. They take up vast amounts of space, they don't compress, and you can always encode them again should calamity strike. Another approach would be to burn them to CD-R for a backup that you can also play in portable MP3-CD players.
- **Universal Pause Button** In iTunes or Audion, to pause playback quickly if the phone rings, just press the space bar (other MP3 players may use a different keyboard shortcut). Press it again to resume play. If you're running other applications on your MP3 jukebox, use a macro program to create a hot key that switches to the MP3 program and presses the space bar for you.

How-to

STEP 4 Rip Your Audio CDs

With your Mac and speakers set up and the MP3 software installed, you're ready to turn your audio CD collection into MP3 files. Be forewarned that encoding will take time on older Macs, perhaps up to twice as long as it would take to play the CD. I found it convenient to put a pile of CDs next to my MP3 Mac and encode them whenever I thought of it. If you're in a hurry, consider encoding on a faster Mac and copying the files to your MP3 Mac later. Also, you can save laborious typing of track names if you encode your CDs on a Mac with an Internet connection, since both iTunes and Audion can download the names of audio CD tracks from the Internet-based CDDB database.

When it's time to choose encoding settings, it's best to start with the default settings, which means 128 Kbps (kilobits per second) in Audion and 160 Kbps in iTunes. If your ears are sensitive enough to hear quality loss after you've encoded at the default settings, try again at a higher bit rate, such as 160 Kbps or 192 Kbps. One significant drawback is that files encoded at higher bit rates take up more hard drive space. (See "MP3 to Go," February 2000, for more information.)

IT'S BETTER TO **START WITH** THE DEFAULT **ENCODING** SETTINGS

STEP 5 Create Playlists and Play

When you start using your MP3 jukebox, you might just play a single album at a time. But you can do so much more with MP3 files.

All MP3 players can shuffle songs randomly, just like traditional multidisc CD players. The difference is that with your MP3 jukebox, you are able to shuffle hundreds or even thousands of songs, as opposed to just those from the few CDs that fit in your CD player. It's your very own radio station.

You can also create playlists—collections of songs just like those compilation tapes you made back in college, only they're not limited to a 90-minute cassette. You might start with a playlist of your all-time favorites, of all your jazz recordings, or of just Beatles songs. Once you've gotten the hang of it, how about a playlist of dance music, or music you like to listen to while making dinner, or quiet evening music? Only your imagination limits the ways you can mix and match your music.

The Last Word

You may not be able to stock your new jukebox with free music from Napster anymore, but that's not so important. Building an MP3 jukebox lets you appreciate the music you already own—in ways that only recently became possible. And even better, if you're like me, you'll get a warm fuzzy feeling from using your old Mac to infuse your stereo system with intelligence. **m**

Contributing Editor ADAM C. ENGST is the publisher of TidBits (www.tidbits.com), the author of numerous books and articles about Macs and the Internet, and the president of the Info-Mac Network.

More Info: www.macworld.com/subject/oldmac/

Read more of our "Old Mac, New Tricks" series, and then visit the Macworld.com forums to tell us what you've done with your aging machine.

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DAVID BLATNER

Think Outside the Picture Box

QuarkXPress Clipping Paths Set Your Images Free

You've surely heard the management consultant's rallying cry "Think outside the box!" It refers to breaking away from habitual thinking to achieve a goal, and the credo is as useful for graphic artists in T-shirts as it is for CFOs in yellow ties.

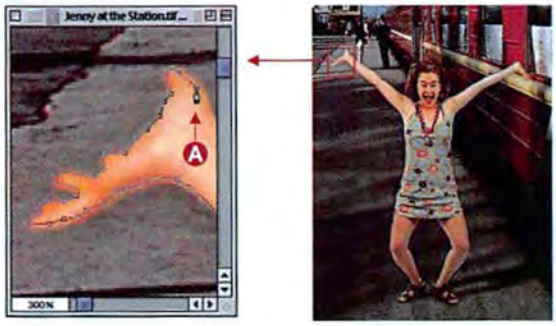
Putting an image inside a framed box is fine for some designs, but when you're trying to make a strong visual statement that really catches the viewer's eye, try letting your pictures break outside their boxes, if only a little bit. Say you're working with a photo of a gleeful woman with outspread arms. You can put it inside a framed picture box, but the box's rigidity may work against the action in the photo. Make your subject's arms break past the frame border, and you add life and motion to your layout.

It's easy to cross boundaries once you understand how QuarkXPress 4.1 and Adobe Photoshop 6 handle cropping and clipping. QuarkXPress picture boxes *crop* images into the shape of the box—usually a rectangle. Photoshop lets you *clip* an image into any shape by embedding Bézier paths into the image. QuarkXPress can read those paths and merge them with cropping rectangles to create custom paths that free your pictures to go beyond their boxes. **m**

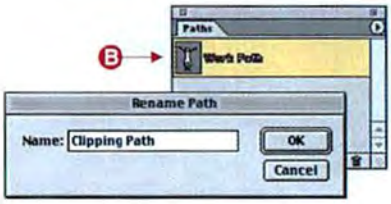
DAVID BLATNER is the author of *The QuarkXPress 4 Book* (Peachpit Press, 1998) and a coauthor of *Real World Photoshop 6* (Peachpit Press, 2001). Find him at www.peachpit.com/blatner/.

1

Create a Clipping Path You can use QuarkXPress to build a clipping path around an image with a white background, but you'll almost certainly get a better result if you make a path with Photoshop's Bézier tool and save the path in Photoshop's Paths palette.



Open the image in Photoshop. You'll get the cleanest results by drawing the path with the Pen tool (press P to toggle to it) **A** and adjusting it with the Path Component Selection tool (press A), commonly called the "Arrow tool." Draw the path slightly inside the foreground object's edge so you don't pick up background color, which causes halos.



When you're done with the path, double-click on the Work Path tile in the Paths palette **B**, and then give it a name in the Rename Path dialog box that appears.

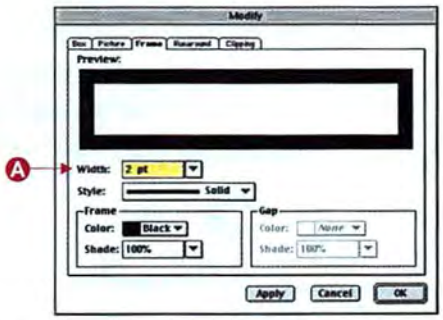
Because QuarkXPress lets you choose any embedded path as a clipping path, you don't need to specify the path type in Photoshop. Once you're satisfied with your clipping path, save it as a TIFF file.

TIP: QuarkXPress 4.X can't read clipping paths saved in TIFF files from Photoshop 6.0. Fortunately, Adobe's free 6.0.1 upgrade can fix the problem (www.adobe.com/support/downloads).

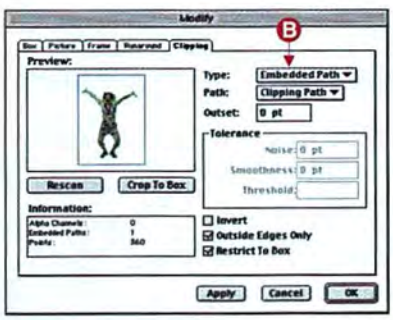
2

Import the Image and Select a Clipping Path Your picture has to have a border to burst out of. In this step, you'll choose a frame and then select the correct path.

Open your QuarkXPress layout and import your image into a picture box. If the picture box doesn't already have a border, go to the Modify dialog box (Item: Frame) and add one. The frame can be almost any thickness, but for a noticeable effect, make it at least 2 or 3 points thick A.



Now open the Clipping dialog box (Item: Clipping), choose Embedded Path from the Type pop-up menu B, and pick a path from the Path pop-up menu. QuarkXPress 4.1 can see all the paths you've embedded in your TIFF images, and it lets you choose an active clipping path. (If you use EPS or DCS images, QuarkXPress will still see other embedded paths, but they may not print correctly if you choose one other than the "official" clipping path you specified in Photoshop.) Of course, if there's only one path in the image, only it will appear in this menu.



Leave the other settings in this dialog box as they are, and click on OK.

3

Crop the Image Images can often benefit from judicious cropping. In this step, you'll ignore clipping (for the moment) and crop your image.

Change the size of the picture box by dragging its corner A or edge handles B until the part of the image you want cropped out is invisible. The box should be exactly the size you want it to be in the final layout. (You can change the shape of the box later on.)

At this point, you're focusing only on cropping, so you can ignore the fact that the portion of the image you want to break outside the box is currently cropped out.

TIP: Behind the scenes, clipping paths and cropping are actually the same thing. The image file itself stores clipping paths, and the page-layout program handles cropping—but when it comes time to print, the PostScript device can't tell one from the other.

continues

More Info: www.macworld.com/cgi-bin/ubb/Ultimate.cgi/

If you have a QuarkXPress quandary or question, head to Macworld.com's Design and Publishing forum.

LINK

surf's up way up!

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4

Extend the Picture Box Now it's time to focus on the portion of the image that breaks past the box boundary. This is the weird part: to create this effect, you first need to extend the picture box so that the parts you want ultimately to appear *outside* the box are *inside* it.

If you want the box to be a shape other than rectangular, you must convert it to the Bézier format (select the Bézier Box option from the Shape submenu, under the Item menu); then add points to the box's edge by option-clicking where you want them. To add an arch to the box, for example, click on a point and go to Item: Point/Segment Type: Symmetrical Point. You can then create an arch by dragging points Ⓐ.

After adding points and making the arch, you can drag the points around until your box is the right size and encompasses the parts of the foreground image you want visible Ⓑ.

This point-adding technique is worthwhile because you don't have to move any of the box's *original* corners or edge handles. Preserving the corners and edge handles makes it easier to get the look you want.

5

Crop to Box Just as you can turn off clipping (by selecting Item from the Clipping dialog box's Type pop-up menu), you can also turn off cropping. In this step, you're merging the embedded clipping path and the cropping box into a new clipping path.

Now that you've cropped your image, retaining the portions you want to break through the frame, return to the Clipping dialog box (Item: Clipping, or ⌘-option-T). Deselect the Restrict To Box option Ⓐ and click on the Apply button.

With Restrict To Box turned off, QuarkXPress clips but doesn't crop, and your picture can spill past the box's borders. At this stage, the parts you eventually want cropped out should appear outside of the box (*not* cropped) Ⓑ and the parts you want to appear outside of the box should be within the modified frame Ⓒ.

Now you can merge the clipping path and the cropping shape by clicking on the Crop To Box button in the Clipping dialog box.

Click on OK, and you've got a cropped—but not clipped—image Ⓓ. Your image will appear unchanged; in the next step, the difference will become clear.

continues

6

Set the Crop Again The last step in this technique restores the box to its original shape. When you're done, you'll have an image cropped only where you want it cropped; the rest will be outside the box.

To return the box to its former shape, remove the extra points by option-clicking on them Ⓐ.

Ⓐ

When you're done removing the points, you can leave the box as it is or go to the Shape submenu and change the box back to the rectangle or oval or whatever shape it was to begin with. The result is a boxed image with a cropped section and a section that extends past the box's border Ⓑ.

Ⓑ

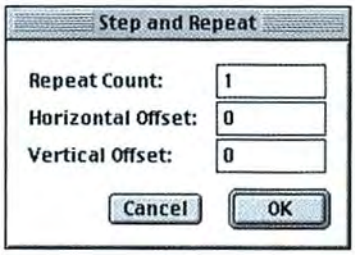
If you didn't add points to the box (as in step 4) but rather dragged out a corner or edge handle to enclose part of the image, you can ignore the previous paragraph and instead drag the box's handles to make it smaller again. As you drag, you'll find that the parts you want to extend over the box's border are doing so. Warning: Don't drag the corners or edges that affect the cropped sections (the part of the image you want cropped), or you'll ruin the effect.

7

Clipping Portions of an Image You may want to include your image's background. You can't achieve this with a single picture box, but you can fake it easily enough.

Now you have part of your image appearing outside of the picture box. If you want to restore your image's original background, go to the Item menu and choose Step And Repeat. Make one duplicate of the picture box, with offsets set to zero Ⓐ. (This clones the picture box and keeps the two boxes in perfect registration.)

Ⓐ



With the duplicate box selected, go to the Clipping tab of the Modify dialog box (press ⌘-option-T), and select Item from the Type pop-up menu to turn off the clipping path entirely. Click on OK.

To put the cloned box behind the original, where it belongs, choose Send To Back from the Item menu. Now you should see the image background *and* part of the image breaking out from the box.

As a final touch, group these two boxes (⌘-G) so you won't accidentally move one without the other later on.

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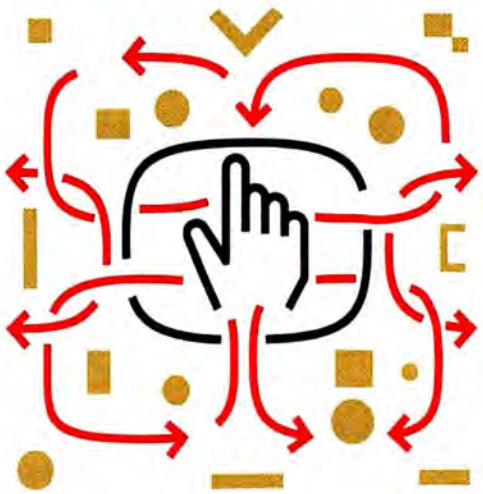
DAVID SAWYER MCFARLAND

Web Publishing Secrets

Maintaining a Web site involves daily chores, such as building new pages and removing old material. But comprehensive changes—say, swapping in a new company name on 10,000 pages—can mean many late nights of tedious work. In the first installment of our new column for Web designers, you'll learn how Macromedia Dreamweaver's Find And Replace feature can get you home on time.

Changing a Site



Imagine changing hundreds or even thousands of Web pages in seconds. You can do it with Dreamweaver's Find And Replace command, which works much like the Find And Replace feature in programs such as Microsoft Word. Though in a word processor this feature affects only the current document, in Dreamweaver (800/457-1774, www.macromedia.com) you can use it to search multiple files. Just go to the Edit menu, open the Find And Replace window (or press ⌘-F), and then select Entire Local Site from the Find In list. Be careful—changes to unopened files are permanent. It's a good idea to back up your site files before making widespread adjustments.

Get Specific The ability to search an entire site and replace a word or phrase is very useful, but it's only the beginning of what Dreamweaver's Find And Replace feature can do. The command's most powerful option is the ability to find a particular HTML tag and perform actions on the tag, its attributes, or its contents. For example, you can use one of these Specific Tag searches to convert underlined text to bold by changing all **u** tags to **b** tags, or to remove every instance of a particular tag—think **blink**.

Out with the Old

The World Wide Web Consortium (www.w3c.org), which determines HTML standards, may soon phase out some common HTML tags, such as the **font** tags used for formatting text. Although browser companies often deviate from standards, browsers may someday stop supporting these tags, so you should have a plan for changing your site to keep up with the times. (For a list of these deprecated HTML tags and their suggested replacements, see www.codehelp.co.uk/html/deprecated.html.)

The most straightforward solution is to eliminate the tag altogether: open Dreamweaver's Find And Replace window and choose Specific Tag from the Search For menu. Select Font from the Tag menu, and then choose Strip Tag from the Action menu. Click on the minus (–) button to eliminate the unnecessary tag-modifier menu that appears below the Search For menu; then click on the Replace All button to finish the job.

Simply deleting every **font** tag will leave your site a dull wash of default text. Fortunately, you can use Dreamweaver's tag-based Find And Replace options to bring your site's formatting into the future with Cascading Style Sheets.

In with the New

The World Wide Web Consortium intends Cascading Style Sheets (CSS) to eventually replace **font** tag formatting. In addition to supporting the **font** options—color, size, and typeface—CSS lets you add leading, margins, borders, and other advanced typographic properties. (For tutorials and an introduction to these style sheets, visit Webmonkey at http://hotwired.lycos.com/webmonkey/authoring/stylesheets/.)

continues

JOHN HERSEY

Easy Replacements If you've used HTML tags to structure your pages logically—for example, applying heading tags (h1 to h6) to headlines—you're in good shape. Just create a style with the desired properties for the heading tag, choose font from the tag menu, click on the plus sign (+), select Inside Tag from the drop-down tag-modifier menu, and choose the appropriate tag.

Messy Replacements Things get trickier if you've used several permutations of the font tag to format your text. Say a page contains four paragraphs identified by the p (paragraph) tag. Three of the paragraphs contain the body text and are formatted in dark blue using the font tag. But the fourth paragraph contains a news announcement that's red, in a different font and size. Ideally, you'd create separate styles for body text and news announcements and apply them to the appropriate paragraphs. For example, to apply a style called "announcement" to a paragraph, add the class attribute to the p tag, like this: <p class="announcement">.

The difficulty comes in identifying and applying a class to *just* the paragraphs containing news announcements. In Dreamweaver, the best way to handle this is to use the unique combination of tags and attributes formatting your text as the search pattern in a Find And Replace operation. In the previous example, if you'd originally used <p font size="5" face="Arial, Helvetica, sans-serif" color="#FF0000"> to format the announcement, that's what you'd type in to pinpoint your search. Once Dreamweaver finds the appropriate tag, you can add a style to update it and then apply it to every page on your site with just one click.

Regular Expression Overdrive

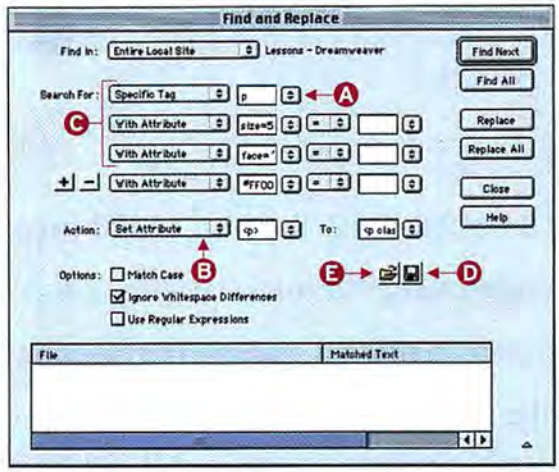
Adding textual descriptions in each image's alt attribute helps visitors who are surfing without graphics or who are visually impaired—but it's easy to overlook this important step.

Enter Find And Replace. Let's say you use a graphic named "banner.gif" on each of a site's 2,000 pages, and you need to set that image's alt attribute quickly. Open the Find And Replace window. To search every file in your site, choose Select Entire Local Site from the Find In menu; from the Search For menu, choose the Specific Tag option.

Next, select the img tag to search for images. But you don't want to find *every* image, so you should set several tag modifiers to limit your search. Choosing Without Attribute and selecting alt from the menu will bring up only images that don't have an alt attribute.

The final part of this search is a little tricky. Although you know you're looking for the "banner.gif" graphic, the src attribute—the part of the img tag that includes the file name—will vary from page to page. Depending on a page's location relative to the graphic, the src might be "banner.gif," "images/banner.gif," or even "../../../images/banner.gif." You need a way to find every src attribute that ends in "banner.gif."

Mighty Find and Replace



In Dreamweaver's Find And Replace dialog box, you can specify a tag to search for A and an action to perform on that tag B. To refine the search, add one or more conditions using the tag-modifier menu C. Click on the floppy disk icon D to save search parameters; click on the folder icon E to recall saved queries.

The solution is to use a *regular expression*—a set of special characters that let you find patterns within text (see "Transform HTML with Regular Expressions," *Create*, November 1998).

In Dreamweaver's Find And Replace window, select the Use Regular Expressions option. In our example, you're searching for a particular pattern of zero or more characters followed by the text "banner.gif." A period (.) stands for a single character such as a letter, number, or punctuation mark. An asterisk (*) means "find the preceding character zero or more times." So combining . and * means "match *any* character zero or more times." By themselves, these two characters match *everything*, but with the name of the file added to the end—.*banner.gif—the search will yield every path that leads to the file.

All that's left is to tell Dreamweaver what to do when it finds "banner.gif." Choose Set Attribute from the Action menu; select alt from the Attribute menu. In the To field, type your text. Click on the Replace All button, and Dreamweaver will take care of the rest.

Dreamweaver's Find And Replace command will eliminate hours of unfulfilling grunt work so you can spend your time on the fun, creative side of Web development. **m**

DAVID SAWYER McFARLAND is the president of Sawyer McFarland Media (www.sawmac.com) and the author of *Dreamweaver 4: The Missing Manual* (Pogue Press/O'Reilly, 2001).

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DAVID BLATNER

Print Publishing Secrets

You can create and tweak your files using any programs you like, but if your pages don't print properly at their destination, you're sunk. Whether you send files to a service bureau or a magazine's advertising department, you must prepare them correctly to avoid extra costs and headaches. In this inaugural column for print pros—veteran and new—I spell out steps to take with every file you hand off.

Talk with Your Service Bureau

As any psychologist can tell you, the key to a good relationship is communication. And this holds true when you work with a service bureau or commercial printer—before you start, ask questions.

Use the Right Format Because different service bureaus prefer different file formats, ask whether yours wants a native file (for instance, the QuarkXPress document) or an Adobe Acrobat PDF copy of the file.

I dislike sending native files; it's just too easy for someone to change them. However, photographer Jeff Schewe taught me a great safeguard: burn your files onto a CD, and send that. If there's ever a discrepancy, you can point to the "pure" file on the disc.

A PDF file is almost always a good option; the file can't be altered accidentally, and you're less likely to forget to include your fonts (or to make other mistakes discussed later in this column). However, most folks have trouble printing PDFs that contain spot colors or duotones. In these cases, stick with sending native files.

Send a Report It's crucial to include information about your documents when you hand off your files to a service bureau; without certain details, the staff may not be able to print your files or troubleshoot if something goes wrong. Most shops offer a form that asks you for a complete list of fonts and graphics used in your document. You should also make clear your job's specifications, including whether you want crop marks printed at the pages' corners, film or paper output, and so on.

QuarkXPress's built-in Collect For Output feature creates a report that includes most of the necessary information. However, many QuarkXPress 4 users don't realize that to make a legible report, they must import the data into the Output Request template. (Look for this template in the Documents folder, which is in the QuarkXPress folder on your hard drive.)

Proof Your Files

One of the biggest mistakes that you can make when you're preparing files for print is not carefully proofreading them both on screen and on paper.

Stop Simple Mistakes Look at every word, preferably at a magnified view, to make sure it's correct. This may seem obvious, but many typos and mistakes end up in print because people are too busy to proof files. The next time you're tempted to rely on a program's spelling-checker feature, think of this: *soft wear wont sea z this s wrung.* (Most spelling checkers ignore single-letter words.)

Print and Send a Proof If you get a file to print correctly, there's a good chance the service bureau can, too. Test-print your document on a PostScript laser printer. If it's a color document, print separations to make sure that images separate correctly and that your overprints and knockouts act as expected. Incorrect or ambiguous trapping commands sometimes cause QuarkXPress to make type appear fat, and you can see this only on separations. Send these proofs to the service bureau with your file.

continues

JAMES STEINBERG

To save paper, you can use Adobe Acrobat ($249; 888/724-4508, www.adobe.com) as a software PostScript printer: distill your PostScript files with Acrobat (in other words, make a PDF file), and then proof your document on screen. If Acrobat can distill your file, your service bureau will usually be able to print it. But watch out: Acrobat cannot display halftones, and many people find it easier to proof color separations on paper.

Prevent Graphic Errors

Most image problems boil down to one of three things: missing files, incorrect resolution, and problem file formats.

Send High-Resolution Graphics When you import an image into QuarkXPress or Adobe InDesign, the program typically embeds a low-resolution preview and creates a link to the external high-resolution version. So if you send your native document to a service bureau, you should also send your TIFF, EPS, and DCS graphics files. Otherwise, the result will be a low-resolution, pixelated image (or a late-night phone call from someone asking where the files are).

Use the Right Resolution Your image may turn out ugly and pixelated if its resolution is too low (that is, if you don't have enough pixel data for a high-quality print). You must save your photographic images with a resolution of about 1.5 times your halftone screen frequency (the correct resolution is usually 120 to 150 ppi for newsprint and 200 to 250 ppi for the glossy paper used in magazines). Line art (in which each pixel is either black or white) must have a much higher resolution—400 to 600 ppi for newsprint, and 800 ppi or higher for magazine paper.

Choose the Proper File Format When it comes to bitmapped data (for example, Adobe Photoshop files), use the TIFF format whenever possible—it's the easiest file format to color-manage and print. Duotones must be in the EPS format, and images with spot colors must be in the DCS format. For just about everything else, I use TIFF.

Photoshop gives you several options for compressing TIFF files (LZW compression, for example). However, compressed files occasionally cause trouble at printing time.

Sidestep PDF Pitfalls When you turn your document into a for-print PDF file, be sure to deselect image downsampling and choose ZIP as the image-compression option in the Distiller's Job Options dialog box. Otherwise, your pictures will become pixelated.

Avoid Font and Color Foibles

Nothing's worse than seeing your carefully chosen type print in an incorrect font or your lovely colors come out black. Fortunately, you have to watch for only a few mistakes.

Pass on TrueType Most imaging bureaus have trouble printing TrueType fonts, and many prefer that you use PostScript Type 1 fonts.

Send All the Fonts Collect your files and graphics into a folder, and don't forget to add your fonts—the ones you used in your documents *and* those in your EPS or DCS files. Be sure to send both the outline fonts and screen fonts.

Preflight Checklist

Fonts

- Include your document's fonts—outline *and* screen.
- Include all fonts used in EPS files.
- Use PostScript fonts instead of TrueType.

Graphics

- Check for missing or modified images.
- Include EPS, DCS, TIFF, and JPEG files.
- Make sure all graphics have the proper resolution (usually 1.5 times your halftone screen).
- Make sure color images are CMYK, not RGB.

Final Check

- Include a report with your files.
- Include the document. (Don't laugh—sometimes this is the one thing people forget after a long day!)

Choose the Right Colors By default, every scanner scans in RGB mode. When you define a color in QuarkXPress, it is based on RGB unless you tweak the settings. But in order for your color pictures and objects (type, boxes, and so on) to print correctly, you need to change them to CMYK mode—unless you're using spot Pantone colors. If you send an RGB image to an imaging center, it'll probably print only on the black plate.

Try Helpful Software

If you're willing to spend some money, several programs can help you get your files together and avoid mistakes.

If you use QuarkXPress, check out Gluon's $149 QC 4 with Collect XTension (212/343-1755, www.gluon.com). It can alert you to a number of potential problems in your document, such as images that are scaled too large. The great thing about this extension is that it gives you feedback *while* you're working on your document. When you're ready, QC Collect can also collect the fonts for you.

Preflight software can help find potential errors before you commit a file to print. Markzware's $399 Flightcheck (800/300-3532, www.markzware.com) and Extensis Software's $400 Preflight Pro (800/796-9798, www.extensis.com) both check font usage, picture resolution, color mode, and so on.

Stay Optimistic

If you follow the steps we've outlined, you'll avoid the most-common errors and boost your odds of getting reliable, high-quality prints. **m**

Contributing Editor DAVID BLATNER is the author of *The QuarkXPress 4 Book* (Peachpit Press, 1998) and a coauthor of *Real World Photoshop 6* (Peachpit Press, 2001). Find him at www.moo.com.

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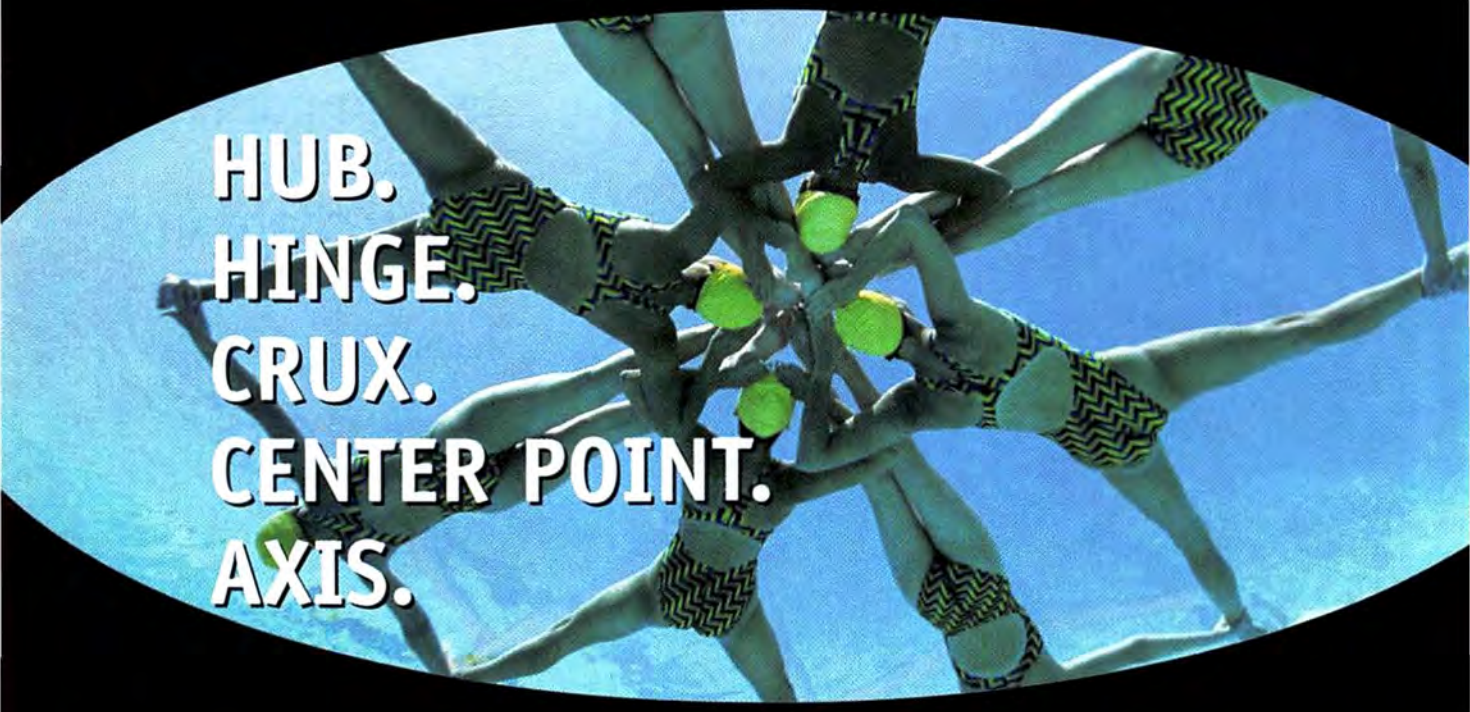

Where It All Comes Together—Seybold Seminars

Delivering content today involves considerations unheard of just a few short years ago. Digital communication technologies—the Web, Internet-enabled cell phones, PDAs, broadband, streamed media—were less than a twinkle in some visionary's eye. Now communicators have to leverage a combination of media, if not the full range, in order to achieve results. They have to plan and proceed with precision. And, as never before, they have to collaborate and rely on teamwork to create and deliver cross-media communications.

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GREG KNAUSS

Mac OS X Secrets

With the release of the Unix-based Mac OS X, Mac users gained access to the wildly popular, industrial-strength Apache Web server, part of OS X's standard installation. Apache software runs almost two-thirds of the sites on the Web, and Apache Web server may be the most powerful Web server around. With it, your Mac becomes a near-perfect platform for running your site.

Gathering the Tools

Do you have something to say? If you have a broadband Internet connection, a static IP address, and permission from your ISP to run server software, your Mac can help you broadcast it to the world—you don't even need a dedicated machine. We'll show you how to configure Apache and introduce you to its most powerful tool: Server Side Includes (SSI).

But the decision to run a Web server should not be made lightly. Depending on the volume of traffic your site receives and the size of the files you serve, Apache can use huge amounts of bandwidth and disk space. And while Apple has preconfigured Apache for maximum security, running *any* server—especially in conjunction with database or script programs—may allow the bad guys to weasel their way into your files.

Turning the Key

True to the spirit of the Mac, Apple has taken Apache, with its complex Unix origins, and turned it into extraordinarily easy-to-use software. To start the server, simply go to your Mac's System Preferences application, select Sharing, and click on the Start button under Web Sharing (see "Three-Click Setup"). This will activate the Web server and allow browsers to access Web pages within several of your Mac's directories.

The root, or starting point, of your Web site is in the /Library/WebServer/Documents directory. It's accessible on the Web at http://*12.34.56.78* (where *12.34.56.78* is the IP address in your Sharing panel, under Network Identity).

JOHN RITTER

Try it yourself. Launch your browser and go to the aforementioned URL. If you're logged in as an administrative user—a visit to the Users pane of System Preferences will tell you which users have administrative privileges—you can edit /Library/WebServer/Documents/index.html and see the changes when you reload the page in the browser.

Congratulations—you're now running Apache on your Mac!

Configuration Options: Pith Helmet Required

Apache's options can make your site far easier to customize and maintain. But to use these features, you must leave the friendly Aqua environment for the wilds of Unix.

To enable the features you want, first give yourself permission to edit the Apache configuration file and the directory it's stored in. This entails changing the security mode on these items. While logged in as an administrative user, start the Terminal application and type the following command at the prompt: **sudo chmod g+w /etc/httpd/httpd.conf /etc/httpd**. Then enter your system password.

Now you can access Apache's configuration file by typing its name, /etc/httpd/httpd.conf, into the Open dialog box in TextEdit.

Be forewarned: this file looks like nothing you've seen on a Mac before. It's more than a thousand lines of text, packed with hundreds of different commands and only the briefest instructions for their use. While there's nothing to stop you from editing these options willy-nilly, it's usually

continues

a good idea to read the relevant section of the Apache documentation—available at http://httpd.apache.org/docs—before you modify anything. If you ever hopelessly mangle Apache's configuration, you can get safely back to square one by typing **cp /etc/httpd/httpd.conf.default /etc/httpd/httpd.conf** in the Terminal window to reinstall the defaults.

Three-Click Setup To start Apache Web server, go to the Sharing panel within the System Preferences application and click on the Start button for Web Sharing.

Hand Me the Brain, Igor

Apache has hundreds of configuration options, any of which you might find useful; we'll focus on a couple of the most powerful.

Let's begin with the Directory setting. It defines permissions for specific folders—determining what your site visitors are allowed to do within a particular directory. Each Directory setting begins with **<Directory /some/directory/name>**, is followed by a list of settings, and ends with **</Directory>**.

For our purposes, don't change the first entry, which includes Apache permissions for the root of your hard drive. Instead, skip down to the second Directory command. This entry loosens restrictions on your Web site's /Library/WebServer/Documents folder, so you can serve files when they're requested.

Although you can use several commands inside any Directory setting, the most interesting is the Options command, which is simply a line of text that controls what Apache will do with the files contained in the specified directory. If you've turned on all the options we discuss in this article, it will look like this:

Options Indexes FollowSymLinks Includes

For example, the Indexes option lets Apache generate an automated catalog of files if no index.html file exists. If you'd rather hide the files and have your site visitors see a "Forbidden" error message, remove **Indexes** from the list.

Also helpful is the FollowSymLinks option, which lets Apache read files anywhere on your hard drive if they are referenced by a *symbolic link*—the Unix term for an alias—in the /Library/WebServer/Documents folder. This allows one file to appear in two places—for example, a text document can be viewed in a Web browser or downloaded via FTP. You can update one instance of the file and both will change.

SSI, Your New Best Friend

The best option of all is *Includes*. This turns on Apache's Server Side Includes (SSI) feature so you can assemble your Web pages on-the-fly. With abilities that'd cost you plenty in a commercial package such as Macromedia Dreamweaver, SSI lets you store your site's common HTML—navigation, copyrights, JavaScript, style sheets, really anything—in a few files rather than on each page, making sitewide changes quick and easy. You can add the current date, the time the file was last modified, and a host of more-complicated functions.

To enable SSI, return to the Apache configuration file and add **Includes** to the list of Options for the /Library/WebServer/Documents directory block. Next, tell Apache what type of Web pages to scan for SSI commands. Search the configuration file for *server-parsed*, and uncomment the needed directives by removing the number sign (#) at the beginning of two lines: **AddType text/html .shtml** and **AddHandler server-parsed .shtml**. With this configuration, only files with an *.shtml* extension will be checked for SSI commands. (If you want Apache to check every file on your site, change **.shtml** to **.html**.)

To finish reconfiguring the server, save the file. Then restart Apache by going back to the Sharing pane of the System Preferences application and turning Web Sharing off and then on again. If the program fails to restart, you may have a typo in the configuration file. Run **httpd** from Terminal to display the specific error.

The SSI commands themselves are part of your HTML files. They look like HTML comments, beginning with **<!--** and ending with **-->**. Between those sets of characters, you specify what you want the Include command to do. For instance, **<!--#include virtual="/common.html" -->** replaces the text of the command with the contents of your site's /common.html file. (And formatting does matter; watch where you put your spaces.) To add the current date to a page, use **<!--#echo var="DATE_LOCAL" -->**. And **<!--#fsize virtual="/file.html" -->** will show the size of /file.html.

These are just a few of the SSI commands you can put to work on your Web pages. Between SSI and the power of Apache's almost infinite configurations, you have a class-act Web server on your hands—without paying a dime extra. **m**

GREG KNAUSS has been programming software for 20 years and Unix systems for 12 years. He could probably stand to get out more.

More Info: www.macworld.com

For more information about running the Apache Web server and using Server Side Includes, go to Macworld.com and type **OSXSecrets** in the Search box.

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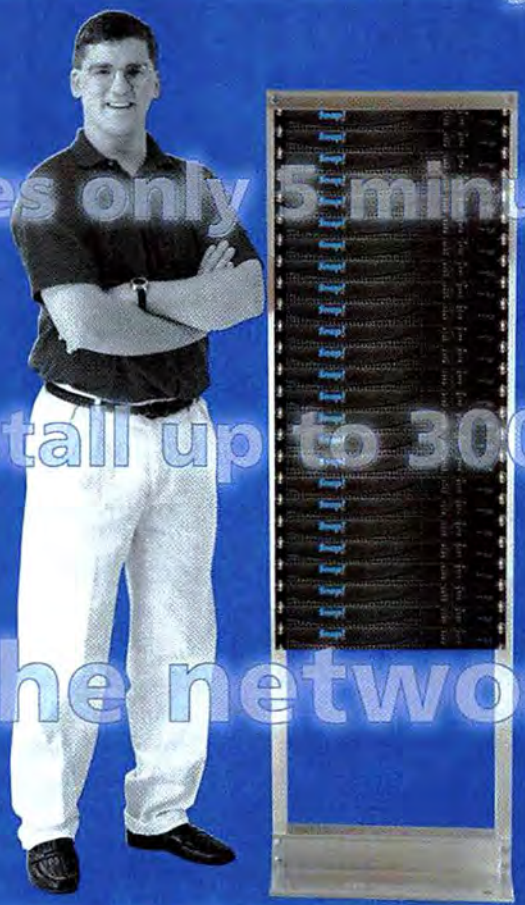

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CHRISTOPHER BREEN

Mac 911

Like the waistline of a sumo wrestler who's recently partaken of the All-U-Can-Eat special at Pete's Porkateria, *Mac 911* grows half again as large in this issue. To celebrate this expansion, we examine alternatives for bringing sound into new PowerBooks and other modern Macs, the necessity of firewalls, new ways to perform old tasks under Mac OS X, and database import and export options.

The Fury over Sound

Q. I recently purchased a PowerBook G4 and, to my dismay, saw that it had no audio-input port. I'd hoped to digitize my record collection and turn it into MP3 files. Is there any way I can do that with this PowerBook?

CINDY SCOTT
Davenport, California

FELIX SOCKWELL

A. If you follow Apple's marketing machinations, you know that Steve Jobs & Co. would like us to view the Macintosh as a "digital hub"—a go-between device for such delightful doodads as MP3 players, camcorders, digital cameras, and DVD players. Regrettably, some recent incarnations of this hub lack one very important spoke—audio input. For reasons best known to Apple, the audio-input port that has graced the Mac since the mid–Reagan era has been stripped from the latest models.

Many audio enthusiasts (and others keen on speech-recognition software) will gnash a bicuspid or two over what appears to be Apple's penny-wise, pound-foolish policy. But I prefer to view this as Apple's way of providing new opportunities for third-party developers. After all, had Apple compromised the *feng shui* of its Power Mac G4, PowerBook G4, and new iBook by including one more port, outfits that make alternative audio-input devices might have found themselves forced to scrimp on the Lil' Smokeys at the next company picnic.

This means, Cindy, that you can bring the scratchy soul of your old Wilson Pickett records into your new PowerBook with the help of a USB audio-input device such as Griffin Technology's iMic (615/399-7000; www.griffintechnology.com). This $35 thingamabob looks like a miniature yo-yo and features both an audio-input and -output port. You can use it with a microphone or with line-level devices such as your CD player or stereo receiver. And because the iMic uses Apple's native Sound Manager driver, there's no need to install additional software (though the iMic's control panel lets you adjust audio gain).

Of course, with the iMic in place, your Mac still requires some kind of software to record those ancient vinyl platters. A number of wonderful audio editors on the market will serve your needs, but I'm particularly keen on a program called Sound Studio from Felt Tip Software ($35; 215/482-6664, www.feltip.com). Sound Studio is a simple, two-track audio editor that, unlike many inexpensive competitors, is disk-based. This means you can record much larger audio files than you could with RAM-based audio editors. (Note that although Felt Tip has released a Mac OS X version of Sound Studio, at press time, it did not support recording.) If you're looking for a multitrack recording solution, take a gander at Digidesign's free version of ProTools (800/333-2137, www.digidesign.com).

And should your ramble down life's road lead you to a career in audio and multimedia, know that there are many professional audio-input devices on the market. These products—from companies such as Roland, Mark of the Unicorn, Tascam, Digidesign, and Yamaha—let you bring high-fidelity audio files into your Mac via either its

USB or FireWire port. Audio dabblers whose Macs have PCI slots will be pleased to learn that Creative Labs (www.creativelabs.com) has brought its $150 Sound Blaster Live audio and MIDI card to the Macintosh.

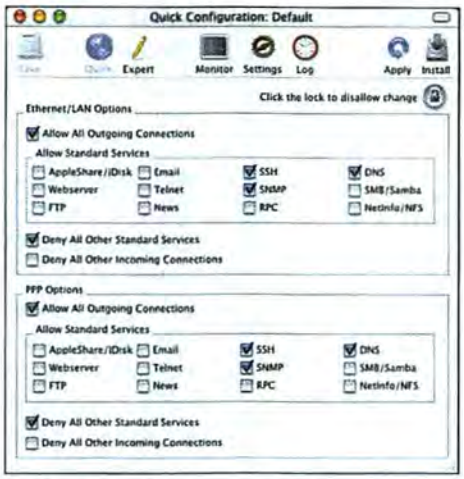
Mac OS X Startup Items

Q. How do I set up an application as a startup item under Mac OS X?

TIM WARNER
Richmond, California

A. If you've dinked around with Mac OS X, you already know that it lacks a Startup Items folder like the one found in previous versions of Mac OS. With OS X, to designate an item as one that launches at startup, you must open the System Preferences application (which is found under the Apple menu or in the Dock) and click on the Login Preferences icon. In the window that appears, you'll see a list of applications set to launch at startup. To add others, simply click on the Add button and navigate to those applications.

Because some programs can be sluggish when launching in OS X—particularly on slower Mac models—I've put this feature to good use: I added a load of applications to my launch-at-startup list. You see, I'm far more willing to grab a cup of tea while I wait for my Mac to launch all those applications at once than to count icon bounces in the Dock when I launch them one by one.



It's Mighty Mighty Brian Hill's $25 BrickHouse allows you to configure Mac OS X's built-in security features via this user-friendly interface.

Unsolicited Advice

If you live in the hinterlands (as does your humble *Mac 911* author), you know that obtaining a broadband connection can be devilishly difficult. But don't abandon hope. Thanks to satellite technology, you can now surf the Web at near-DSL speeds. The catch is, satellite surfing, offered by outfits such as StarBand (www.starband.com) can be done only with help from a Windows PC. Or can it?

Although StarBand requires that you configure the system with a PC, once it's up and running, you can network StarBand to a collection of Macs via an AirPort Base Station and Ethernet hub. Sure, you have to lightly hack your $600 investment (by removing the StarBand 180 modem's USB-to-Ethernet card), and this will likely void your warranty—but I've done the job and lived to tell the tale. You can read an account of my online exploits, called "Broadband in the Boonies," at www.macworld.com/2001/03/07/starband.html.

To give you an idea of how things are done here at *Mac 911* HQ, *my* Login Items window contains OmniWeb, Eudora, Microsoft Word, DragThing (a wonderful file-launching utility), X-Assist (which adds an application menu to the right side of OS X's menu bar), and the System Preferences application itself. I've also configured the Classic environment to load at startup by launching Classic System Preference and selecting the Start Up Classic On Login To This Computer option in the Start And Stop pane of the Classic window.

Building a Wall

Q. I recently installed a DSL connection in my home, and I've read that if you have such an always-on link to the Internet, you should have a firewall. Is this true? If so, should I use a hardware firewall, or is a software firewall secure enough?

NATHAN WEEKS
Detroit, Michigan

A. Nathan, broadband connections such as DSL, cable modem, and satellite have brought many of us—along with the ability to download massive movie trailers for films we have no intention of viewing—concern similar to the one reflected in your question. Far be it from me to suggest that the companies that market software and hardware firewalls have fed consumers' paranoia by depicting a Web peopled with miscreants. But honestly, for most of us, the level of security provided by a firewall is not worth losing sleep over.

To begin with, most "attacks" from the Web come in the form of port probes by techno-weenies who have failed to develop more-wholesome outside interests. While such probes are annoying, they rarely lead to the takeover of your Mac by a hostile foreign government; for the most part, these weenies just want to see if they *can* access your computer. It's unlikely they'll return to pilfer your carefully assembled database of North American garden beetles. Secondly, Mac OS is reasonably secure—more so than, dare I say it, the many flavors of Windows. Under the pre-X versions of Mac OS, you can tighten that security by switching off the Enable File Sharing Clients To Connect Over TCP/IP option in the File Sharing control panel. With this option turned off, it's much harder for malefactors to access your Mac from across the Web. In addition, you can simply turn your Mac off at night: this will ensure that no funny business takes place during your eight hours of the dreamless.

continues

Tip of the Month

Here are some cool keyboard commands you can use in Apple's iTunes:

KEY	FUNCTION
H or ?	show help
F	toggle frame-rate display
T	toggle frame-rate capping
I	display track info
D	reset settings to default
M	select configuration mode
R	new random configuration (with caps lock key added, configuration is displayed as it changes)
C	display current configuration
Q and W	change pattern
A and S	change shape
Z and X	change color
B	show Apple logo
N	toggle between high-contrast and normal-contrast colors

ZEKE RUNYON
Oxford, Ohio

For those who'd rather be safe than sorry, I suggest Intego's NetBarrier ($60; 305/868-7920, www.intego.com), a software-firewall application. I've installed NetBarrier on my league of Macs and then run some Internet-based port-probing utilities, which found that my network now is indeed far less visible to prying eyes. There are, however, situations in which you're better served by a hardware firewall: when you have a mixed network of PCs and Macs holding data vital to your business, for example. In such cases I recommend the $140 EtherFast Cable/DSL Router, from Linksys (949/261-1288, www.linksys.com).

Mac OS X, on the other hand, is a different kettle of flounder. Few of us are sure how resistant Apple's new OS, with its Unix underpinnings, is to Internet attack. For this reason, I've downloaded and installed Brian Hill's $25 shareware program BrickHouse (http://personalpages.tds.net/~brian_hill), with which you can easily configure the firewall settings built into OS X (see "It's Mighty Mighty"). (If you'd like to join discussions about Mac OS X security, you can post your two cents at Macworld.com's Operating Systems forum.)

Gaining Access

Q. I've put a lot of work into creating a Microsoft Access database containing information about my DVD collection, and I would like to use the database with my new PowerBook G4. I understand that Microsoft doesn't make a Mac version of Access. Is there any way I can use this file with my PowerBook?

JAMIE DICKIE
London, Ontario, Canada

A. I'm pleased to hear you've put a lot of work into this DVD database—it demonstrates that you're the kind of person who's willing to part with a few ounces of good, honest sweat in the pursuit of a desired result. I bring this up, Jamie, because while there's every likelihood that you can use the data in that file on your Mac, you'll have to toil to create a Mac version that's as finely polished as the Access database you now have. Allow me to explain.

You can't just launch any old database application and then open whatever database file you want from within that application. Unlike text and graphics documents that can be opened using a variety of applications, database files are generally in a proprietary format that can't be opened natively in another database application. You can't, for example, bring that Access file over to FileMaker or AppleWorks and expect it to open with everything laid out as it was in the original file.

Instead, you must open Access on the PC and export your data in a form that your Macintosh database is likely to understand—as tab-delimited text or an Excel file, for example. Then construct a layout in your Macintosh database application that mimics the layout in the original file—in your case you'd include fields such as DVD title, actors, director, producer, run time, and personal rating. This Mac database application can be as rudimentary as the database component of Apple's AppleWorks (800/692-7753, www.apple.com/appleworks/) or as sophisticated as FileMaker's FileMaker Pro (408/987-7000, www.filemaker.com).

To bring data into AppleWorks, open your newly created database—with the layout matching that of your original database—choose Insert from the File menu, and then select the exported file you created with your old database. Line up the fields so that they correspond—the Best Boy and Gaffer fields should match in each database, for example—and click on OK to import your old data. With FileMaker the procedure is the same except that you choose Import Records from the File menu. **m**

Contributing Editor CHRISTOPHER BREEN would love to see *your* undocumented tip or trick in print, so send it via e-mail to mac911@macworld.com.

Share tips and discuss Mac problems with other Mac users in the Mac 911 forum (www.macworld.com/subject/mac911). Also send tips by e-mail to mac911@macworld.com. We pay $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).

Macworld and Mac OS X
We're closer than you think.

By the end of 2001, Macworld will test and rate all products based solely on how they perform on Mac OS X. To signify this change, we will take the definitive icon of product quality in the Macintosh market — the Mouse Rating — and give it a fresh coat of paint. Blue paint.

When you see a Blue Mouse in Macworld magazine, Macworld.com, or on product packaging, you will know that we have tested that product's ability to work on the Mac's new operating system, and whether it made the grade. If a product does not work on Mac OS X, either in native mode or the Classic environment, it won't get a rating.

It's that simple.

If you're wondering why Macworld is making such a bold move, it's because our research[1] shows that you, our readers, are already making that bold move: by July, 68% of you will have already purchased Mac OS X. And by year-end, we expect almost all of you to be working to make this new OS your OS.

Macworld will be there with you, delivering the most objective, lab-based buying advice available anywhere. Together, we'll save you some costly mistakes, point you toward the best Mac OS X products and help make your transition to the new OS a positive one.

The Blue Mice are coming.

And that's a very good thing.

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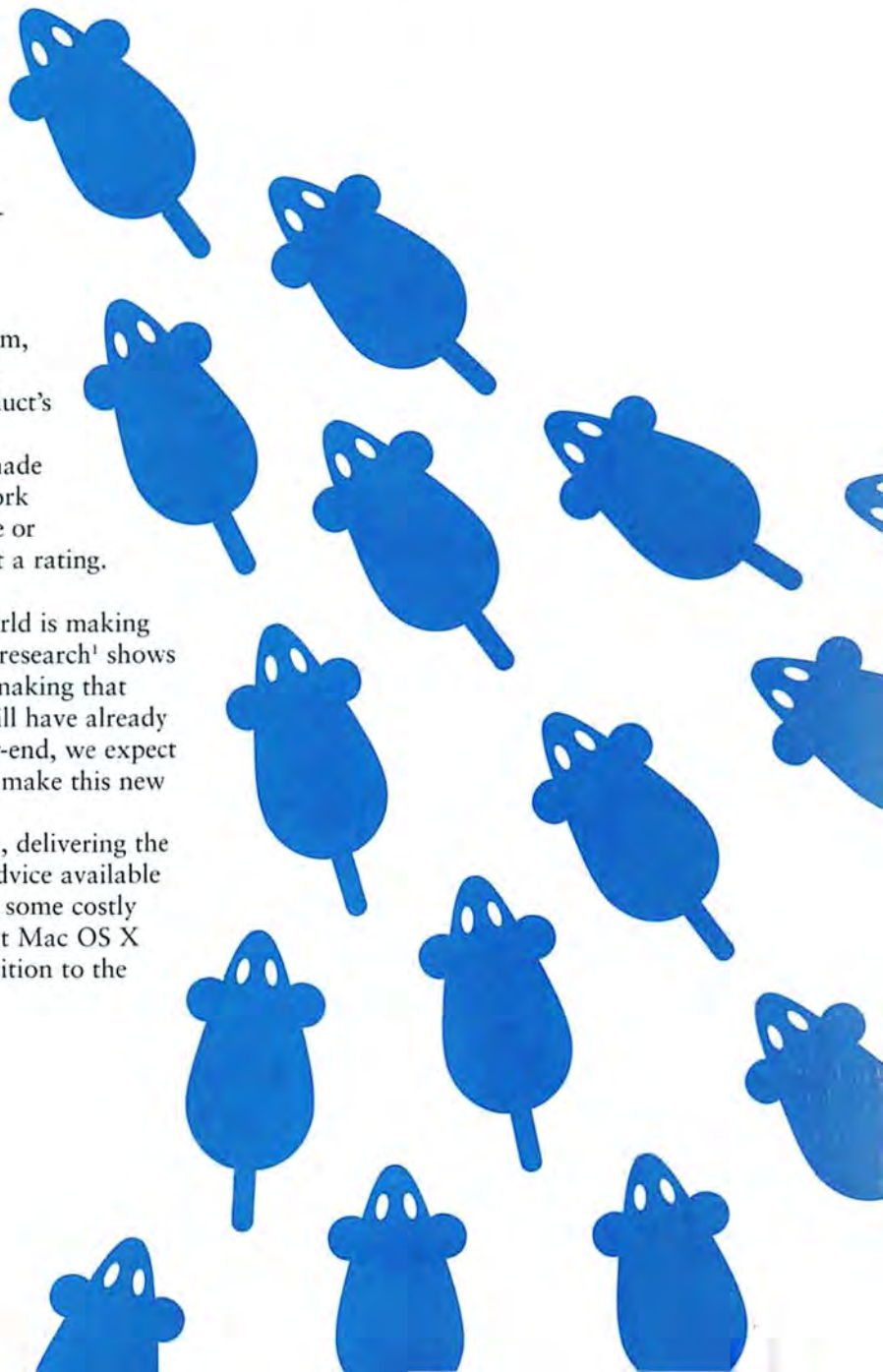

[1] Karlin Associates – Macworld OS X Study, 4/01

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APS Technologies	800-950-2015	110-111
ATI Technologies, Inc.	ati.com	63
CD Cyclone	cdcyclone.com	41
CDW Computer Centers, Inc.	800-509-4239	108-109
Connectix	connectix.com	79
Corel Corporation	800-722-6735	10
Crucial Technology	crucial.com	55
Epson America, Inc.	1-800-BUY EPSON	8-9
Fujitsu	fcpa.com	35
Hewlett Packard	hp.com/go/digitalimaging	53
IDG World Expo	macworldexpo.com	94-95
Interland, Inc.	877-472-7189	75
J&R Computer World	800-221-8180	113
Kensington	kensington.com	BC
MacMall/Creative Computers	800-222-2808	96-103
MacSoft	gtstore.com	42
MacZones	maczone.com	104-107
Maxell	maxell-data.com	69
MegaHaus	800-786-1184	112
MicroMat	800-829-6227	20
Microsoft	microsoft.com/mac	6-7
MyFonts.com, Inc.	myfonts.com	41
NEC/Mitsubishi	necfp.com	37
Nikon Electronic Imaging	nikonusa.com	4
Roxio	roxio.com	141
Seybold	seyboldseminars.com	76
Snap Appliances	snapappliances.com	75
Sonnet Technologies	800-786-6260	33
Thursby Software Systems	thursby.com	83
VST Technologies, Inc.	vsttech.com	16
Xante Corporation	xante.com	2-3

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PAGE NO.	ADVERTISER	GET-INFO
ACCESSORIES		
FURNITURE		
15	Anthro	–
HARDWARE		
COMPUTER SYSTEMS		
C2-1	Apple Computer	–
96-103	MacMall/Creative Computers	132
104-107	MacZones	72
16	VST Technologies, Inc.	74
HARD DISK STORAGE		
110-111	APS Technologies	56
41	CD Cyclone	127
55	Crucial Technology	–
35	Fujitsu	–
112	MegaHaus	108
MISCELLANEOUS		
13	American Power Conversion	73
41	CD Cyclone	127
79	Connectix	106
55	Crucial Technology	–
BC	Kensington	1
69	Maxell	24
MONITORS/ GRAPHICS BOARDS		
63	ATI Technologies, Inc.	114
37	NEC/Mitsubishi	20
33	Sonnet Technologies	133
NETWORKING PRODUCTS		
75	Snap Appliances	--
PRINTERS		
8-9	Epson America, Inc.	–
53	Hewlett Packard	12
2-3	Xante Corporation	113
SCANNERS & DIGITAL CAMERAS		
45	Nikon Electronic Imaging	59
MAIL ORDER		
110-111	APS Technologies	56
108-109	CDW Computer Centers, Inc.	2
113	J&R Computer World	57
96-103	MacMall/Creative Computers	132
104-107	MacZones	72
112	MegaHaus	108
SERVICES		
INTERNET PRODUCTS/SERVICES		
75	Interland, Inc.	11
TRADESHOWS/CONFERENCES		
94-95	IDG World Expo	–
76	Seybold	–
SOFTWARE		
BUSINESS/PRODUCTIVITY		
14	AEC Software	84
6-7	Microsoft	–
41	MyFonts.com, Inc.	139
83	Thursby Software Systems	124
ENTERTAINMENT		
42	MacSoft	30
GRAPHICS/DTP		
10	Corel Corporation	79
MULTIMEDIA		
141	Roxio	–
UTILITIES		
38-39	Alsoft	140
20	MicroMat	37

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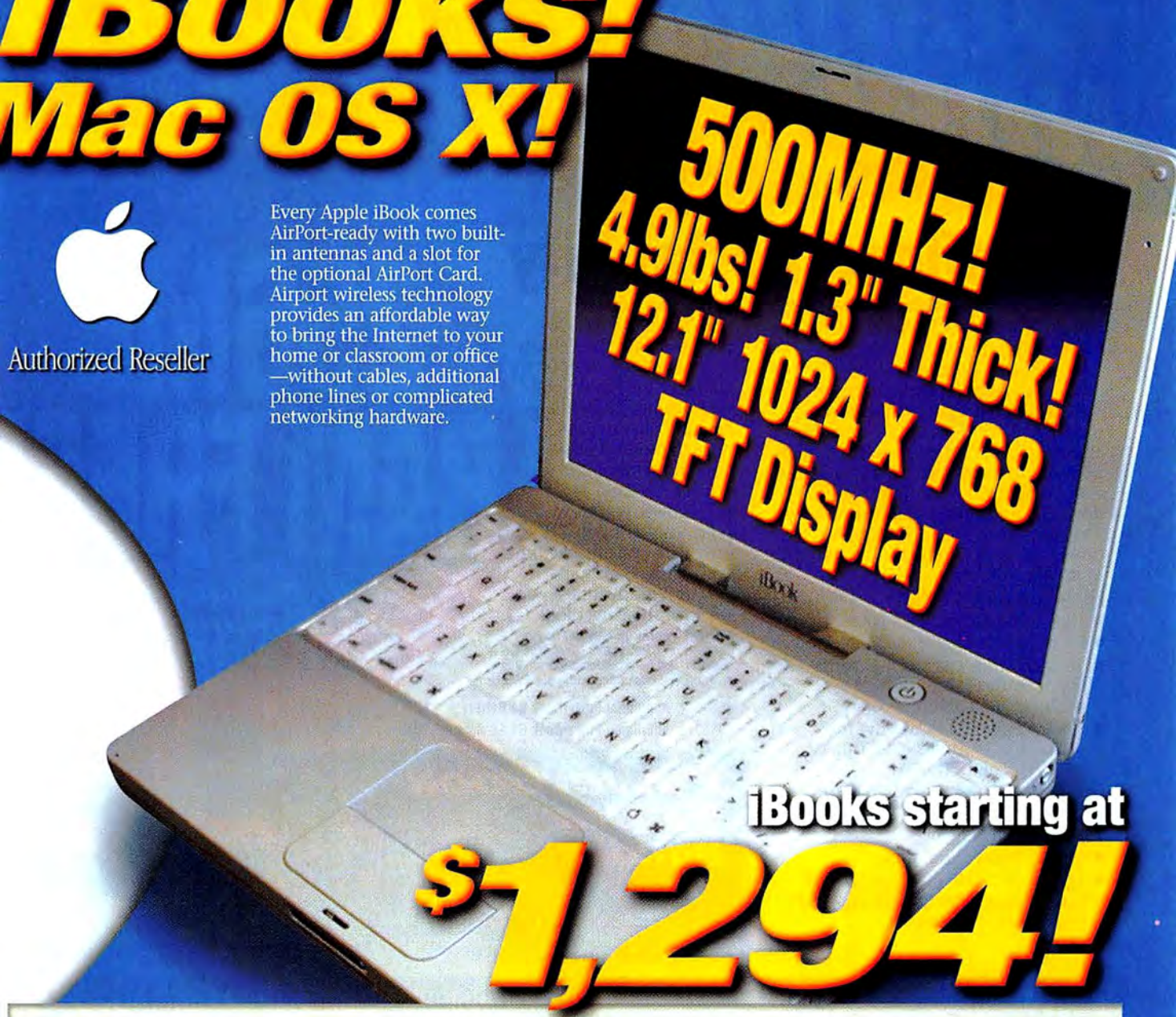

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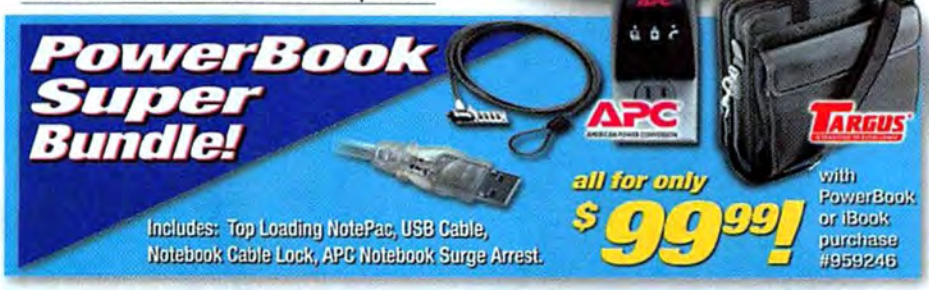

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- Standard VGA output (15-pin mini D-Sub); support for video mirroring

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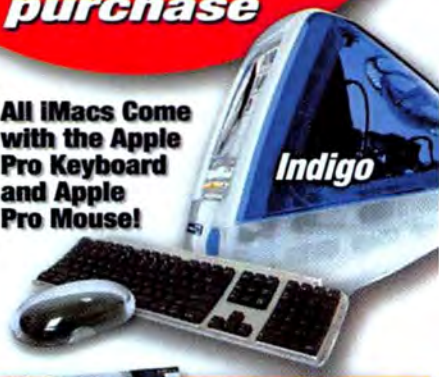

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†Most applications are preinstalled, though some may require downloads. Product contains electronic documentation. Backup software is provided on CD-ROM. Mac OS X software may not be pre-installed on CPU. In this case, Mac OS X software will be provided separately in promotional packaging with your CPU order.

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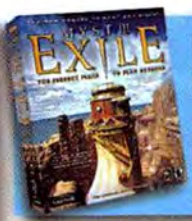

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Indigo (#957490)

MHz	400
RAM	64MB
FREE RAM	64MB
TOTAL RAM	128MB
Hard Drive	10GB
CD-ROM	YES
56K Modem	YES
USB Ports	2
FireWire Ports	2
iTunes and iMovie 2	YES

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Flower Power (#957493), Blue Dalmatian (#957492), Indigo (#957491)

MHz	500
RAM	64MB
FREE RAM	128MB
TOTAL RAM	192MB
Hard Drive	20GB
CD-RW	YES
56K Modem	YES
USB/FireWire Ports	2
iTunes and iMovie 2	YES

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Flower Power (#957496), Blue Dalmatian (#957495), Graphite (#957494)

MHz	600
RAM	128MB
FREE RAM	128MB
TOTAL RAM	256MB
Hard Drive	40GB
CD-RW	YES
56K Modem	YES
USB/FireWire Ports	2
iTunes and iMovie 2	YES

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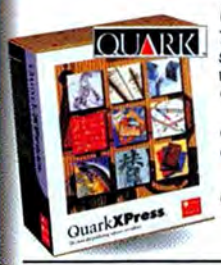

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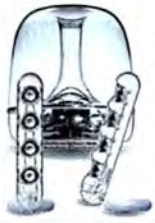

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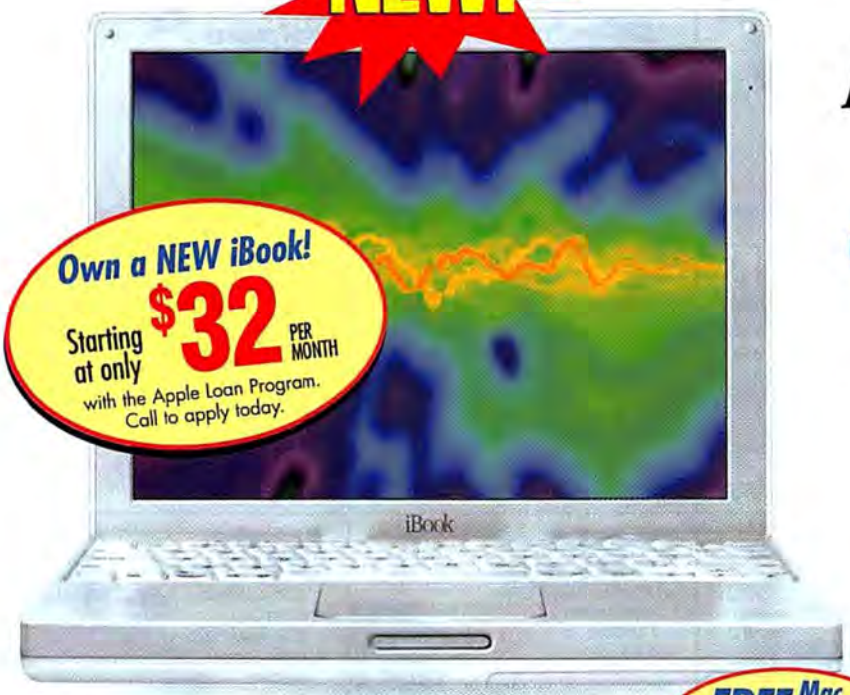

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Develop & Wait You'd look for coupons and wait for sales on film developing. Then you'd drop off your film at your local drugstore and wait, all the while hoping most of the pictures would turn out all right. No instant gratification here, even with a one-hour photo center.

Store You put your photos into an album, so people could sit next to you and wait patiently as you flip through it. You turned some into 35mm slides and put your friends to sleep with a barrage of static images. The rest went into shoe boxes or junk drawers. Not exactly the best way to share and store your memories.

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- Up to 256K L2 and 1MB L3 cache

Settling for less can cost a lot. If you're still using a beige Power Mac G3 to render images in Photoshop, design 3D graphics or batch-process digital video, you're potentially losing a lot of time and money.

"I'm getting results [with the Power Mac G4] that point to an increase of two to 20 times the performance for Photoshop tasks.... Simply put, the more jobs you can do in a day, the more money you can make." – Chris Cox, hardware guru at Adobe, as quoted on Apple's website

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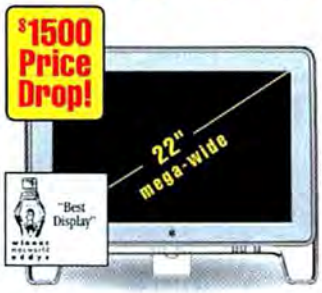

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RAM	128MB	128MB	128MB	256MB	256MB
Optical Drive	CD-RW	CD-RW	CD-RW	CD-RW	SuperDrive
Graphics Card	ATI RAGE Pro 128/16MB	NVIDIA GeForce2 MX/32MB	NVIDIA GeForce2 MX/32MB	NVIDIA GeForce2 MX/32MB	NVIDIA GeForce2 MX/32MB
FireWire/ USB	2 Ports ea.	2 Ports ea.	2 Ports ea.	2 Ports ea.	2 Ports ea.
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Cache	1MB L2	1MB L2	1MB L2	256k L2 1MB L3	256k L2 1MB L3
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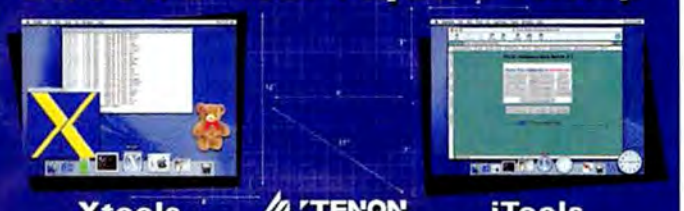

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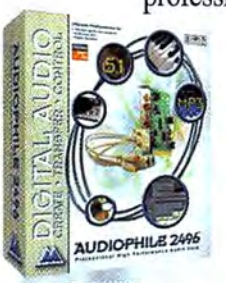

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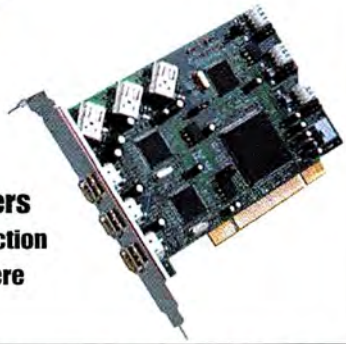

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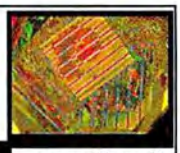

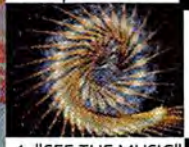

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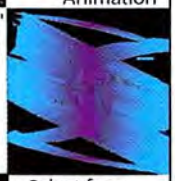

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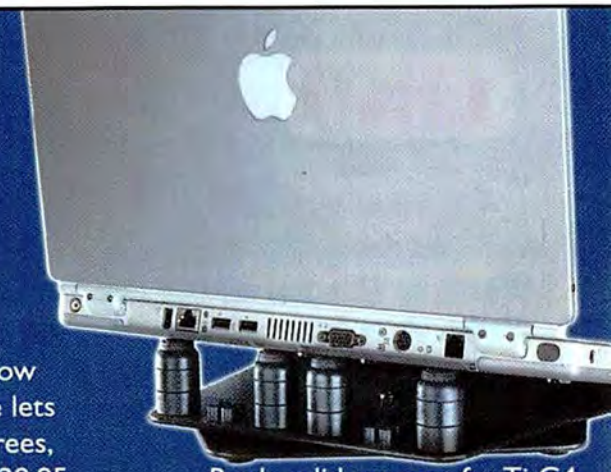

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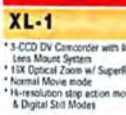

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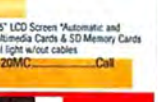

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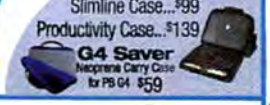

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continued from page 140

day I'd jump up and down on my clock radio once too often, necessitating a replacement, and would I be willing to spend an extra $15 for . . . ?

This is the sort of stuff Bluetooth's backers are betting on. Your car reports from the driveway that the oil and gas are low, your TiVo sends an alert to your Palm that the Bob Elliott episode of *Newhart* will air on Thursday, all the doors to your house automatically lock if you try to exit wearing a pair of those Old Navy pants—*baaaad* craziness.

But while it's possible to purchase a Bluetooth-enabled phone if you look hard, finding Bluetooth accessories for it is possible only in the same sense that it was possible for that California zillionaire to buy a vacation on the International Space Station. Sure, you've read about it, so you know it's possible, but www.sendarichguytospace.com comes back 404, and no one will tell you where to send the check. Microsoft has even dropped Bluetooth support from its new "No, really, *this* time it's *really* as simple as a Mac, honest" rewrite of Windows.

Pod People

Where's Apple in all this? Playing it safe. It's not going to do anything to *prevent* Bluetooth from working with Macs, but it's also not particularly interested in encouraging development. This could turn into the same sort of misstep that Apple made when it didn't bother to put CD-RW drives in new Macs last year.

The thing is, Apple shouldn't see Bluetooth as competition for AirPort, which (along with all of the other networking hardware that embraces the 802.11b Wi-Fi standard) is gaining broad acceptance. AirPort and Bluetooth complement each other really well. Bluetooth is a swinging-seventies technology: casual, random, cheap, and easy—a quick linkup that gets the job done without a big preamble. AirPort, in contrast, is sturdy and reliable, a technology to use when you're building for the long term.

And Bluetooth has the capacity to become another Pod People technology, the sort of feature that instantly turns a company's customers into members of the sales force. Anyone who owned a Newton is familiar with the syndrome. If you used a MessagePad 2100 on an airplane, suddenly you were the pope of row 21. It drew people in. People wanted demos. They couldn't believe what you could do with it, and then all of a sudden *that* thing, that *logo* was what everyone simply had to have.

Someday, even those people who aren't dating major geeks will have alarm clocks that can operate in cahoots with their coffeemakers. It'll be a damned shame if visitors to their houses ask to see the little plastic box that makes all those cool things happen—and don't see an Apple logo on it. **m**

ANDY IHNATKO (www.andyi.com) is fairly certain that his toaster is plotting against him.

ANDY IHNATKO

The Best Part of Waking Up

Your Mac and Your Appliances Can Talk to One Another—Be Very Afraid

ACTUALLY, IT WAS A LOT easier than I thought it would be. Open up my sweetheart's coffeemaker, install a mechanical relay to switch it on and off, design and install a light sensor that detects when the Coffee Ready light turns on. Alter her clock radio's snooze button with some more custom circuits. Wire them both into X10 modules attached to my file server. Write a bunch of AppleScripts to oversee and control the whole mess. *Bango*. That's all there was to it.

OK, my sweetie didn't understand it, either. But she didn't care. Her alarm clock continued to work as usual. The big difference was that now, when she slapped the snooze bar and returned to the Starship of Chocolate Elves, my Mac started her coffeemaker, and when and *only* when the coffee was actually ready, my file server terminated her alarm clock's snooze mode.

It worked flawlessly. She went absolutely nuts for it and didn't dump me until after I'd added scripts that independently analyzed, charted, and Web-published her pots-per-day consumption and snooze-to-brew performance timeline.

You should distill three messages from this tale. First, a geek's expressions of devotion tend to skip right past the trite candy-and-flowers stuff and go straight to things that might cause all of your combined possessions to burn to ash. Second, I'm now available, gals. Third and most importantly, wonderful things can happen when simple gizmos have the ability to work together.

Which brings us (after I take a moment to reemphasize that second point) to Bluetooth.

On the Fly

Bluetooth is a standard for wireless connectivity, or in plainer language, it allows devices to use radio rather than wires to communicate with one another. It's sort of like Apple's AirPort, but on a cozier scale. Bluetooth devices can find each other and link up automatically. You power it up, and *bango*—it's talking to other Bluetooth devices.

Bluetooth can manage only a tenth of AirPort's speed. And while AirPort can communicate across a football field—including both end zones—Bluetooth reaches only about as far as you can throw a paper airplane. But when it comes to simplicity and convenience, Bluetooth's the winner. Right from your pocket, your Bluetooth-enabled handheld device can sync to your computer the moment you step into the office. No connecting cables, no configuration.

People don't really "get" Bluetooth yet, and it's no wonder: at present, it's promoted primarily as a cable eradicator. Granted, that's a strong draw if your boss is regularly *beating* you with the things, but now that almost anyone can post a resume on Monster.com and supposedly find themselves a better job, surely that market is shrinking fast.

Bluetooth's proponents should really be touting it as a simple, low-power, and (hopefully) *dirt-cheap* way to get devices talking wirelessly. A Bluetooth-enabled cell phone projects a bubble of network access, 20 meters in diameter, all around itself. If that phone is in your pocket, the PDA in your hand can get e-mail; if that phone is in a backpack in the trunk of your car, the hands-free kit clipped to your ear can place and answer calls.

About 2,500 companies, from IBM and Microsoft on down, are participating in the development of Bluetooth—but the companies that are *not* in the geekware business are asking the most interesting questions. What if—as promised—Bluetooth really *does* become simple and inexpensive enough to go into familiar appliances? I wouldn't spend $280 on a "Wake Me When the Coffee's Ready" percolator. But would I spend an extra $15 for a coffeemaker with Bluetooth? Absolutely. I'd get no use out of it for months, certainly, but one

continues on page 139

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