EXCLUSIVE! MAC OS X BETA PREVIEW

You Can Try Out Apple's First Modern Mac OS, page 40B

Macworld

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New Multiprocessor Macs: They're Cheap, but Are They Really Twice As Fast? page 44

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Incorporating MacUser

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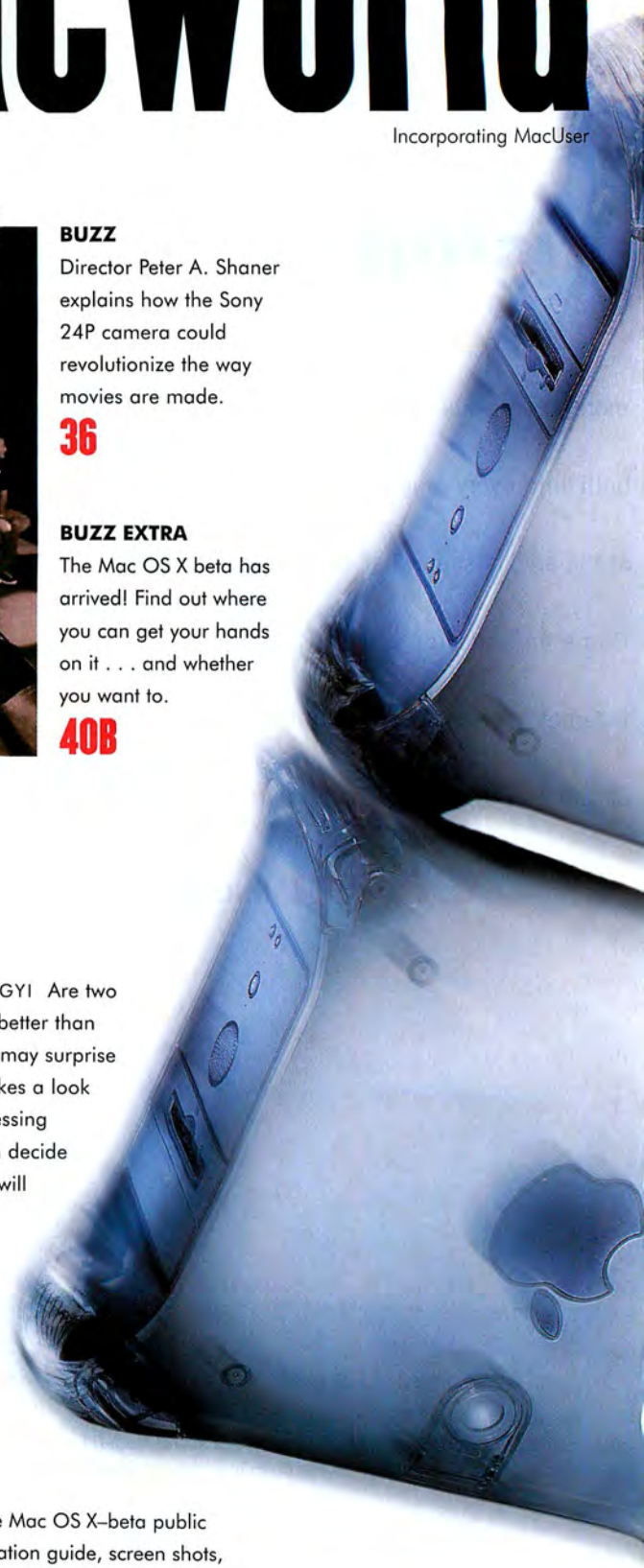

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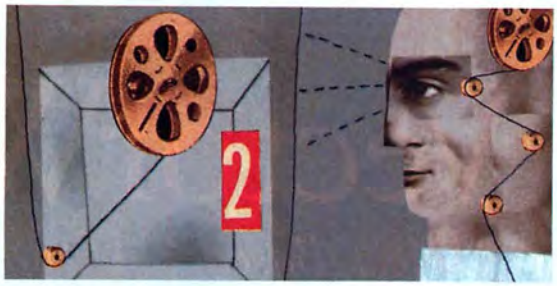
Get in-depth coverage of the Mac OS X–beta public release—including an installation guide, screen shots, and more—at www.macworld.com/subject/macosx.



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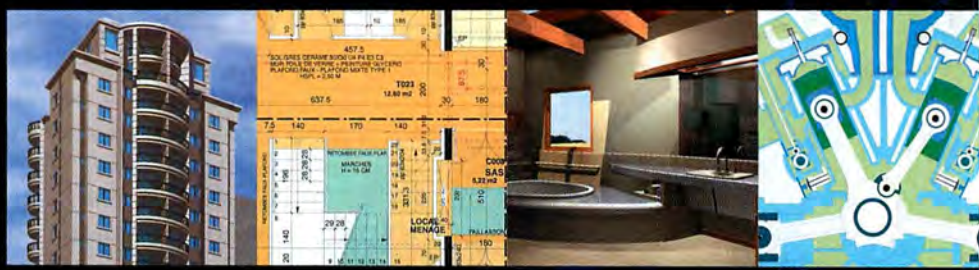

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ANDREW GORE

Dawn of a New OS

MAC OS X'S ARRIVAL IS OUR OPPORTUNITY TO SHAPE THE FUTURE OF THE MAC PLATFORM

This is a historic moment. For the first time, Mac users have a chance to try an entirely new Macintosh operating system. More than a face-lift, update, or collection of enhancements, Mac OS X is the future. It represents the best Apple has to offer—the latest thing in stability, performance, and human interface. And history teaches us that we will be living with this new Mac OS for a long, long time.

And we Mac users have as much responsibility in helping to ensure Mac OS X's greatness as Apple does.

This is a call to action. It is the duty of all Mac users who care, *really* care, about the future of the Mac to get a copy of the Mac OS X beta, load it onto a computer, and pound the hell out of it. Write everything down—what works, what doesn't work, and what could work better. Then post your comments to the feedback site Apple has set up especially to gather input on the beta test program.

And then, just to be certain Apple really is listening, go to Macworld.com's Mac OS X feedback forum at www.macworld.com/subject/macosx/forum.html and post it again. Discuss the OS among yourselves. Exchange ideas, discuss discoveries, and diagnose problems. As *Macworld*'s editor in chief, I commit this magazine and Web site's resources to giving you the most-up-to-date information on Mac OS X and third-party support. We will help you understand and ultimately exploit what will be the single most important advancement ever to hit the Macintosh. Macworld.com will be a comprehensive resource and an active community of Mac OS X–beta testers.

Hear and Now

Apple doesn't always have the best track record when it comes to listening to its users. Take the introduction of the original iMac mouse. While reaction to the round mouse was almost universally negative, it took Apple two years to redesign its standard input device. But while users may have objected to a hockey-puck mouse, it was a problem that could be solved with the judicious application of a few dollars. It wasn't really that big a deal.

But an operating system is forever. Whatever we ultimately get at the end of this beta process, we will have to live with, every minute of every day, for a long time to come. We need to make sure it's what we want and need.

The operating system is what the Mac is all about. Sure, cool industrial design makes your Mac distinctive and might even make it a bit more useful, but the OS is what it's all about. If you can't get your work done using Mac OS X, you're not going to be using it for long, no matter how cool your Mac looks sitting on your desk. And while I don't for a minute think Apple

continues

would ship an OS that didn't work, the devil is in the details. It's up to us to communicate how Mac OS X could work better for us.

We will have no one to blame but ourselves if this new Mac OS doesn't offer the best user experience in the computer industry.

OS X Test Track

Apple is already showing signs that it's prepared to listen to its customers when it comes to Mac OS X. When the company showed off the new OS at its Worldwide Developers Conference in May 1999, the Finder had been replaced with a Next-style file browser. As you'll see in the Mac OS X public beta, the Finder is back in all its glory. Even interface idiosyncrasies, such as placing files on the desktop (and not being able to tell which volume they actually live on) will be maintained. And you'll still have the ability to view files in a browser.

But what about the Dock? Does it behave the way you expect it to? How could it be better? How's that Classic-application compatibility? Do Classic Mac apps do everything they're supposed to? How's that legendary Mac OS X stability? Is it really crash-proof? Apple wants to know the answer to these questions as much as you do. Otherwise, why bother doing a public beta at all?

It's really a bit like getting the keys to a new experimental racing car and being told, "Sure, take it for a few laps around the track. Knock yourself out and let us know where it tops out."

You, *Macworld*'s readers, are the best test drivers Apple could ever hope to have. Macintosh users are in large part the reason the Mac has always embodied a better way for people to use computers. It's true, we're very loyal—but we're also very demanding of our computing platform. It's time to put our critical natures to work, no holds barred, and help Apple build the best possible Mac OS it can.

Mac OS X is the riskiest move Apple has made since Steve Jobs came back to run the company. But, as with most bold and risk-filled ventures, the payoffs are enormous. If Apple succeeds, it will have delivered what others have only talked about—a fully modern operating system that can be used by anyone from kindergartners to rocket scientists. Not even Microsoft has managed to achieve this goal, and not for lack of trying.

Apple knows that with your help, it stands a much better chance of achieving this goal. And I, for one, want the company to achieve it—because I want to use that operating system: an operating system built by the most innovative computer company in the world and hundreds of thousands of the world's most demanding, nitpicky, and loyal computer users. **m**

ANDREW GORE is *Macworld*'s editor in chief. To comment on this column, please visit the Vision Thing forum at www.macworld.com/columns/visionthing/forum.html

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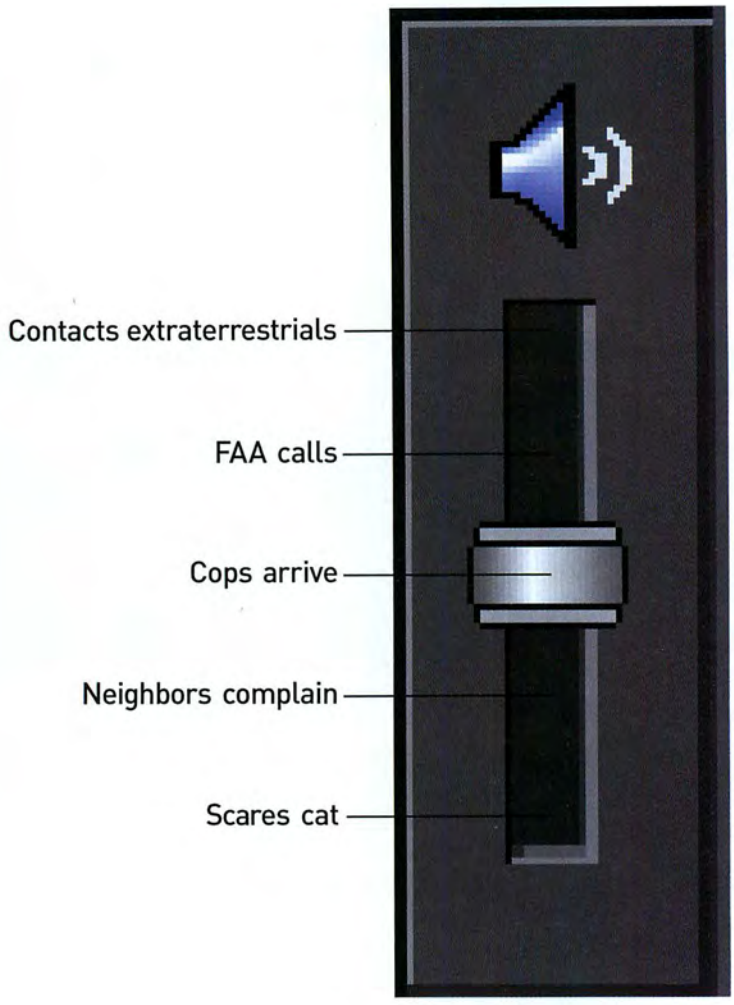

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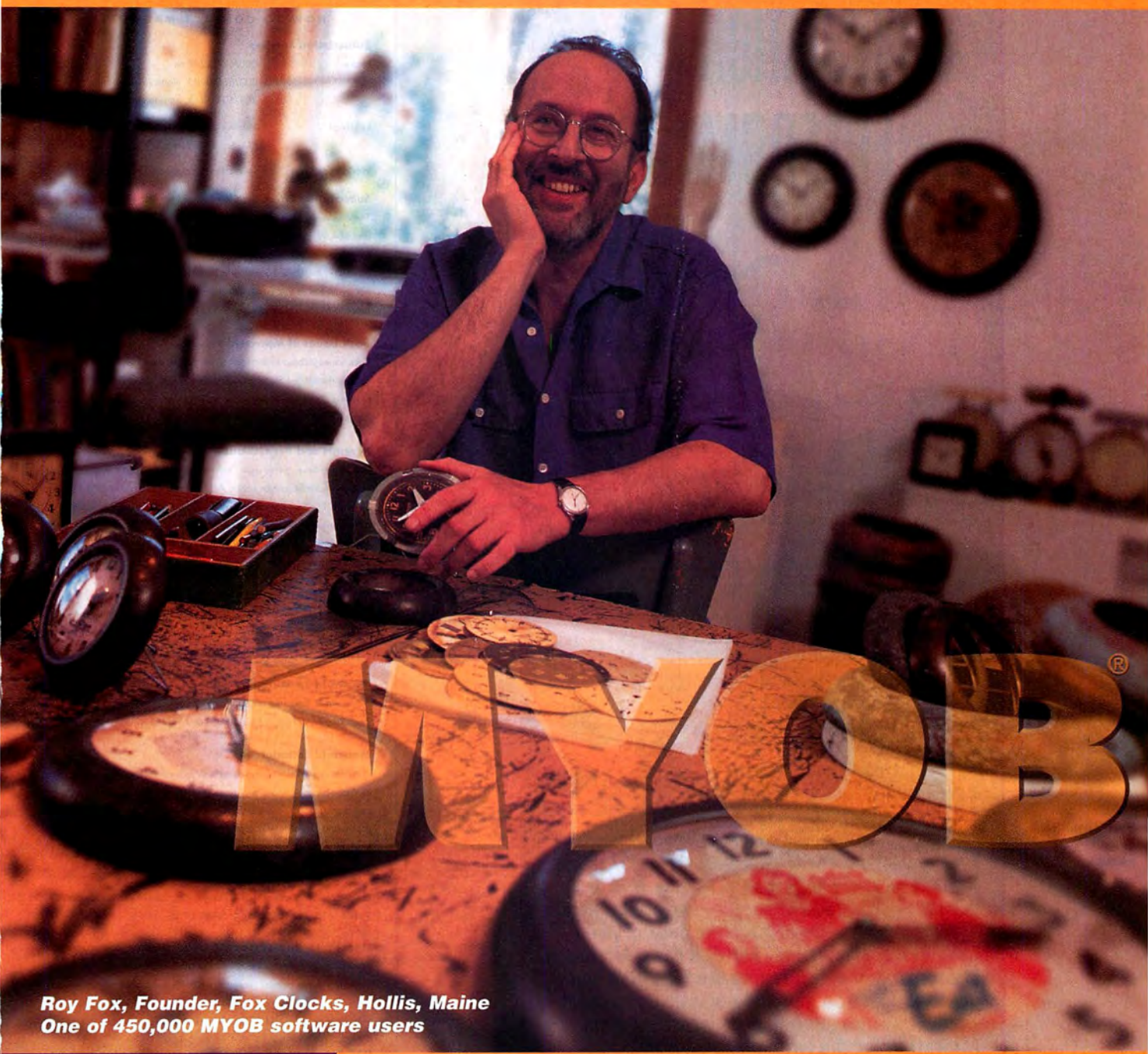

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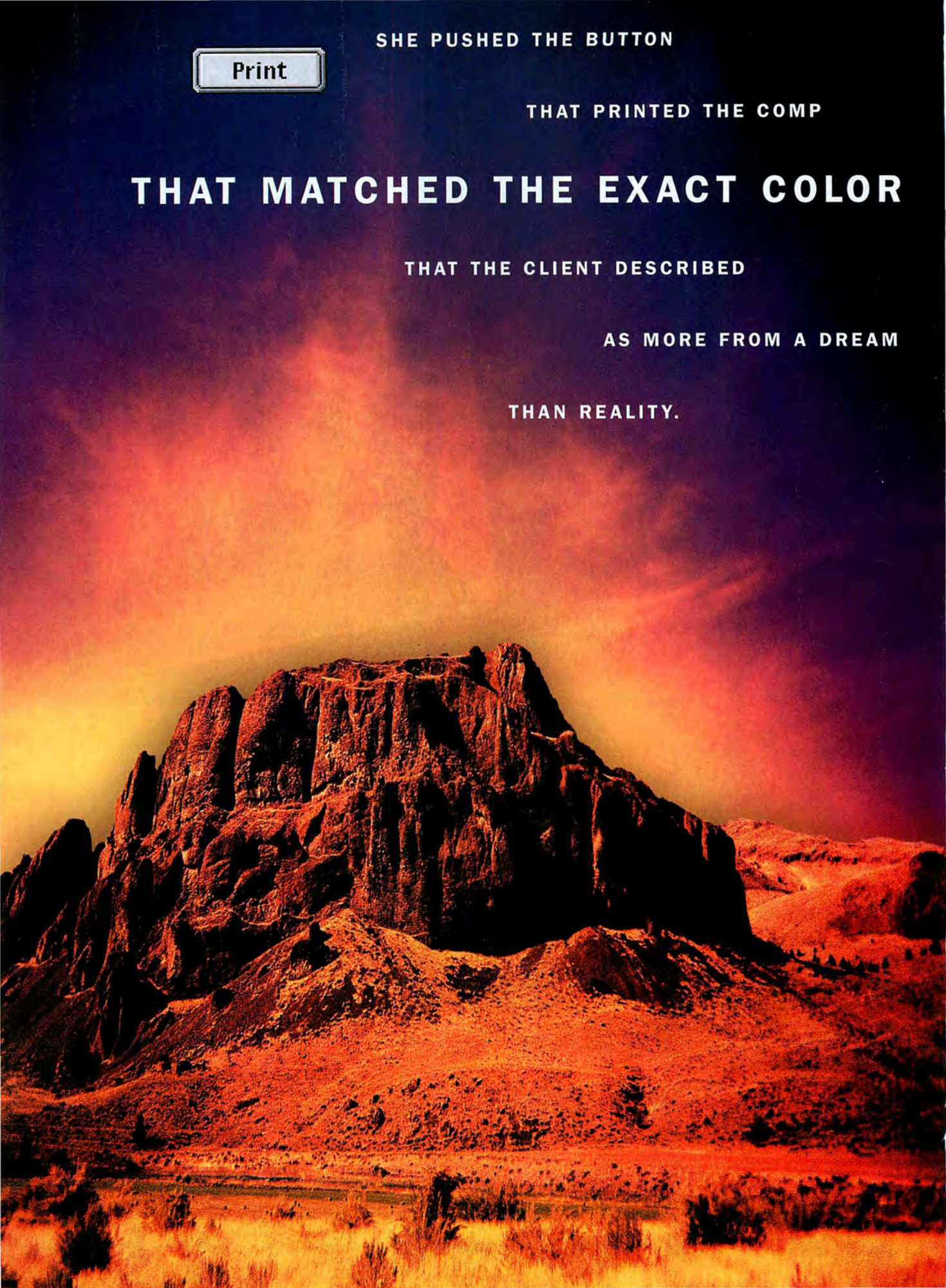
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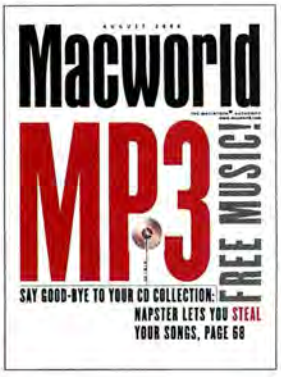

Feeding the Mouths That Sing

We are concerned with your August 2000 cover. The word *steal* is highlighted in red so as to catch the reader's eye. We understand your wish to sell more magazines, but we object to your willingness to propose outright stealing by the use of such an inflammatory tactic. To be fair, the article inside is fairly evenhanded. However, how would you like it if our organization published a newsletter with a cover tease about "stealing" copies of *Macworld*? For the record, we represent the professional musicians of St. Louis, Missouri. Our members' skills and talents make it possible for the students you mention in your article to have music to enjoy in the first place. If you starve the golden goose, you will have no golden eggs to enjoy.

Nancy R. Schick,
The Board of Directors,
Musicians' Association of St. Louis
St. Louis, Missouri

About "Steal This Song" (August 2000): the real issue is a creator's inherent right to receive fair compensation for her creation. The fact that technology provides the means to acquire something without paying for it doesn't make doing so morally acceptable or economically wise. In an information-driven economy, everyone must support and protect the value of intellectual property, or ultimately all of us will be out of work.

Bill Anderson
Atlanta, Georgia

You've Got an Upgrade

Although I hesitated before upgrading from America Online 4.0 to 5.0 (*Reviews*, August 2000), I ultimately decided to give it a try. I connect every time I log on. I can send pictures in e-mail messages, I can "sign" my e-mail, and most importantly, I can retrieve e-mail that I've deleted within the past 24 hours—a feature I've used a number of times. I have no use for the My Calendar, My Places, or You've Got Pictures features found in 5.0, so I don't use them. But I wish AOL had put separate history trails in the tool bar for each user.

David Lubin
Tampa, Florida

I never thought I would say anything in favor of America Online, but your giving AOL 5.0 a score of ½ failed to acknowledge one of its strongest features: reliable, worldwide TCP/IP Internet access. AOL is the only Internet access provider that could connect me in Barcelona, London, and all of Latvia. The AOL 5.0 client is clean and reliable and allows me to bypass its own Internet tools in favor of Eudora Pro and Netscape Communicator. Furthermore, people have lured me into using AOL Instant Messenger, a perfect tool for making Europe seem only a few miles away.

Michael Dexter
Portland, Oregon

Routing Words

Thanks for your review on broadband Internet routers (*Reviews*, August 2000). However, it contains a mistake. The review states: "[Software routers] require a dedicated computer." I've been using

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Vicomsoft SurfDoubler on my wife's G4, networked with my G3, to access our DSL line. While her G4 functions as a software router, Web server, and file server, she can do everything she needs to do: desktop publishing, word processing, e-mail, browsing, etc. No dedicated machine required.

John DiPetto
New York, New York

The computer acting as a router doesn't have to be dedicated to the task but must remain on if other connected computers are to be able to access the Internet.—Ed.

Speedmark 2.0

Using Speedmark 2.0 sounds like a good idea (*Reviews*, August 2000). Sure, the new PowerBook is faster, but does speed make a difference to me? It sounds as though Speedmark will be able to answer that question.

Can you explain Speedmark scores as you did MacBench scores (include a blurb in the tables with Speedmark measurements and scores)? And could you print a review of the software and let us download and try it?

via the Internet

We are unable to distribute Speedmark because it's based on a series of real-world commercial applications, such as SoundJam, Quake, and Microsoft Office. For more information, visit www.macworld.com/speedmark.—Ed.

Thanks

I just read "Create a Barrier-Free Web Site" (*Create*, August 2000). Thanks for such a helpful piece. I run a Web site for a nonprofit that helps many people with disabilities, but I hadn't seen a good how-to for improving the site's accessibility. Our clients will thank you, too, once I implement some changes.

Scott McCormick
Berkeley, California

Error: 404?

After reading "The Dawn of a New Error" (*Desktop Critic*, August 2000), I had to come to Apple's defense. Although I agree that Apple's error messages are cold, it seems that the company is at least trying to change the relationship between its hardware and the user. Turn your AirPort Base Station or your new iBook power supply over and read the bottom!

Mark R. Burch
Albrightsville, Pennsylvania

Yes, the new iBook's power supply amiably announces, "i was assembled in Thailand."—Ed.

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Feedbag

There may be few guarantees in life, but we've stumbled upon one: people just love arguing about Napster. After our cover story on Napster ("Steal This Song," August 2000), our mailbox and message boards were filled with comments about the music-sharing service.

But one reader took it upon himself to attack the *true* evil: libraries. "[They] take artists' *copyrighted* work and distribute it for *free*—despite *never* having received permission to do so," he writes. "They wrest control of valuable work out of the hands of artists—libraries are nothing more than greedy thieves."

Another astute reader offered a revelation about downloadable music: that Todd Rundgren is, "as usual, a visionary." True, "Hello It's Me" is a personal favorite of ours, but we'd rather work than listen to "Bang on the Drum All Day" all day.

Other readers had pessimistic outlooks on the idea of downloadable music. One remarked that today's Napster is tomorrow's disaster for movies, TV, and anything you can digitize. We couldn't agree more. When we start seeing digitized versions of *The Love Boat*, the end is nigh.

On another note, Mac users are often questioned about why we love our Macs so much. University student Jason Hackworth wrote us boasting about the looks people give him when he totes around his tangerine iBook, but he asked, "How can I justify my love for Macintosh?" Well, you could always take the Madonna approach: wrap your iBook in leather and dance with it in the quad (until the campus police drag you away).

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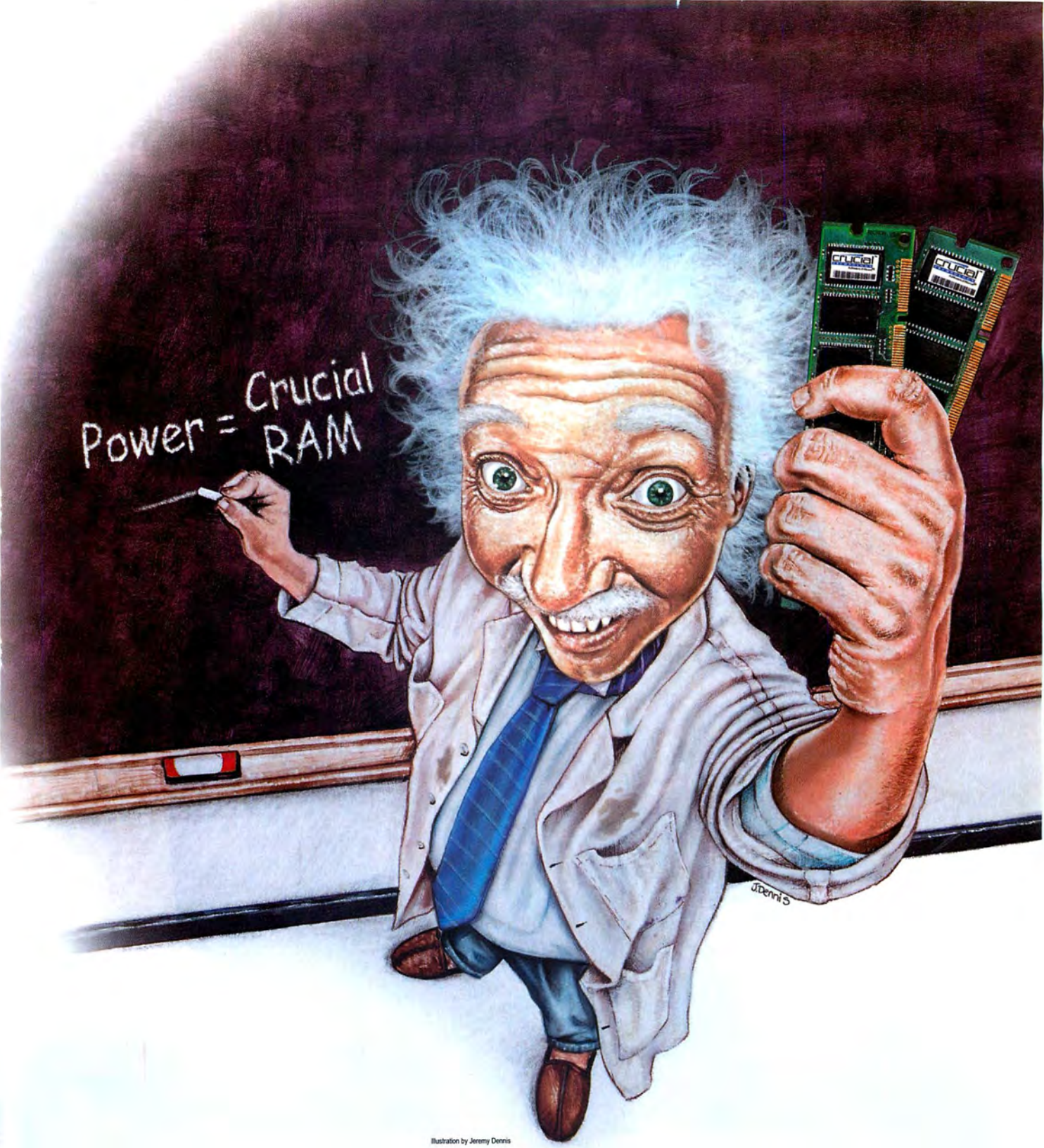

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PHOTOSHOP TURNS 10

Few products are as important to the Mac as Photoshop. It helped drive the desktop publishing revolution, and it's been a valuable tool in the emergence of Web design. As Photoshop 6.0 hits the streets—the $609 package should be available when you read this—it's time to look at how Photoshop has evolved in the decade since its debut, and what the program has meant to Mac users.

There is no greater glory than becoming a verb. Font maven Kathleen Tinkel bestowed that honor on me after I gave her the world's best garlic press: she later told me she no longer presses garlic, she "Blatnerizes" it.

It happens with products, too. People xerox important papers, even on Canon copiers, and later Fed Ex them, even if they use Airborne or another overnight delivery service.

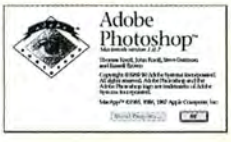
Only one application in the world of publishing has enough distinction to earn its own verb, and it's worth every accolade: Adobe Photoshop.

As far as I'm concerned, every picture you scan needs to be Photo-

PHOTOSHOP THROUGH THE YEARS:

Think back to February 1990. A fellow named George Bush was in the White House. An all-boy band named New Kids on the Block was tearing up the pop charts. Nobody could find Kuwait on a map. And Photoshop 1.0 had just arrived.

Now flash ahead ten years to fall 2000. Another fellow named George Bush is trying to get into the White House. An all-boy band named 'N Sync is tearing up the pop charts. Nobody



Photoshop 1.0

Shipped February 1990

Features: Full palette of tools for creating images from scratch, as well as for editing, altering, and enhancing existing artwork.

What We Said Then:
"Photoshop is easy to use. Considering the vast number of features and tools involved..., Adobe has done a good job of keeping things organized and simple."

No Rating

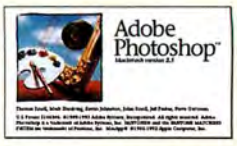
Photoshop 2.0

Shipped June 1991

Features: New and enhanced features for black-and-white image editing, prepress color-separation work, and importing rasterized Illustrator-compatible files.

What We Said Then:
"With version 2.0, Photoshop has grown up to become a graphics standard, with a whole host of third-party developers offering dedicated support."

No Rating



Photoshop 2.5

Announced November 1992

Features: Dodge and Burn tools, masking feature, support for Kodak Photo CD, JPEG, PCX, and BMP files.

What We Said Then:
"Version 2.5 builds on its predecessor's wide range of capabilities; it also ignores some minor weaknesses that have begun to peek through the chinks in the great program's armor."

Rating: ★★★★

shopped. Images headed toward the Web need Photoshopping. People Photoshop files in design firms, video-production houses, animation studios, and ad agencies all over the world. Physicians and scientists Photoshop their X rays, MRIs, astronomical data, and stuff I've never even heard of. Uncle Vernon didn't make Thanksgiving last year? You know what to do: just Photoshop him into the snapshot later.

Adobe Photoshop is easily the most life-changing program in publishing history. It is the cornerstone of print and Web publishing—its power matched only by its elegance—and plug-ins and page-layout programs dance around it.

Today, fine artists add finishing touches by Photoshopping their artwork, and pornographers would have nothing but reality to offer if they didn't Photoshop every one of their images. Photoshop means that a schmo like me can create brilliant graphics for an astonishing variety of media. And if I don't like what I see, I can Photoshop it some more.

But what truly amazes me is that while I write what sounds like an oversweetened eulogy for a poor, dead product, Adobe is releasing a new version—Photoshop 6.0—that'll let me Photoshop my pictures even better than before.

God bless the United States of Photoshop.—DAVID BLATNER

CROPPED OUT

Photoshop isn't the only image-editing software for the Mac—"Darn right," says Fireworks maker Macromedia—but it certainly ranks as the most enduring. Rival products have come and gone over the past ten years, and Photoshop is still standing tall. Here's a list of some of the competing image-editing applications that Photoshop has left in its wake.

- **COLOR STUDIO**
- **DIGITAL DARKROOM**
- **PIXELPAINT**
- **PHOTOPAINT**
- **COLORMACCHEESE**
- **COLOR-IT PRO**
- **XRES**
- **LIVE PICTURE**
- **QUARK XPOSURE**

A DEVELOPING STORY

can find Kuwait on a map. Still.

At least *some* things change—for example, Photoshop. Version 6.0 adds vector tools, expands Web-design capabilities, and incorporates many changes aimed at making the program easier to use.

To show you how Photoshop has evolved over the years, we've listed major additions to each upgrade, as well as what *Macworld* had to say about the software at the time. (Back in the days of Photoshop 1.0 and 2.0, we didn't even give ratings—another thing that's changed.)—PHILIP MICHAELS

Photoshop 3.0

Announced June 1994

Features: Introduction of layers, new color-correction tools, new Commands palette, new drag-and-drop feature.

What We Said Then: "Photoshop 3.0 both broadens its range of capabilities and simplifies the work environment in ways that will actually change how you work."

Rating: ★★★★

Photoshop 4.0

Shipped November 1996

Features: Addition of Actions and Adjustments layers, Digimarc technology for "watermarking" images with copyright information.

What We Said Then: "Version 4 is ultimately more logical and more streamlined than its predecessor, which is saying quite a bit. But it comes at a cost."

Rating: ★★★★

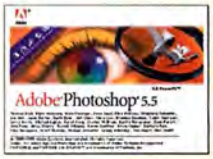
Photoshop 5.0

Announced April 1998

Features: Introduction of undo capabilities, History palette, and Vertical Text and Magnetic Lasso tools.

What We Said Then: "Photoshop has long been the best image editor for the Macintosh, and version 5.0 is the best upgrade to Photoshop by a mile."

Rating: ★★★★★



Photoshop 5.5

Announced June 1999

Features: Many Web tools, including Web-safe color palette; integration of ImageReady 2.0.

What We Said Then: "Photoshop 5.5's extraction tools and minor enhancements add up to a worthwhile package, but they fall short of justifying the price of admission. What gives the update an edge is its Web capabilities."

Rating: ★★★★

Photoshop 6.0

Announced September 2000

Features: Integrated vector drawing tools, new tool bar, expanded Web tool kit, tighter integration with other Adobe programs, enhanced layer management.

What We Say: You'll have to wait.

WEIRD STUFF

iMan for All Seasons

From the country that gave us Arnold Schwarzenegger and the von Trapp family singers comes the latest in iMac accessories—the iMan. Standing 45 inches tall, with a spine made of silver steel, the iMan looks like a droid rejected at the *Star Wars* auditions. Austrian-based iXicom (www.ixicom.com/iman-e.htm) touts its creation as the ideal iMac-presentation stand for Internet cafes, exhibitions, museums, and kiosks. It holds an iMac, a keyboard, and peripherals—while hiding all unsightly cables in its curved backbone. The iMan comes in the six original iMac colors—ruby, sage, snow, and indigo are on the way. And it's yours for just 555 euros (about $500 and change depending on the conversion rate). Sadly, no iMac is included.—ANTON LINECKER

COOL STUFF

Dial I for IP

Pity the telephone, the thick-skulled Neanderthal of the digital world. It plods along on its own isolated branch of the evolutionary tree, without an Ethernet jack or an IP address to call its own. But VoIP, or Voice over Internet Protocol, is about to change all that. VoIP devices such as those from e-tel Corporation (www.e-telcorp.com), IPStarPhone (www.ipstarphone.com), and Super Phone (www.super-phone.com) transform your voice into Internet-compatible data that can be shuttled to any standards-compliant device on the planet—all without phone-company fees or analog circuitry. VoIP phones require a high-bandwidth connection, but that primitive chunk of plastic on your desk is finally ready to step into the modern world.—GREG KNAUSS

PHOTOGRAPH BY KEVIN CANDLAND

CLICK HERE

Everything Old Is New Again

To discriminating Web surfers, something five years old is practically prehistoric. So how has **Zeldman.com** managed to stay as fresh and relevant as the day it was born in May 1995? Credit design guru Jeffrey Zeldman and his keen take on Web trends for making his site a must-read for design pros. Features such as "Ask Dr. Web" and "A List Apart" offer better writing than the typical holier-than-thou design dirges that clog the Web. Not a designer? Sections such as "The Ad Graveyard," devoted to rejected advertisements, will keep you entertained. And Zeldman's collections of icons and pictures can make the look of your desktop as distinctive as the appearance of your Mac. It's proof that some things get better with age—even on the Web.—MATHEW HONAN

More Info:
www.macworld.com/2000/09/how-to/reconcilable.html

Jeffrey Zeldman has plenty to say about Web design, including advice on how to build sites that look good on any platform.

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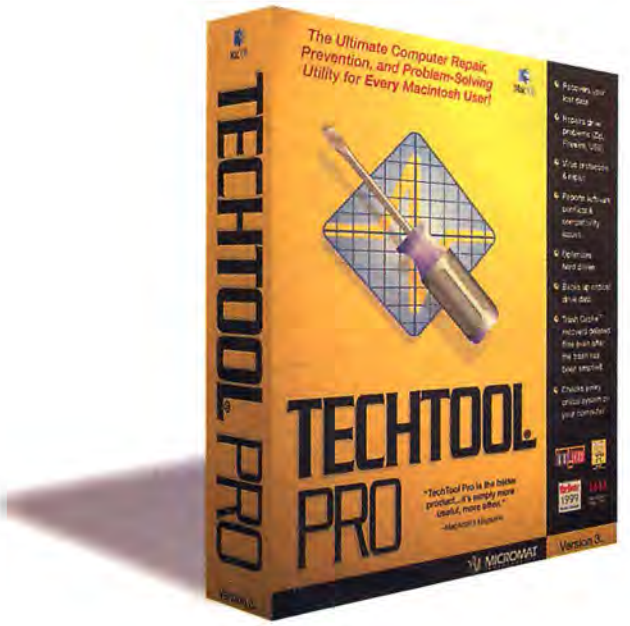

Micromat's disk repair and Macintosh troubleshooting utility just became a whole lot better. Besides repairing drives, recovering data and checking the health of your Macintosh components, TechTool Pro 3 can now help protect you against virus problems and software conflicts. Version 3 also sports a new modern interface. But the real power of TechTool Pro 3 isn't in the features you can see, it's in the features you can't see. Like a multitude of new drive repair routines that can save data that other utilities would simply abandon. An improved recovery system that will find lost files in the darkest caverns of a damaged drive. You'll also find improved performance on key features like disk optimization. Simply put, TechTool Pro 3 is the most complete and powerful troubleshooting utility available for your computer. Why settle for anything less?

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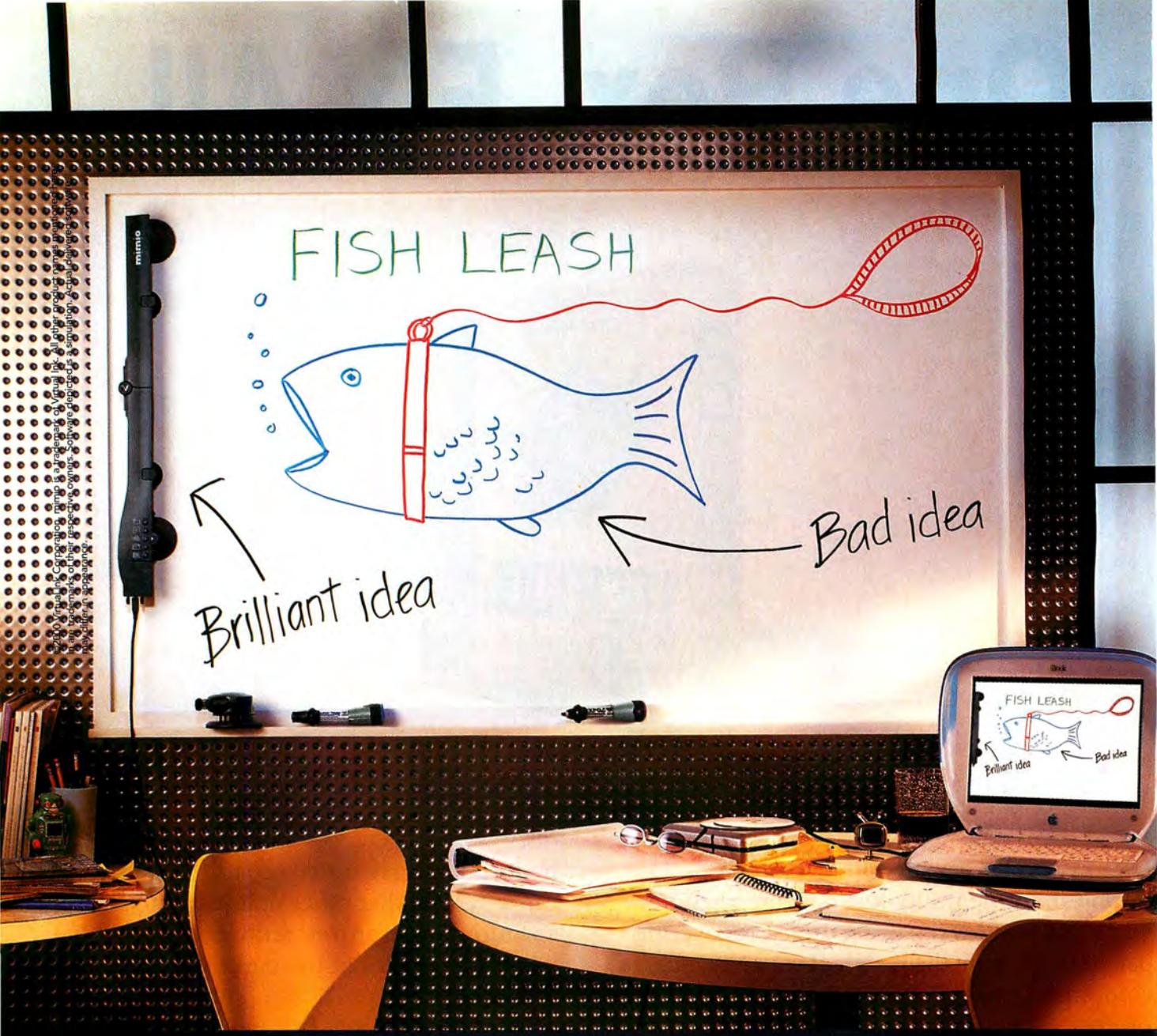

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MACS AT WORK

Out of This World

Guy teaches himself 3-D animation on his Mac. Guy makes animated movie of green, karaoke-singing alien. Guy's animated movie takes the Internet by storm. Guy winds up with a job at Pixar Studios.

You know—that old story.

That's what happened to Victor Navone, a San Francisco–area artist who used his G3 to create *Alien Song,* an abbreviated version of the disco anthem "I Will Survive"—as sung by a three-fingered, one-eyed extraterrestrial named Blit Wizbot.

Navone worked on a 333MHz G3 for many of the 250 hours it took to produce *Alien Song*. Relying on Adobe After Effects for compositing, Navone did most of the texturing work on a Mac so he could take advantage of his Wacom ArtZ ADB tablet (800/922-6613, www.wacom.com). He tapped the Mac version of Hash's Animation Master (360/750-0042, www.hash.com) to create some of the actual animation.

After doing design work for video games, Navone parlayed his *Alien Song* success into a job on the movie *Titan A.E.* He's since moved on to Pixar. Still, the popularity of *Alien Song* puzzles him. "I look at it today and just see the things that aren't perfect and still need tweaking. But people send me e-mails saying they loved *Alien Song,* and it made their children laugh. That's very satisfying."—GREGG WRENN

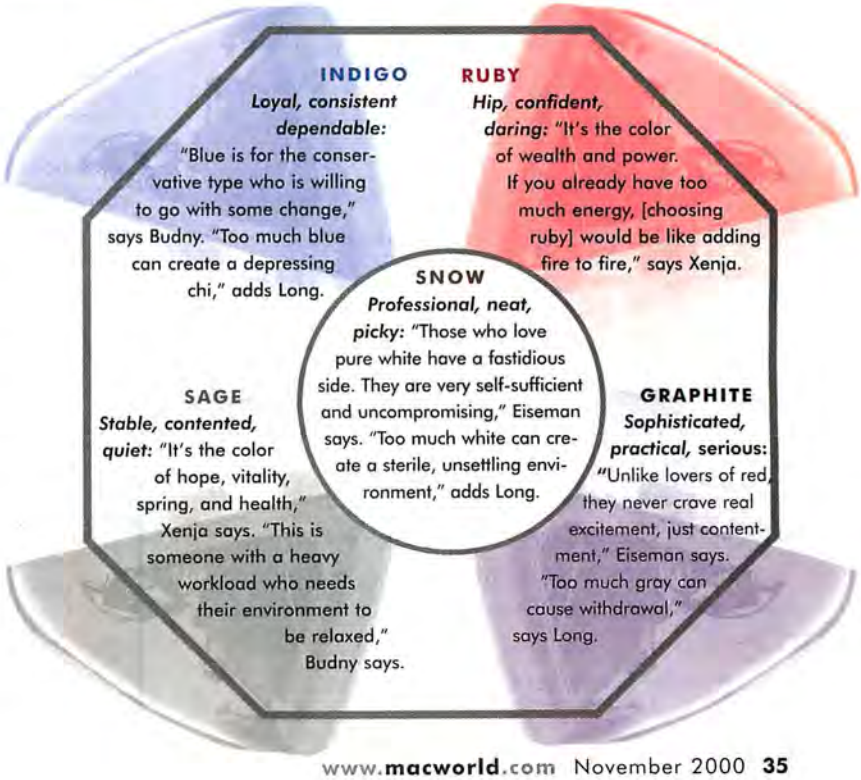
More Info:
http://dwp.bigplanet.com/vnavone

Find out what all the fuss over *Alien Song* is about by visiting Victor Navone's home page.

LINK

DOES THIS iMAC CLASH WITH MY SHIRT?

The Boss here at *Macworld* likes to say that the iMac changed the question "Do I need to buy a computer?" to "What color computer should I buy?". While processor speed and memory size used to be a computer buyer's main concerns, the iMac's latest rainbow of colors has raised a troubling question the average technophile is ill-equipped to tackle: Am I a ruby or an indigo? We've convened a panel of gurus—color psychologist Leatrice Eiseman, Dreamlife.com feng shui expert Seann Xenja, Indianapolis interior designer Ron Budny, feng shui consultant Ailsa Long, and Art Institutes International design instructor Tom Glass—to field tricky color calls. As for processors and memory, that's still our turf.—ADELIA CELLINI



PHOTOGRAPH AT TOP LEFT BY JOHN DE LANCIE

PRO FILE

Direct to Video

It's not often that a movie's camera gets more attention than the actors, but that's what happened on the set of the independent film *Nicolas*. Director Peter A. Shaner shot the movie with an innovative camera system (called the Sony 24P) created by Sony and Panasonic, making *Nicolas* the first U.S. feature to be produced in the 24 frames-per-second (fps) High-Definition TV (HDTV) standard. This camera integrates video, which normally records at 30 fps, with the 24-fps film standard. HDTV is cheaper than shooting on film, and it saves time in the editing process. George Lucas asked Sony and Panasonic to develop the system for the next *Star Wars* installment, but Shaner got to take the camera out for a test spin before it's used on Jar Jar Binks.—NAT SEGALOFF

Q: ***Do you have any sense that you're making HDTV'S*** **The Jazz Singer?**

A: I've said that to the crew to get them motivated, because God knows we're not paying them enough. There are probably things in this movie that, 60 years from now, people will look at and be horrified, because we crossed some line that hadn't even been drawn yet.

Q: ***One of the things that came with Technicolor cameras back in the 1930s was a consultant. What comes with HDTV cameras from Panavision and Sony?***

A: I'm not even sure if there's an instruction manual for this camera yet.

Q: ***Has there been anything that you have not been able to do with HDTV that you were able to do with film?***

A: The only thing that we can't do, so far, is any kind of true slow motion. When you over-crank a camera and run it at 60, 75, or 100 fps and play it back at 24 fps you get a true slow motion. This camera will not do anything except 24, 25, or 30 fps, so you don't get a true slow motion with it.

Q: ***What are the first differences you noticed between this and 35mm?***

A: It took a while to get into the groove of knowing what we were going to do with the camera. Then there's having the HDTV monitor on the set, which is a huge plus. The other thing is, tape is cheap. On a film set, when you yell "Cut," something I call "the bomb burst" happens: everyone who has been very focused and quiet all during the take, scatters. It seems to take five minutes to corral everybody back into doing another take. But on this, I'll roll the tape and sometimes even have discussions with the actors while the tape is rolling—because everybody is so focused.

Buzz continues on page 40

More Info:
www.macworld.com/2000/08/14/nicolas.html

Go behind the scenes of *Nicolas* and find out how the Sony-Panavision high-definition camera could change the way movies are made.

LINK

PAYING THE PIPER?

The Recording Industry Association of America (RIAA) says services such as Napster—which lets you download MP3 files from other users' hard drives—hurt record sales. But should the RIAA be singing the blues? A Jupiter Communications survey of 2,258 online-music fans found that Napster users are 45 percent more likely to increase their music purchases. Still, don't expect that figure to change the music industry's tune about Napster.

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What's HOT

A QUICK LOOK AT THE WORLD OF TECH

1. **Cobalt Networks threatens to sue Apple over new G4's cube shape.** *Jittery Professor Rubik retains legal counsel "just in case."*
2. **Apple blows away critics by meeting deadline for releasing OS X beta.** *If OS X beta isn't out when you read this, please delete everything between "blows" and "deadline."*
3. **Publishing world convenes at Seybold conference in San Francisco.** *Highlights include Steve Jobs keynote, Adobe-Quark steel-cage match.*
4. **Adobe Photoshop 6 ships.** *"Now we can doctor photos more convincingly," exult tabloid publishers.*
5. **Apple ranked No. 36 in World's Most Valuable Brand survey.** *But it's sure to move up after Mickey Mouse (No. 8), Nike Swoosh (No. 30) found in illicit tryst.*

Product WATCH

RELEASED

- Multifunction peripherals from Hewlett-Packard (800/552-8500, www.hp.com): The $499 **OfficeJet G55** and $799 **OfficeJet G85** should ship in November. Both MFPs include an integrated 36-bit, 600-dpi flatbed scanner and printing engine. The G85 doubles as a stand-alone color fax machine.
- A DV camera from iRez (480/922-0044, www.irez.com): The **KritterDigital** can process uncompressed digital video on any FireWire-enabled Mac. The FireWire-based companion to iRez's **Kritter USB** cameras sells for $200.

ANNOUNCED

- A lawsuit by Apple (800/692-7753, www.apple.com): The computer maker is suing anonymous Web posters whom it accuses of violating trade secrets. Apple charges that the defendants posted pictures of products such as the dual-processor **Power Mac G4** and the **Apple Pro Mouse** on the Internet before they were announced.
- A preview version of **Netscape 6** (650/254-1900, http://home.netscape.com): The second preview edition of Netscape 6 includes skins to customize the interface, new sidebar tabs, and support for multiple e-mail accounts.

UPDATED

- **Quicken** by Intuit (800/446-8848, www.intuit.com): **Quicken 2001 Deluxe** features simplified searches, new reminders and alerts, more online banking options, and tighter integration with the Quicken.com Web site. The software sells for $60, with a $20 rebate for Quicken users who upgrade.
- **Flash** by Macromedia (800/457-1774, www.macromedia.com): **Flash 5** sports a redesigned interface that will appear in other Macromedia Web applications. Flash users can upgrade for $149. The vector animation tool sells for $399.
- **Eudora** by Qualcomm (800/238-3672, www.eudora.com): **Eudora 5** adds e-mail usage statistics and a sharing protocol for groups of users. The free version of the e-mail client contains banner ads, while the ad-free version sells for $40.

—Compiled by PHILIP MICHAELS

ILLUSTRATIONS BY MARK MATCHO

IN THE CHIPS

GRAPHIC CHANGES AWAIT YOUR MAC

When it comes to graphics chips, Apple and ATI have been running mates for some time. Now several companies are trying to usurp ATI's place at Apple's side.

But it's always hard to unseat an incumbent. ATI cards sit in new Macs' only AGP slot; many cards that also use the AGP interface won't work unless users remove the installed ATI card.

- ATI (905/882-2600, www.ati.com) offers the $279 Radeon chip. The AGP version should be out by early October, with a PCI card to follow later in the fall. The Radeon has 32MB of DRAM, carries VGA and DVI connectors, and supports Apple DVD Player.
- 3dfx (888/367-3339, www.3dfx.com) has already debuted its dual-chip Voodoo5 5000 and will focus now on delivering its lower-cost, single-chip Voodoo4 4500 to customers. The cards are come only in PCI versions.
- Formac (925/251-0100, www.formac.com) has slated its ProFormance 4 for release later this year. You can configure the card so the two chips work in tandem or split them apart to drive separate displays.
- Appian's (800/727-7426, www.appian.com) $749 Jeronimo 2000 AGP-only graphics card features two VGA ports and 32MB of video RAM, 16MB per display.
- Nvidia (408/615-2500, www.nvidia.com) says it will release a Mac version of its GeForce2 MX AGP card sometime next year.—JEFFY K. MILSTEAD

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X Arrives

Mac users, take note: as of September 13, 2000, the next-generation OS has landed. Sort of. Apple may not be finished yet, but it's taken its first big step with the public release of an early version of Mac OS X.

This is a "public beta," meaning that Apple is letting us get our hands on a version of Mac OS X that's definitely not fully formed.

So what does Apple gain by releasing this early version of Mac OS X? The release offers tangible proof to all Mac users that the company is working toward a stable, modern operating system. But perhaps most importantly, Apple also gets the Mac's most serious, hard-core users to put OS X to the test *before* it's officially released. Apple has created a detailed Web site where beta users can leave their feedback. Presumably, the OS X team will use this information to iron out the kinks before the new operating system's final release in early 2001.

The Mac OS X beta costs $30 and can be purchased only via the Apple Store (http://store.apple.com). The public beta will stop working on May 15, 2001, and Apple says it currently has no plans to offer owners of the public beta any discount toward purchasing the final version of Mac OS X.

Who Can Try It

If you don't have a Mac that shipped with a G3 or G4 processor inside, your chances of using the Mac OS X beta are not very good. Apple says Mac OS X supports only Power Mac G3s

Inside X

The most visible new feature of Mac OS X is the Dock, which brings together Mac OS 9's Application menu and Launcher file utility, with a dash of Windows' Taskbar.

Music Player is Mac OS X's combination CD and MP3 player.

(beige and blue models), Power Mac G4s, iMacs, iBooks, and *black* PowerBook G3s. The company also recommends a minimum of 128MB of RAM.

If you're planning on using Mac OS X's Classic mode, which allows you to run Mac OS 9 applications, you also need to own a copy of Mac OS 9. OS X's predecessor isn't included in the beta package.

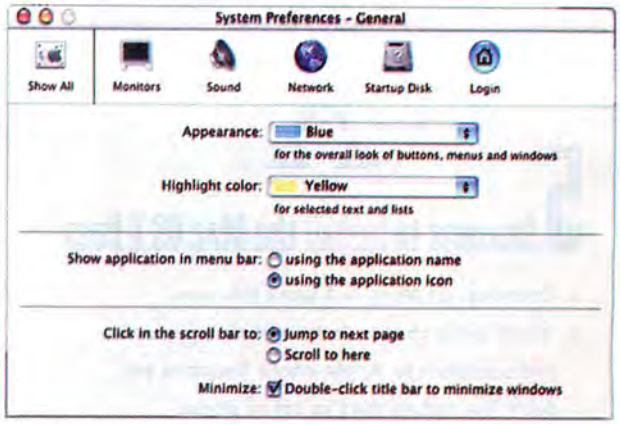
The good news is that the Mac OS X installation procedure is very straightforward. You will not need to cross your fingers as you erase the previous operating system from your primary machine. When you install the public beta on the same hard drive as your existing Mac OS 9 system, a new control panel named System Disk will appear. It lets you switch back and forth between OS 9 and OS X at will. As a result, giving Mac OS X a test drive is much less traumatic (and much easier to back out of) than previous Mac OS upgrades.

What's in There

Once you install the beta, OS X will radically transform your Mac. It's a completely new operating system, not merely an impressive revision of the existing Mac OS. That much is clear the first time you boot up the system: you must type in your user name and a password.

Once you get to the desktop, you'll find that it's a radically different place. At the bottom of the screen is a row of icons called the Dock. If you're familiar with Microsoft Windows, your first reaction will probably be one of recognition—the Dock looks similar to Windows' Taskbar, and all minimized windows appear there (see "Inside X").

The Finder is also different yet familiar. There are icons sitting in a window, but by default that window has a Web browser–style tool bar, a back button, and a pop-up list that shows you where your current folder stands in the file hierarchy. If you like, you can view your drive's contents in a new multicolumn



Mac OS X replaces the Control Panels folder with the new **System Preferences** application, which lets you customize your operating system settings within a multipaned interface.

> "We've held this in our hands for a long time. Starting today, we want you to have it in yours."
>
> —Apple CEO Steve Jobs, speaking about Mac OS X at Apple Expo Paris

Apple has created an OS X–native version of the QuickTime player and replaced Apple CD Audio Player with a new combination CD and MP3 Player (quirks: no ID3 tag support and inability to look up CD track info via the Internet's CDDB database).

Items to the left of this line are applications; items to the right aren't. You can also click on this line and drag it up or down to make the dock larger or smaller.

Any document you drag to the Dock appears down here, as do any windows you minimize by clicking on the yellow button with the minus symbol in it.

Although Oscar the Grouch would be mortified, this wire basket is the new Mac OS's Trash Can.

Instead of a Control Panels folder, Mac OS X offers an application called System Preferences, from which you can control various aspects of Mac OS X's behavior.

Classic is a Mac OS X application that runs Mac OS 9 inside it. Once Classic is running, you can run Mac OS 9 applications inside Mac OS X.

This icon represents a Web link; click on it, and you'll be sent to a Web page.

5 Reasons to Install the Mac OS X Beta

1. One day, all Macs will work this way.
2. You'll get a chance to try out new features and complain to Apple about the ones you don't like *before* they're set in stone.
3. It's easy to switch back and forth between Mac OS 9 and Mac OS X, so you can always just return to OS 9.
4. You'll get to try out a slew of new Mac OS X–native applications that will be in beta testing at the same time as Mac OS X.
5. PowerBook users will marvel at how quickly Mac OS X wakes up from sleep—in only a few seconds.

5 Reasons to Avoid the Mac OS X Beta

1. It's a beta. Parts of it aren't going to work right, some features aren't working at all (AirPort, for one), and there's always a chance it could do something to your data.
2. You have to pay $30 for software that's unfinished and expires next May. Apple may not even let you apply that money toward the purchase of the final version of Mac OS X.
3. Classic mode allows you to run all your Mac OS 9 applications, but in practice it's a bit unstable. You'll probably need to switch back to Mac OS 9 whenever you need to do a lot of heavy work in a Classic application.
4. Most applications are not Mac OS X native, and most of the extensions and utilities you use to enhance and personalize your Mac aren't there yet, either.
5. Got something other than an original G3 or G4 Mac? Got one of the original PowerBook G3s? Well, forget it. Mac OS X isn't made to work with your system at all.

From its high-quality icons to its multicolumn Browser view, the new **Finder** lets you know that you're not in Mac OS 9 anymore.

Browser view. Also, your hard drive icon appears not on the desktop but at the "Computer" level of the Finder.

Text and icons are also very different. Icons can be much larger than they can in Mac OS 9, and you can change their size via a slider. Text everywhere is antialiased, with smooth edges that make it much easier to read.

Classic Compatibility

Few applications have OS X versions yet, so for most Mac users, the most important Mac OS X program is Classic, the program that provides compatibility with Mac OS 9 applications. Once Classic is up and running (it loads automatically when you launch any Mac OS 9 application), it acts as a virtual Mac OS 9. Classic is a remarkable achievement, but its implementation can be confusing.

What's Missing

Some important items aren't working in the Mac OS X public beta, and if you rely on them, you're out of luck. AirPort does not work with this beta. Classic applications can't print to USB printers. You can't boot Mac OS X off of a FireWire drive, and many peripherals won't work until their manufacturers release new, Mac OS X–compatible driver software. You can't mount any AppleTalk-based file servers—only ones that use TCP-IP based file sharing.

But of course things aren't working fully in Mac OS X right now. That's why they call it a *beta*. It may not work quite right, and it may have its share of bugs, but Mac OS X is the future of the Mac. And, finally, that future has arrived.—JASON SNELL

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

Special Report: Get the latest information about Mac OS X and discuss it with other Mac users.

LINK

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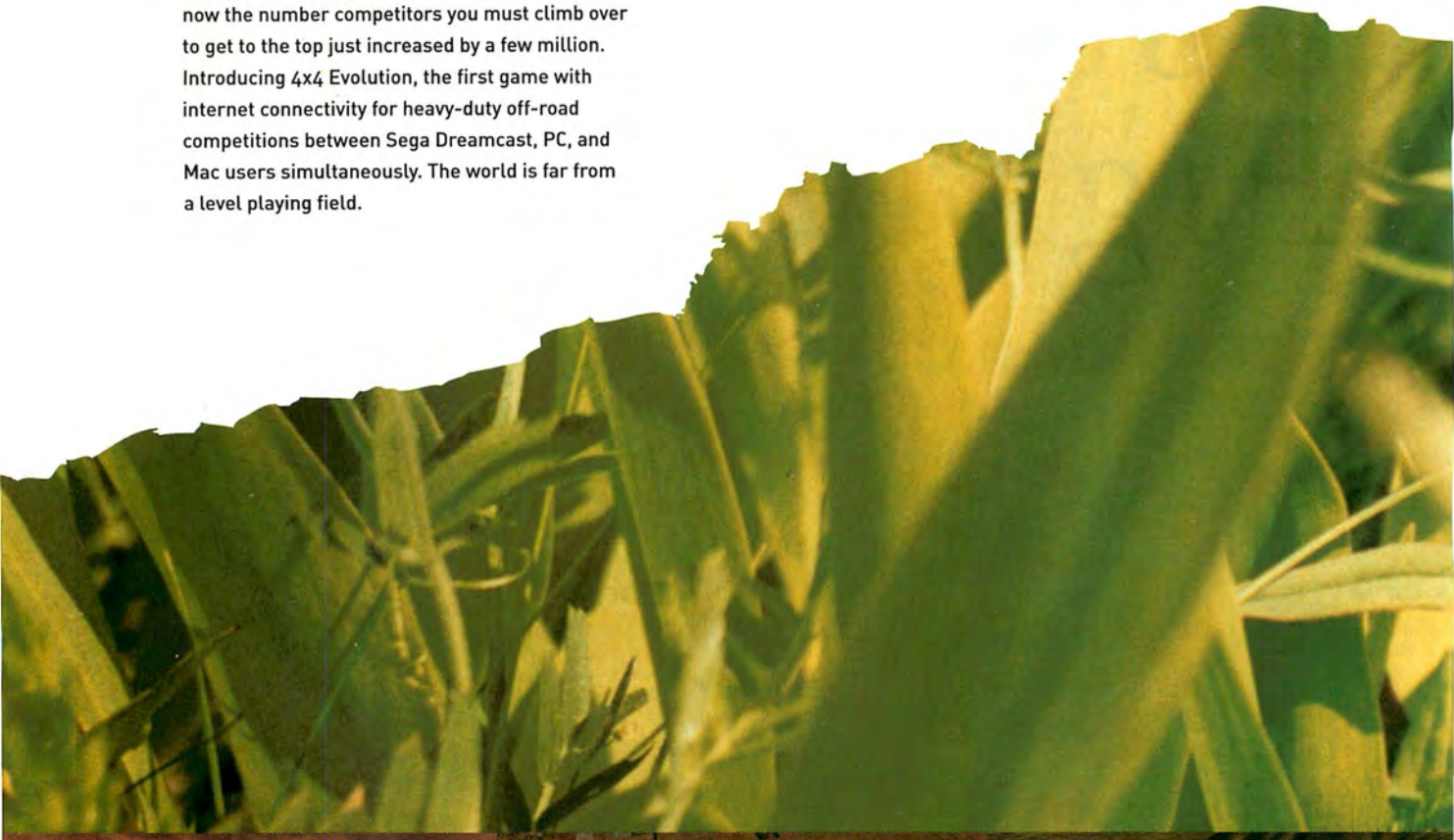

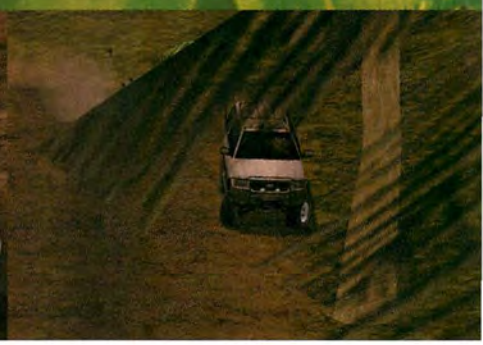

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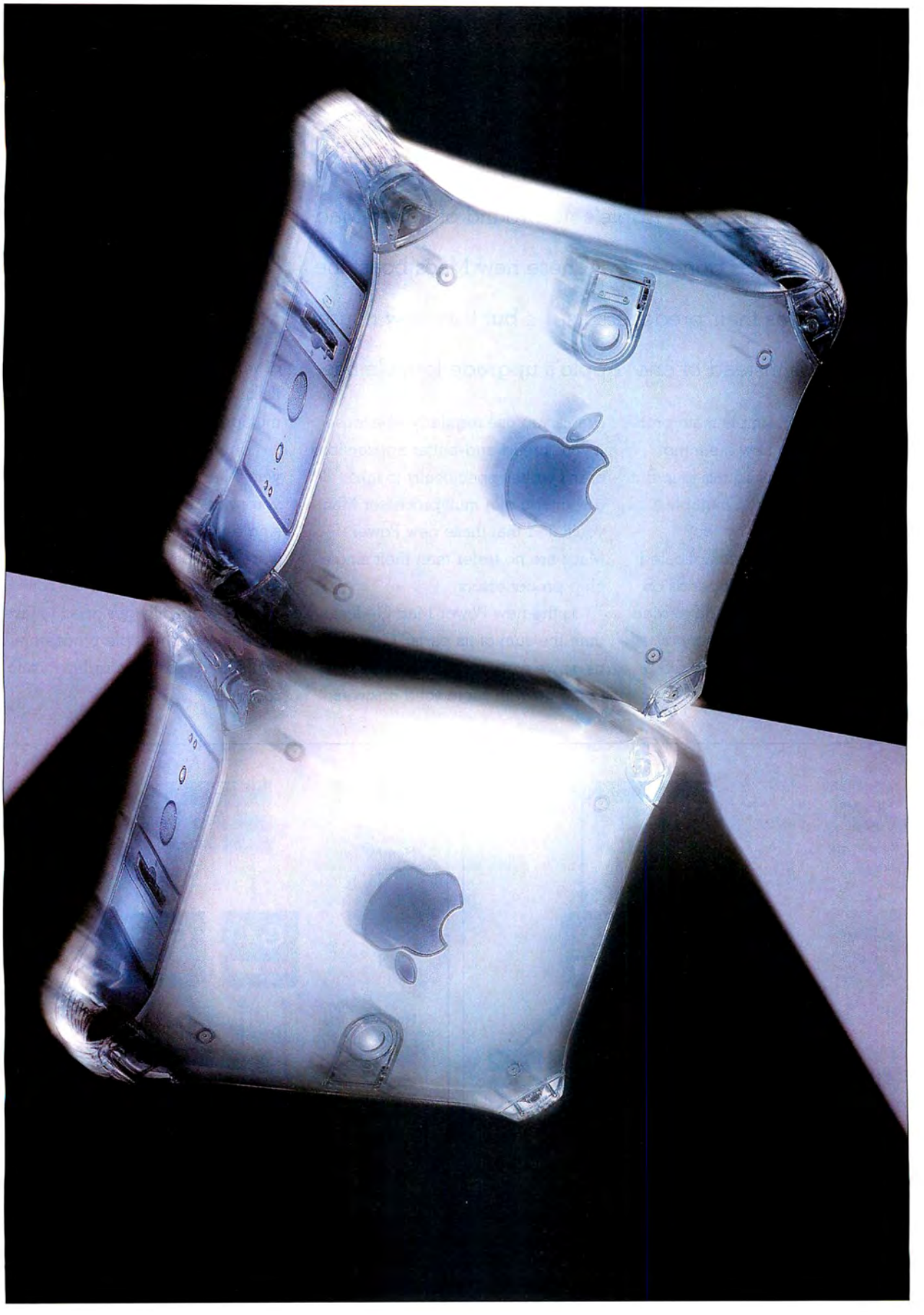
WHEN IT COMES TO THE **NEXT GENERATION** OF **POWER MACS,**
ARE **TWO PROCESSORS** REALLY **BETTER THAN ONE?**

DOUBLE VISION

BY
STEPHAN
SOMOGYI

PHOTOGRAPHY BY MARK JOHANN



There are a few things we Mac users take for granted. As sure as two plus two equals four, new Power Macs from Apple will come with faster processors and (if we're really lucky) entirely new processor designs.

But with the release of Apple's new round of Power Mac G4s, our world has gone askew. These new Macs boast the same speeds as their predecessors . . . but they now house two G4 chips instead of one. Apple's upgrade formula has changed, and even simple math problems have taken on new meaning. Sure, two plus two still equals four. But what happens when you multiply a 500MHz G4 processor by two?

The answer is more complicated than you might think. It depends on whether you plan to upgrade to Mac OS X, which will use that second processor far better than Mac OS 9 ever will. And it depends on the programs you use regularly—because if your bread-and-butter applications aren't written specifically to take advantage of a multiprocessor Mac, you'll find that these new Power Macs are no faster than their single-chip predecessors.

Is the new Power Mac G4 less than the sum of its parts? Come with us as we work the problem and come up with some solid answers.

Multiprocessor Math

This isn't the first Mac with more than one processor to come from Apple. Back in 1996, Apple introduced the dual-processor Power Mac 9500 MP. But since then, we've been without multiprocessor Macs. That's because the G3 processor that supplanted the 604 didn't work well in multiple-processor systems. During the G3 era, Apple put multiprocessing on hold.

How things have changed. Today's G4 processor is fully capable of working in tandem with others of its kind, allowing Apple back into the multiprocessor game.

But having two processors inside your Mac doesn't automatically grant you twice the performance of a single-processor machine. The hardware alone isn't enough: both the applications and the system software must be explicitly designed to take advantage of multiple processors. If you spend most of your time using

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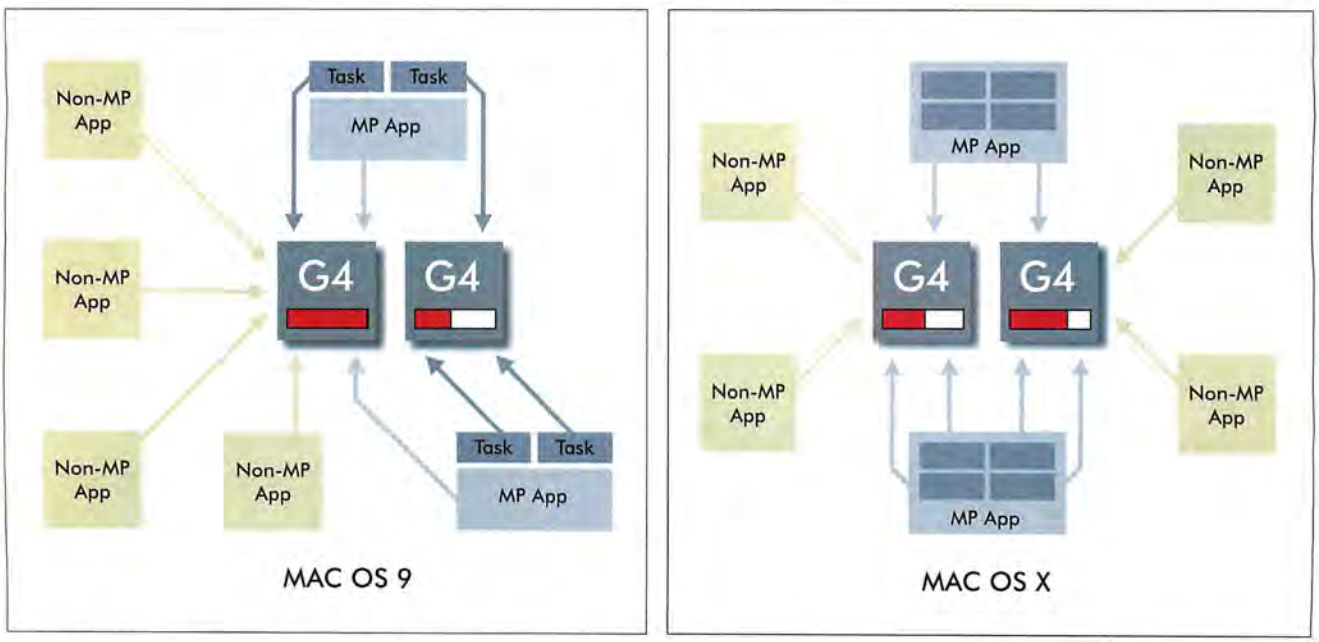

G4 Sharing: How Multiprocessing Works In Mac OS 9 (left), most applications run on the primary processor, which bears the bulk of the processing load (signified by the red indicator bar). Applications that are multiprocessor-savvy can spin off additional tasks to the second G4 chip, providing a bit of a speed increase. In Mac OS X (right), non-multiprocessor applications can run on either processor—evening out the work the two processors must do. Multiprocessor-savvy software runs its various tasks on either processor—the operating system's scheduling software will give the job to the processor doing less work at any given time.

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applications that don't support multiprocessing, you won't see much immediate benefit from the second processor in your Mac.

The Traffic Cop In any computer, the operating system doles out processor power. To that end, the OS contains a piece of software called a *scheduler,* which determines how much processor time your software—including applications and many of the OS's components—can use at any one time. In multiprocessor machines, the scheduler also determines which processor performs specific tasks.

Critics of the Mac operating system have long cited its lack of *preemptive multitasking,* a system that gives the operating system complete control over which tasks get processor priority. (Mac OS X will offer this feature.) In contrast, since the days of MultiFinder the Mac has used *cooperative multitasking,* a sort of honor system that allows any program to use the processor until it's ready to let go. That means a misbehaving task can hog the processor, causing all the other programs to slow to a halt.

Although the core of the current Mac OS doesn't do preemptive multitasking, you can find this feature . . . if you know where to look. It's tucked away in Apple's multiprocessing software, built into Mac OS since version 8.6 (and seriously updated in Mac OS 9, paving the way for these new multiprocessor Macs). This component holds the key to making dual-G4 Macs work with today's Mac OS until Mac OS X becomes available.

Today's Multiprocessing Problems

Apple didn't create multiprocessing on the Mac; that honor goes to now-defunct DayStar Digital, which developed system software to enable its own multiprocessor hardware. DayStar's software add-on, nPower, let apps use multiple PowerPC processors, residing on DayStar's hardware, as application-specific accelerators. This concept gained enough popularity that Apple adopted it.

PLENTY OF APPLICATIONS DO CRY OUT FOR SHEER NUMBER-CRUNCHING, PROCESSOR-BASED PERFORMANCE: MPEG ENCODERS, IMAGE PROCESSORS, 3-D RENDERERS, AND THE LIKE.

Since Apple didn't design the classic Mac OS to do its work on multiple processors, it can't take advantage of them. The only beneficiaries of additional processors are pieces of software that take advantage of the preemptive scheduling in Apple's multiprocessing software.

Going It Solo Programs (such as the Finder) not designed to that specification can't use the second processor at all, and some types of programs wouldn't really benefit much from multiprocessing anyway. The speed of your hard drive limits disk-repair utilities, for example, and network speeds, as well as the drive, limit file transfers.

But plenty of apps *do* cry out for sheer number-crunching, processor-based performance: MPEG encoders, image processors, 3-D renderers, and the like. These programs—Casady & Greene's SoundJam MP, Adobe Photoshop, and Maxon's Cinema 4D XL, to name three—are most likely to benefit from multiprocessing technology (as well as other performance-boosting systems, such as the Velocity Engine subprocessor on the G4 chip). (For a list of MP-capable apps, see the table "MP-Savvy Software.")

The current incarnation of Mac OS supports *asymmetrical multiprocessing,* a system in which the OS and most apps run on a single processor while a few specific apps take advantage of other available processors. The term describes the imbalance of the load on various processors: in this configuration, the second processor often remains idle instead of speeding your Mac up (see "G4 Sharing: How Multiprocessing Works").

Factor of Ten

When Mac OS X arrives, today's dual-processor G4s will really come into their own, because Mac OS X supports *symmetrical multiprocessing.* This means it treats the available pro-

continues

MP-SAVVY SOFTWARE

Here's a list of some of the Mac applications that currently take advantage of multiprocessing in Power Macs:

PRODUCT	COMPANY
Final Cut Pro	Apple
After Effects	Adobe
Photoshop	Adobe
Premiere	Adobe
SoundJam MP	Casady & Greene
MPEG Power	Heuris
Lightwave 6	NewTek
Media 100	Media 100
Cinema 4D XL	Maxon
Media Cleaner Pro	Terran Interactive

Review

Power Mac G4/450 Dual Processor and Power Mac G4/500 Dual Processor

Two-Processor Macs Are Polished—but Not Twice As Fast

POWER MAC G4/450 DUAL PROCESSOR

Rating: ♦♦♦♦

Pros: Stable; fast.

Cons: Mac OS 9 doesn't natively support second processor.

List price: $2,499

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

POWER MAC G4/500 DUAL PROCESSOR

Rating: ♦♦♦♦

Pros: Stable; fast; generous amounts of RAM.

Cons: Mac OS 9 doesn't natively support second processor; relatively expensive.

List price: $3,499

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

MACWORLD'S BUYING ADVICE:

The new Power Macs are stable, speedy machines based on a time-tested design. They won't fully utilize the second processor, however, until Mac OS X is available—unless you use one of the handful of multiprocessing-enabled applications. The other improvements to the systems—a new mouse and keyboard, plus gigabit Ethernet—are incremental but welcome. The Power Mac G4/500 Dual Processor is a faster computer, but you'll pay a premium for a relatively small improvement.

SCOTT PETERSON

Are two heads really better than one? In the case of Apple's new multiprocessor Power Mac G4 systems, the answer is a definite maybe. Although some applications do currently use two processors, don't expect these dual-processor computers to perform twice as fast as previous G4s.

These systems offer a new wrinkle with truly exciting potential: gigabit Ethernet—the Ethernet port on these new systems now supports 10BaseT, 100BaseT, and 1000BaseT over copper cable. However, at $700 a port, 1000BaseT switches are prohibitively expensive for most schools and offices and rarely perform at more than twice the speed of 100BaseT.

The new G4s and the G4 Cube are the first models to include the Apple Display Connector (ADC), Apple's modified DVI (Digital Visual Interface) connector, which adds power and a USB signal to the monitor cable. But fear not—the G4's built-in ATI Rage 128 card also has a standard VGA connector, so you won't need to spring for a new monitor.

How Fast Is Fast? Until all of Mac OS supports multiprocessing, users won't see a speed improvement when they run applications not specifically written for multiple processors. Mac OS 9 does not support this sort

continues

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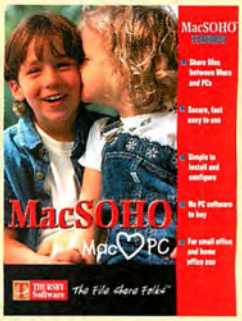

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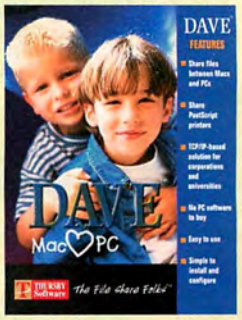

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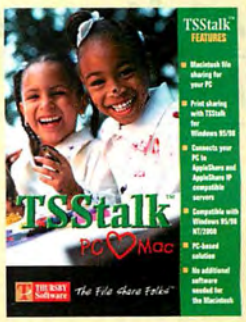

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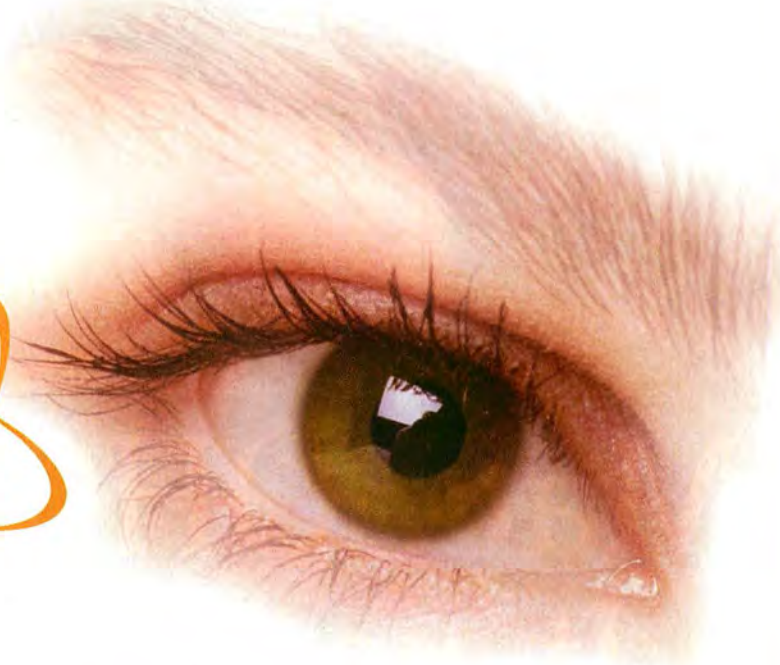

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Dual-Processor Power Mac G4s

Macworld LAB TEST

Reference systems in italics. **Best results in bold.** Shorter is better. Longer is better.	SPEEDMARK 2.1	PHOTOSHOP 5.5				CINEMA 4D XL 6.1	SOUNDJAM 2.1.1
		Gaussian Blur 10	Unsharp Mask 2.3	RGB to CMYK	Lighting Effects	Model Render 640×480	MP3 Encode
Power Mac G4/450 DP	158	4.7	5.1	20.5	5.0	7:54	1:14
Power Mac G4/500 DP	**165**	**4.1**	**4.9**	**18.5**	**4.7**	**7:04**	**1:06**
Power Mac G4/450	*146*	*7.1*	*7.7*	*21.0*	*7.8*	*15:43*	*2:10*
Power Mac G4/500	*159*	*6.5*	*7.4*	*18.9*	*6.8*	*13:46*	*1:38*
	Better ▶	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better

Speedmark 2.1 scores are relative to those of an iMac 350MHz, which is assigned a score of 100 for each test. Photoshop results are in seconds. Cinema 4D XL and SoundJam results are in minutes:seconds. We tested each system with Mac OS 9.0.4, a default system disk cache, and Virtual Memory disabled for all application tests. We set displays to 1024-by-768-pixel resolution and 24-bit color. We performed Speedmark testing with original memory configurations: 128MB of RAM for the 450MHz systems and 256MB for the 500MHz systems. For Photoshop testing, we used 256MB in all systems. For Photoshop tasks, we used a 50MB file. We set Photoshop's memory partition to 150MB and History to Minimum. We allocated 80MB of memory to Cinema 4D XL. We rendered a model at a resolution of 680 by 480 pixels with oversampling set to 4 by 4. For our MP3 encoding test, we used an audio-CD track that was 9 minutes and 25 seconds in length and converted it using default settings of 128 Kbps in SoundJam 2.1.1. For more information on Speedmark, visit www.macworld.com/speedmark.—Macworld Lab testing supervised by Gil Loyola

of multiprocessing (symmetrical), but Mac OS X will. Even when the operating system does offer proper multiprocessor support, not every action doubles in speed; your Mac's hard drive, graphics card, and interface buses can still create bottlenecks.

When performing everyday activities such as booting the computer, encrypting a file, and performing an Excel calculation—parts of our new Speedmark test suite—the dual-processor systems performed the same as older, single-processor systems with the same clock speeds.

More surprisingly, we discovered a conflict between iMovie and the operating system's multiprocessor software; Apple has released a 2.0.1 update, which is available at www.apple.com/imovie. (As a result of the problem with iMovie, we updated Speedmark to version 2.1, which features tests with iMovie 2.0.1.) What is clear from our tests is that multiprocessor-enabled applications such as Photoshop, SoundJam, and Cinema 4D XL are remarkably fast—although not quite twice as fast—when compared with the same apps running on single-processor Power Macs.

Polish the Apple Multiprocessing aside, the new Power Macs also include the recently refined optical Apple Pro Mouse (4 mice; *Reviews,* October 2000), iMovie 2 (4½ mice; *Reviews,* October 2000), and new Apple Pro Keyboard (3½ mice; *Reviews,* elsewhere in this issue).

With this new keyboard, Apple came up with a fix for a USB-related problem—namely, that a keyboard's power button works only if plugged directly into the computer, and not connected via a USB hub. Apple's peculiar solution: take the power button off the keyboard altogether. Now you'll find the power button on the Apple ADC monitors—you can force a reboot by pushing command, control, and the monitor's power button (or the power button on the front of the Mac). Pushing the power button alone simply puts these systems to sleep.

The Power Mac G4/500 comes standard with a DVD-RAM drive that can use the newest 4.7GB DVD-RAM media. This drive is also available as an add-on to the Power Mac G4/450 for an additional $300.

Final Verdict In shipping multiprocessor Macs before it has shipped an operating system that can truly utilize it, Apple has put the cart before the horse, but it's a pretty nice cart. The new Power Macs are stable, fast computers, even if you can't yet take full advantage of the second processor.

Luckily, Apple isn't charging extra for these premature features—the new systems cost the same amount as the old ones. If you've been wanting to buy a high-end system with PC slots for expansion and room for additional drives, the Power Mac G4/450 Dual Processor is a good value that will offer dividends when Mac OS X arrives. The Power Mac G4/500 Dual Processor is a faster computer, but you'll pay a hefty price for a relatively small improvement.—KRISTINA DE NIKE

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cessors equally, balancing the load of your system over the whole array.

By virtue of its internal design, Mac OS X is natively multiprocessor-aware, and all of its functions can run on multiple processors, unlike those of the classic Mac OS. In day-to-day use, multiprocessor machines running Mac OS X should feel snappier than single-processor machines.

Applications written to Apple's Carbon specification will appear in the new Aqua theme, and should offer much better stability (thanks to Mac OS X's new protected-memory model, which prevents a crashing app from bringing down your system). Carbon apps will also take advantage of multiprocessing in ways that current Mac OS applications can't.

Those Carbon apps specifically written to take advantage of multiprocessing will have complete access to the processors. The OS can assign each individual task these apps undertake to a different processor, balancing the load and using processor power as efficiently as possible.

MP Loophole But even if a Mac OS X program wasn't written with multiprocessing in mind, it will benefit. The operating system can still assign different programs to *different processors*, meaning that program A can run on one G4 while program B toils away on the other. In addition, programs don't work in a vacuum—they're always working in conjunction with the operating system. And since Mac OS X will be multiprocessor-savvy, it will balance all of its own work (such as moving windows and scrolling) across processors.

Apple says multiprocessor-savvy Mac OS 9 programs will still be able to take advantage of multiprocessing when running in OS X's Classic compatibility environment. This means any of today's multiprocessing apps that don't attain Mac OS X–native status in time won't have to give up their multiprocessing abilities—they can use Classic mode.

Finding the Answer

If you're wondering whether you need a multiprocessor Mac today, it's a simple decision. If you primarily use apps that support multiprocessing, there's no reason not to buy a multiprocessor Mac. But if your most-used apps aren't constrained by the processor, you don't really need a multiprocessor machine. In fact, you won't see any benefit from multiple processors until Mac OS X ships.

Multiprocessing is already quite commonplace on other hardware and OS platforms. Linux, for example, supports symmetrical multiprocessing. Apple's new dual-processor machines should provide a perfect platform for PowerPC-based Linux systems, offering many of the server features we're looking forward to in Mac OS X, well in advance of its arrival.

Once Mac OS X hits the scene, multiprocessing will open up areas where the Mac previously couldn't compete. Many server-based Web applications are very processor-intensive, and the availability of multiple processors in a single Web-server machine will make those apps respond much faster.

It's also possible that new applications for graphics, 3-D, and video will appear, using Mac OS X and multiprocessor systems as a platform. Apple's future hardware-and-software one-two punch will make the Mac a much more viable platform for hard-core, processor-intensive applications.

The Last Word

These days, Intel and its competitors are releasing chips with speeds measured in *gigahertz*, not megahertz. The clock speed of the PowerPC has lagged behind, and though Apple and Motorola are loath to admit it, these dual-processor Power Macs were created most likely because faster G4 chips just weren't ready.

THOUGH APPLE AND MOTOROLA ARE LOATH TO ADMIT IT, THESE DUAL-PROCESSOR POWER MACS MOST LIKELY EXIST BECAUSE COMPARABLY FAST PROCESSORS BEARING A POWERPC BRAND JUST AREN'T READY.

Still, adding second processors to the Power Mac line is a way for Apple to boost speeds without cranking up the megahertz—and if you're using a multiprocessor-enabled application, you'll get major speed boosts from this pair of chips. Otherwise, these new Power Macs won't run much faster than their predecessors . . . until Mac OS X arrives, that is. Once that happens, the power of the dual-processor Power Mac G4 will multiply, and Apple's multiprocessor math should finally add up. **m**

Contributing Editor STEPHAN SOMOGYI has written about Macs and their processors for years. His processor-to-computer ratio remains 1:1.

Kill Your MODEM

No Matter Where You Live, Now There's High-Speed Internet Access for You

Your neighbors have done it. Your friends have done it. Even your grandfather has done it—they've killed their modems for a zippy, high-speed, always-on Internet connection. With his newfound bandwidth, Grandpa is suddenly a world-class netizen—downloading MP3s, checking stock quotes in real time, bidding on Lionel trains on eBay, and serving up his own Web site, all from his home iMac.

You, on the other hand, are enduring busy signals, dropped connections, missed phone calls, and slow-as-molasses Web response time. Life just isn't fair.

by MEL BECKMAN

But it's getting fairer. The fastest analog modems, with peak download speeds of 56 Kbps (thousands of bits per second), can hardly be compared with the speeds of digital Internet connections, which have speeds ranging from 128 Kbps to 10 Mbps (that's *M* as in *mega*, or millions of bits per second). The fastest of the fast is as much as 200 times faster than an analog modem.

Today you'll find fast Internet links over DSL (Digital Subscriber Line), ISDN (Integrated Services Digital Network), satellite, and TV cable widely available—quite likely in your area. Each high-speed technology has pros and cons, however, and you probably won't find all services available where you live—but new worlds of content and capability make these technologies worth looking into.

Understanding how cable, DSL, ISDN, and satellite services work will help you pick the technology that best suits your location, your needs, and your budget. (See the chart "Finding a Fat Pipe" for a list of national providers.)

● Illustrations by RICK SEALOCK

The Basics

When it comes to high-speed Internet access, there are two important things you'll need to ask yourself: what options are available to me, and how much speed do I need?

Location, Location, Location As with other trappings of civilization, city dwellers have a wider range of options than country folk. (But even the remotest areas typically have access to at least one high-speed Internet technology.) Being an urbanite won't solve all your problems, however. Though you might live in a high-tech mecca, your exact location may limit the availability of some services, even if they are offered in your city.

Speeding Along Knowing which technologies are available leads to another issue: speed. Your bandwidth requirements will vary depending on what you want out of your Internet connection. If you're going to be running a small Web server on your G4 or plan to download tons of large files, having higher speeds is essential.

Unlike traditional T1 dedicated-Internet connections that are used by businesses (and that cost upward of $1,000 per month), most home technologies don't carry any speed guarantees. Currently, high-speed services are "overcommitted"—many more users are signed up to use a given Internet pipe than do so simultaneously. Providers commonly run at an overcommitment ratio of 100:1, expecting that only a fraction of users will be active at any one time. But during peak traffic periods, your performance can drop from normal speeds of 300 to 500 Kbps to poke along as slowly as with that old factory-installed modem.

Before Making the Choice Before choosing a technology, you should consider how you want to distribute Internet access in your home or small office. Most high-speed technologies currently deliver access to Macs via 10 Mbps Ethernet, so each wired computer needs an Ethernet port. If you plan to share access among several computers, you must set up an Ethernet (see "Link It Up," November 1999) or wireless (see "AirPort Base Station and AirPort Card," *Reviews,* February 2000) network. (Also see "Simultaneous Surfing," *How-to,* September 2000.)

Providers often charge more for multiple computers (usually the fee is listed as an "IP address" charge), and some providers don't support Macs very well. Once you've decided on a type of service, check out the sidebar "Choosing a Fast-Internet Provider" for pointers on picking the best ISP for you.

Safe and Secure And if you're worried about security—an important issue with always-on Internet connections—you may want to invest in a firewall product to protect your computer from hackers (see the sidebar "Make Your Mac Hacker-Proof" in "Protect Yourself Online," July 2000). Now read on to get the lowdown on each technology—and to discover the best one for you.

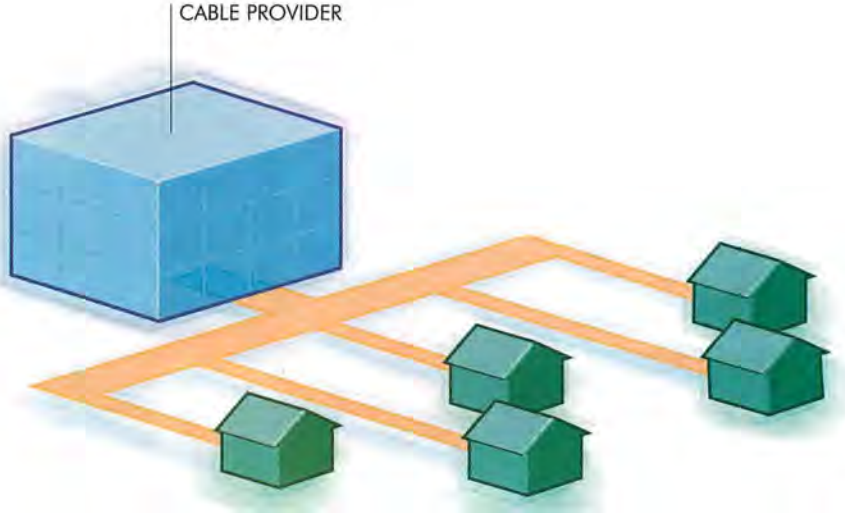
CABLE: Fast but Shared

Currently the most popular means of fast Internet connection, a cable modem is also likely to be the least expensive. Using your coaxial television cable and a

continues

CABLE

All users in a neighborhood share the same network—traffic is routed through local concentrators that accommodate 500 to 1,000 homes. Concentrators connect to the cable provider over fiber-optic lines.



ARNE HURTY

CHOOSING A FAST-INTERNET PROVIDER

CHOICE IS A WONDERFUL THING, but when it comes to high-speed–Internet providers, the number of choices can befuddle even knowledgeable searchers. How do you find your way through the array of promises, features, and special deals and pick the provider that's best for you? Here's a quick map to lead you through the maze.

The first step in choosing which service to buy—cable, DSL, ISDN, or satellite—is to consider your needs and the fundamental limitations of each technology. Cable Internet providers usually do not provide static IP addresses, which means your numeric location on the Internet changes periodically. This can be a problem if you must access services, such as your employer's internal servers, that secure remote access by IP address. Cable providers also often disallow Web and FTP serving, which may clash with your Internet lifestyle. If you're a casual surfer without these special requirements, cable's attractive pricing (often lower than any other fast Internet service) may outweigh these disadvantages.

Telecommuters will likely find DSL a better choice, as DSL providers often offer static public IP addresses, limited Web serving, and even minimum bandwidth guarantees.

Satellite Internet service is expensive and more complex to install, so you shouldn't even consider it if you can get cable or DSL. However, satellite-delivery prices are often competitive with ISDN's for heavy users, as both services incur usage charges.

Choosing between competing providers for the same service is only an issue with DSL and ISDN (cable providers do not yet permit competition on their networks, and satellite service is a single-vendor service). DSL, however, is intensely competitive, and you may well find several vendors vying for your Internet dollar.

Compare features and price to decide on a DSL or ISDN provider. Certain features—such as multiple IP addresses or a Web site on the provider's server—may be essential to you, setting the bar for competing vendors. Make sure you can get the features you require before considering price.

Every high-speed Internet service has two price components: start-up fees and monthly charges. Here is where shopping around can pay off, as many providers offer periodic specials in exchange for term commitments or affiliated purchases. Cable providers, for example, often give their existing cable-TV subscribers discounts on installation or monthly service. Start-up fees include the cost of the modem, which can be as high as $800. Sign up for a one-year hitch, however, and the provider may discount part or all of this cost.

Follow these guidelines, and you'll get more than just a fast Internet connection—you'll get one that you can use the way you want to use it.

Finding a Fat Pipe

COMPANY	SERVICE	SPEED	CONTACT	PRICE [A]
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Cox@Home	Cable	1.5 Mbps–3.0 Mbps	www.cox-internet.com [B]	From $39.95/month; price varies with local cable provider.
Comcast	Cable	300 Kbps–1.5 Mbps	www.comcastonline.com [B]	$32.95/month for Comcast Cable customers; $42.95/month for others; $7/month modem-rental fee.
Covad	DSL	144 Kbps–0.5 Mbps	www.covad.com	Price varies with ISP selection. [C]
FreeDSL	DSL	144 Kbps–1.5 Mbps	877/993-7333, www.freedsl.com	$0–$34.95/month (free service forces display of banner ads); Windows software requires Windows emulator.
Hughes DirecPC	Satellite	up to 400 Kbps	www.direcpc.com [B]	$20–$110/month for limited connection time, plus $2/hour for additional time.
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MediaOne RoadRunner	Cable	up to 1.5 Mbps	888/339-3160, www.mediaonerr.com	$39.95/month in most areas; includes modem rental.
Northpoint Communications	DSL	144 Kbps–5 Mbps	877/436-7375, www.northpointcom.com	$39.95/month for up to 784 Kpbs, includes ISP charges; higher speeds for business users only, prices vary by ISP.
Pacific Bell	DSL	384 Kbps–6 Mbps	888/884-2375, www.pacbell.com/dsl	$39.95–$199/month depending on speed. Service also available from SBC, Nevada Bell, Ameritech, and SNET.
Rhythms	DSL	144 Kbps–7.1 Mbps	800/749-8467, www.rhythms.com	$39.95–$99.95/month depending on speed, plus ISP charges of $15–$200/month.
Telocity	DSL	up to 1.5 Mbps	888/773-3349, www.telocity.com	39.95/month; no installation or modem fees; no annual contract.
US West	DSL	256 Kbps–768 Kbps	877/665-6342, www.uswest.com	$19.95–$29.95/month depending on speed, plus ISP charges of $15–$100/month.
Verizon	DSL	256 Kbps–1.5 Mbps	877/483-9490, www.gte.com/dsl	$32.50–$215/month, plus ISP charges of $15–$100/month.

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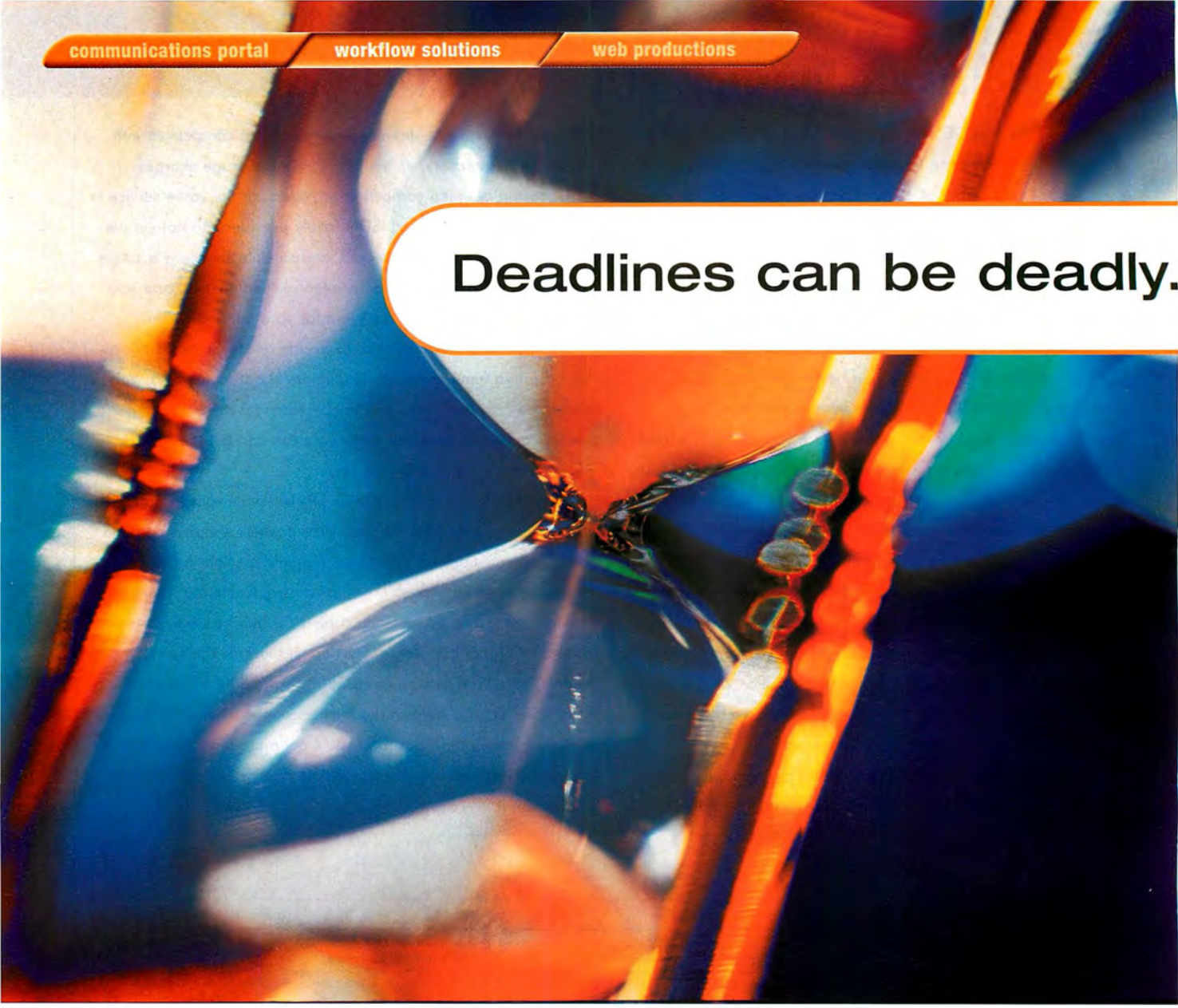

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special modem, you can reach speeds as fast as 10 Mbps for downloads and 2 to 3 Mbps for uploads—cable is easily the fastest technology overall. But because you must share that 10 Mbps with hundreds of your neighbors, your performance can be dragged down to analog-modem speeds during peak usage periods—usually late afternoon and early evening.

The Cost Cable service costs between $30 and $60 per month, in addition to your monthly cable-TV service. Installation in a home is often free, but because cable wiring is not usually installed in office buildings, expect some installation fees if you're in a commercial structure.

The Quirks The FCC has so far declined to force cable operators to open their networks to competitors, so cable Internet service is usually available from only one provider per market—the same company that delivers your cable TV. If you're dissatisfied with the service of your cable provider, you might have to find another technology to use.

DSL: Over Your Phone Line

DSL is the fastest-growing high-speed service, with dozens of new providers entering the market every month. Running over ordinary phone lines at speeds as fast as 6 Mbps for downloads and 1 Mbps for uploads, DSL promises speed without sharing. But potential speed depends on your home's distance from your local phone company's central office—after about three miles (16,000 feet), the signal degrades too much to be usable. The most common flavor of DSL is Asymmetrical DSL (ADSL), which features fast download speeds but slow upload speeds. Slow uploads make ADSL impractical for high-volume Web or FTP serving, but DSL service runs over your existing analog phone line without interference—meaning you can surf and talk on the phone at the same time—obviating the need for a second phone line.

The Cost ADSL is a less-expensive DSL variant, costing $40 to $200 per month (you'll pay more for faster speeds). If you live close to your phone company, you have more speed choices—and therefore more price options. If you work from home and frequently upload data to a remote server, consider paying more for Symmetrical DSL (SDSL), which has equal upload and download speeds. In some places, you'll pay two to three times the

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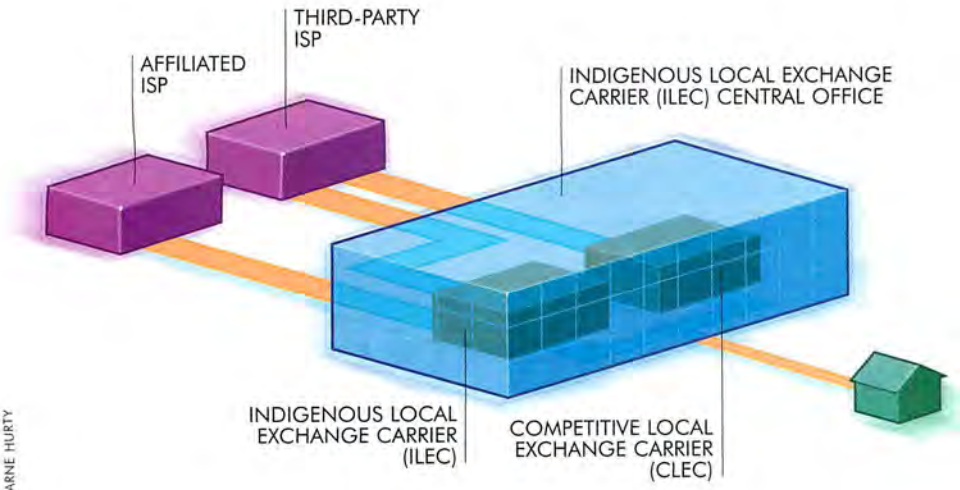

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DSL

You choose a DSL carrier from your ILEC or an available CLEC, and you choose an ISP affiliated with an ILEC, or a third-party ISP. Your connection then travels over regular copper telephone lines to and from your home.

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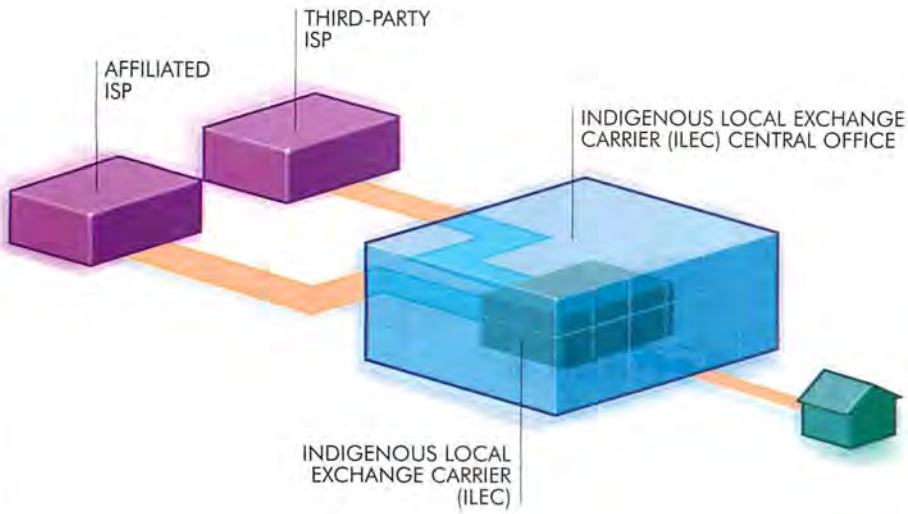

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ISDN

You buy ISDN from your local carrier and choose an ISP—affiliated with your ILEC or with a third-party—to dial up to. (Unlike DSL and cable, ISDN isn't "always on," so you need to dial in when you want to be online.)

monthly cost of ADSL, but it's worth the money if you need fast uploads. Many providers, such as Pacific Bell Internet, also offer custom telecommuting and branch-office services that let customers use DSL to connect remote users with office LANs—for an extra charge.

The Quirks All DSL orders start with a qualification check, in which the DSL provider determines how far you are from the local phone company and tests your line to determine what speeds are available to you. Be advised, however, that nothing is guaranteed until the service is actually delivered; technical complications may require increased fees or prevent you from getting DSL at all. Like long-distance companies, many providers are trying to underbid one another to snag customers. And as with long distance providers, promised performance tends to exceed what is actually delivered. One Web site that can help you locate a cheap DSL provider is www.dslreports.com, which includes online qualification checks for several nationwide DSL providers and a wealth of general DSL information.

ISDN: The Dependable One

ISDN is the oldest high-speed connection technology—it's been around since the late 1980s—but it's also the slowest, with a top speed of 128 Kbps. ISDN requires the use of a special digital phone line from your local phone company, but the service is available almost everywhere.

Unlike other high-speed options, ISDN isn't always on, but connecting with ISDN doesn't take long—less than a second, compared with almost a minute for analog modems. Unfortunately, the connection drops after a minute or two of inactivity, so you can't easily use it for Web and FTP serving.

The Cost The ISDN line itself typically costs about twice as much as an ordinary phone line: from $25 to $50 per month. Internet service is another $25 to $50, which brings the total to between $50 and $100 in monthly charges. These numbers don't include hidden one-time fees, such as $100 to $300 in installation charges, and one- or two-cent usage charges—per channel, per minute—whenever you're connected to your ISP. (ISDN provides two 64 Kbps paths that can be used for data, voice, or a combination of both.) Fortunately, because ISDN is a dial-up service, you have a great deal of choice among providers. You should shop around for the best deal.

The Quirks Keep in mind that ISDN follows the rules of telephone dialing, which means that unless your Internet service provider is local or has a toll-free number, you'll pay a premium in long-distance charges.

SATELLITE: High Speed in the Boondocks

If you can't get cable, you're out of range for DSL, and you don't want ISDN charges, Internet by satellite may be the answer for you. Only one provider currently offers this service: DirecPC (also the maker of DirecTV satellite television service). Promising speeds as fast as 400 Kbps, DirecPC exploits a weird split-access technique that uses a small 2-foot-wide satellite dish to receive Internet

continues

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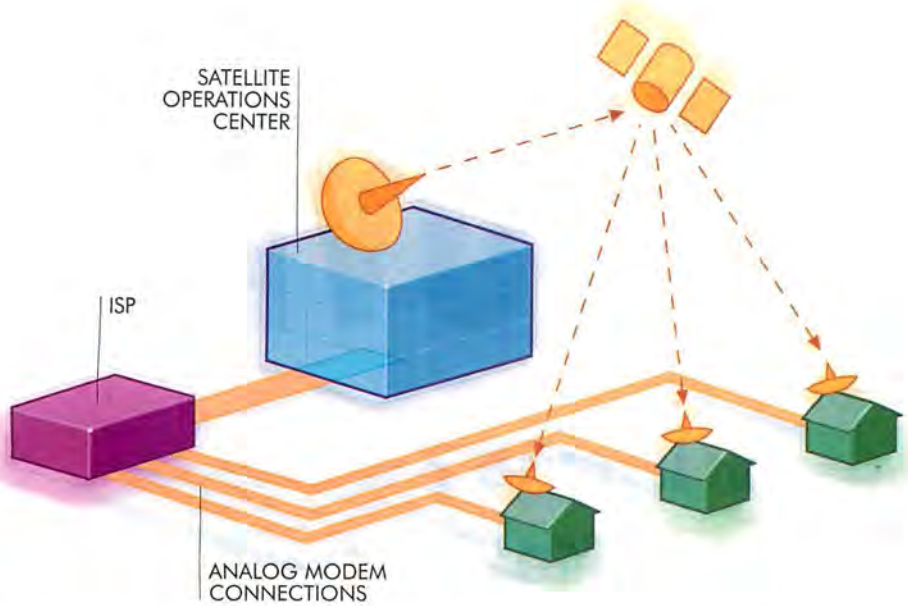

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SATELLITE

A satellite dish on your house receives data, but to send requests, you need a dial-up modem as well—satellite technology currently works only one way. Web pages addressed to your computer are beamed from the sky—but they are broadcast to everyone in your geographical area.

data and pipe it to a computer via its USB port or a PCI card. But the satellite dish only *receives* data. To send requests to the Internet, you need a modem Internet connection with an ISP. Your requests go out to DirecPC via the modem connection, and responses come back via satellite. Upload speed is therefore limited to your modem's maximum capacity—a 33 Kbps upload speed is the limit of a 56 Kbps modem.

The Cost DirecPC's single-user home service is $29.99 per month, which includes modem Internet service ($19.99 per month if you use your existing modem ISP). This buys you 25 usage hours per month, with additional hours costing $1.99 each ($0.99 with your own modem ISP). If you're a high-usage surfer, you can also get bulk packages for a lower per-hour cost. Of all the available high-speed options, this one is the most complex to install, so unless you're handy with tools, you'll want to have a professional installer do the job, at a cost of $200 to $300.

The Quirks At press time, DirecPC's software did not support Macintosh USB or Windows emulation. To connect Macs to the Internet, you have to use a Windows 95 PC as an intermediary, running third-party proxy software to share the connection with your Macs via Ethernet.

More Info:
www.dslreports.com

Visit this Web site to get news and real user feedback on high-speed Internet access and ISPs—before you buy.

LINK

The Last Word

If you're tired of slow Web surfing and don't mind a little added cost, now is a good time to jump into the speed-surfing arena. Cable is the most convenient choice, with the highest potential speed and lowest price. DSL is the second-fastest option, but it costs more, and speed depends heavily on your distance from your local phone company. Either of these options gets you a dedicated Internet connection at megabit-or-better speeds, and both options are much faster than ISDN, which is worth looking at only if you can't get cable or DSL. But beware of the usage charges.

If you're really out in the hinterlands, a satellite feed may be your only option for high-speed access, but for now you'll need a Windows-compatible PC to enable access for your Mac.

The service you choose will depend largely on what options are available to you and what features you need. Now that you've figured it all out with the help of this guide, get online with a fast connection, and show Grandpa a thing or two. **m**

Contributing Editor MEL BECKMAN is a consulting network engineer who helps Internet service providers implement high-speed digital access.

iMovie:

Harness the Powers of iMovie 2 to Make Your Home Movies Even Better

Sometimes the sequel surpasses the original. That definitely applies to iMovie 2, the latest version of the Apple software that has made digital video editing easy for everyone. iMovie 2's star attractions include new editing capabilities, glitzy special effects and title styles, and a popcorn bucket full of tweaks and interface enhancements.

Despite these improvements, iMovie 2's basic premise has not changed. Connect a DV camcorder to your Mac's FireWire port, and then use iMovie to bring video into your Mac, clicking on iMovie's buttons to stop, start, and rewind your camcorder. Next, use iMovie's editing features to organize and polish scenes, adding text titles and transitions as you go. Finally, transfer your finished epic back to videotape via FireWire, or export it as a QuickTime movie for the Web. Thanks to FireWire and the all-digital DV formats (such as Digital 8), video quality remains consistent as you

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The Sequel

BY JIM HEID

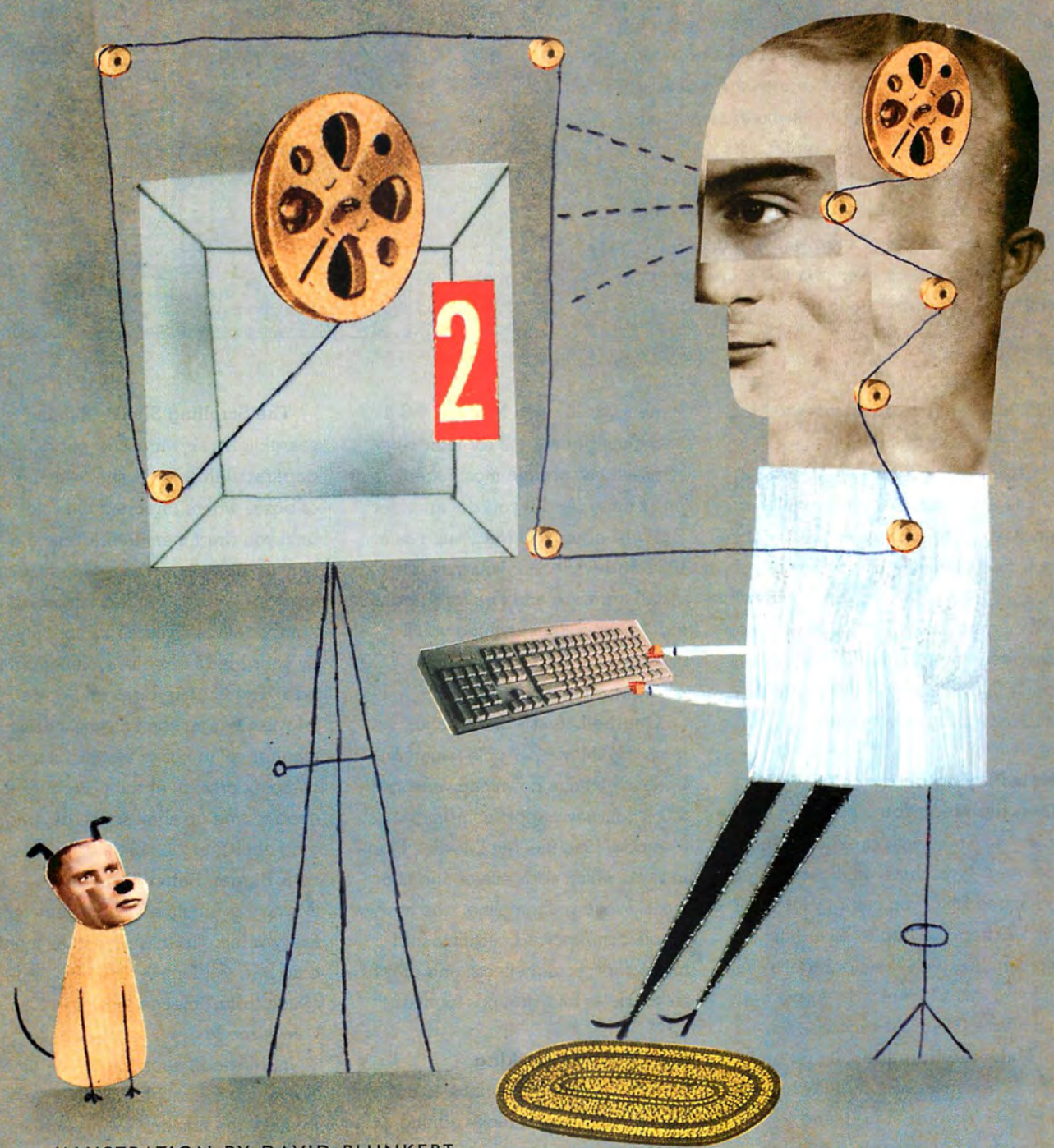

ILLUSTRATION BY DAVID PLUNKERT

Creating Cutaway Shots

A *cutaway shot*—where the camera angle changes to show, for example, a close-up of Grandma's garden as she talks about it—is a common video-production technique. One variation on this theme is a *reaction shot,* where the angle changes to show, say, an interviewer nodding solemnly while an interviewee answers a question. iMovie's new Paste Over At Playhead command makes these edits easy to create.

Begin planning reaction shots when you're shooting video footage. While you're filming the school play, grab a couple of shots of the audience. Or after you've shot an interview, move the camera to catch the interviewer nodding.

1 Set Up for the Edit With your footage in the can, you're ready to set up for editing.

First, make sure your primary and cutaway footage exist as separate clips A.

If your footage consists of one large clip, you need to split it into multiple clips. Drag the clip to the timeline, position the playhead where you want to split the clip, and then press ⌘-T or choose Split Video Clip At Playhead from the Edit menu.

For cutaway shots, retain audio from the primary clip and discard audio from the cutaway. Choose Preferences from the Edit menu, click on the Advanced tab, and select the Extract Audio In Paste Over option.

How-to

Making Movies

shuttle video from camcorder to Mac and then back to tape.

If you've used iMovie 1, iMovie 2 will feel familiar, though the differences may trip you up at first. If you're new to iMovie, see "Home-Movie Magic" (April 2000) for an overview of DV moviemaking. And in either case, keep reading for a hands-on guide to using iMovie 2's new features and understanding its subtleties.

Now Playing on a Desktop Near You

Every new Mac with FireWire includes iMovie 2. If you have an older FireWire-equipped Mac, you can buy iMovie 2 for $49 from the Apple Store (http://store.apple.com). The upgrade is available only as a download—Apple does not offer a CD-ROM version.

Make the Upgrade If you buy the iMovie 2 download, you may have an afternoon's worth of updating to do before you can reliably run it. For starters, you'll need Mac OS 9.0.4 and QuickTime 4.1.2 (or later versions—these are the most recent as of press time). And if yours is an older FireWire-equipped Mac, such as a blue-and-white G3, you may have to install firmware and FireWire updates, too. For links to everything you'll need, visit www.macworld.com/2000/11/howto/imovie2.html.

Get the Latest Shortly after releasing iMovie 2, Apple issued an update; you can download version 2.0.1 from www.apple.com/imovie. Also download the free iMovie 2 Plug-in Pack, which adds effects and title styles. While you're online, stop at www.apple.com/imovie/freestuff to find music clips, sound effects, and graphics to use as backgrounds for titles.

New Ways of Working

Most of iMovie 2's interface and feature enhancements make editing more convenient.

The Scrolling Shelf Aim the searchlights skyward and page the paparazzi! iMovie 2's shelf—that grid of boxes where imported clips lie until you drag them to the Timeline Viewer area—introduces a radical new concept: a scroll bar. No longer is the number of clips you can store limited by your Mac's screen-resolution setting (see "The Curtain Rises on iMovie 2"). iMovie's bigger shelf makes it easier to manage all the clips that make up a complex project, and it postpones the need to free up shelf space by dragging clips into the timeline.

A Bigger, Better Timeline iMovie 1's Timeline Viewer depicted every video clip in a project as a tiny blue bar; to identify clips, you had to switch from Timeline Viewer to Clip Viewer mode.

In iMovie 2, each clip in the timeline sports a small thumbnail image. To make the timeline even more informative, choose Preferences from

2

Crop Your Shot The next step is to crop your cutaway shot to the appropriate length.

In iMovie's shelf, select the cutaway shot. Next, click beneath the clip's scrubber bar A to display crop markers. Drag the crop markers (B and C) left or right to indicate which portion of the clip you want to keep. (For extra precision, use keyboard shortcuts: to move a marker left or right one frame, press the left- or right-arrow key; to move left or right ten frames, press the shift key and the arrow key.)

Finally, choose Crop (⌘-K) from the Edit menu.

3

Insert the Cutaway Now you're ready to insert the cutaway. This involves positioning iMovie's playhead at the desired point and then pasting the cutaway shot into position.

First, position the primary footage (named "Grandma" in this example) in the timeline A.

Next, select the cropped cutaway shot (named

"Cutaway" in this example) in the shelf B and choose Copy from the Edit menu.

Now position the playhead C at the spot where you want the cutaway to occur. Finally, choose Paste Over At Playhead from the Advanced Menu.

the Edit menu, click on the Views tab, and then check the Show More Details box. iMovie then displays the clip's file name and duration, and even shows where you've applied iMovie's new fast- or slow-motion effects.

The new Timeline zoom pop-up menu lets you control how much of your project appears in the timeline. To see the entire project, choose the 1∞ setting—similar to the old, non-zoomable timeline in iMovie 1, this setting is ideal for moving clips large distances. When you're working with a lot of small clips, you might prefer a magnified view, such as 5∞ or 10∞.

From Timeline to Shelf In iMovie 1, you could drag a clip from the Timeline Viewer area back to the shelf. In iMovie 2, you can't—you must first switch from Timeline Viewer to Clip Viewer mode. Here's a workaround: In the timeline, select the clip you want to move to the shelf, and then choose Cut from the Edit menu. Then select any clip on the shelf and choose Paste from the Edit menu.

Play Through: Editing Like the Pros What a difference a check box makes. Activate iMovie's Play Through To Camera option (in the Preferences dialog box), and anything you play—a single video clip, a title or transition, or your entire project—plays back not only on the Mac's screen but also on your camcorder.

What's so hot about that? Simply this: the video iMovie outputs to your camcorder plays at full resolution and full motion—it isn't the jittery, preview-quality video iMovie displays on the Mac. Pop out your DV camcorder's LCD monitor, and you can use it to get a far more accurate assessment of the video.

But don't stop there—connect your camcorder's video output to a TV to view your work on a large screen (see "All the Right Connections"). This is how video professionals edit, and once you try it you'll never settle for iMovie's preview-quality playback.

Easier VHS Dubs There's one more benefit to the Play Through option: you can dub your finished projects to VHS or other formats without having to make a DV dub first. Connect your camcorder's outputs to a VHS deck's inputs, and then eject the tape from your DV camcorder. When you choose the Export command, iMovie complains that there isn't a tape in the camcorder and asks if you want to continue anyway. Press your VHS deck's Record button and click on Export. Your DV camcorder acts as an intermediary, passing video and audio to the VHS deck.

A Better Editor

With iMovie 2's new editing features, you can add new layers of visual richness to your projects—and have fun in the process.

continues

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The Curtain Rises on iMovie 2

iMovie 2 Sports a Revamped Interface and New Features Aplenty—Here's a Guided Tour

A The scrolling shelf holds more clips, making it easier to import video and plan your project.

B A collection of buttons takes the place of iMovie 1's animated drawer; when clicked on, these replace the shelf with controls for working with transitions, effects, titles, and soundtracks.

C The enhanced timeline now shows thumbnail versions of clips and information about each clip, including its name and duration. The red bar below the clip at the far left edge of the timeline indicates that a title is currently rendering. iMovie 1's timeline lacked this useful feedback.

D You can zoom the timeline in for detailed work or out to show all of your project.

E The Clip Speed slider lets you create slow- and fast-motion effects.

F With the new Lock Audio Clip At Playhead command, you can lock an audio clip to a specific video clip so they remain synchronized, even if you insert additional clips before them. A small thumbtack icon denotes a locked clip.

G The main transport buttons have changed. The new buttons, from left to right, are Rewind, Home (go to the beginning of the project), Play (or, when it's playing, Stop), Play Full Screen, and Fast Forward.

H The new Advanced menu is the key to iMovie 2's improved audio-editing features.

Show the Reaction In iMovie 1, you couldn't switch to a second video clip while playing back the sound from the first one. This made it impossible to do cutaways and reaction shots, where the camera angle changes to show, say, an interviewer nodding while an interviewee answers a question.

iMovie 2's new Paste Over At Playhead command makes these kinds of edits possible. See "Creating Cutaway Shots" for step-by-step details.

But not all the news is good. A flaw in iMovie 2 can create an audible pop or delete part of a word at the cutaway point. Apple says this is because iMovie currently can't position audio with subframe accuracy. To work around this, time your cutaways to occur at brief pause points, such as between sentences.

Stay Still iMovie 2's Create Still Clip command (in the Edit menu) creates a PICT file containing the currently displayed video frame. Here's one scenario where you might use it: you've made a movie of Junior scoring the game-winning goal, and you've got a great close-up of his smiling face as his teammates hoist him up on their shoulders. If you create a still image of that shot, you can place the still at the end of your movie and add closing credits to it. When played back, the action will

continues

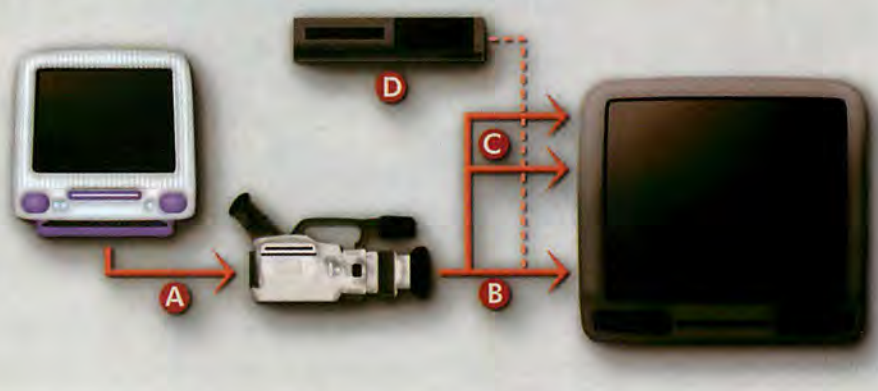
All the Right Connections

iMovie 2's Video Play Through To Camera option (under the Advanced tab in the Preferences dialog box) lets you view your work on a TV as you edit—just like the pros. To activate this feature, connect your DV camcorder to the Mac with a FireWire cable (A) as usual. Then connect your camcorder's video output (B) to the video input of a TV set.

If your TV and your camcorder each have S-Video connections, you should use them for the best video quality. If your TV lacks S-Video but has a composite video input (an RCA jack), use it. If your TV lacks video inputs, add an *RF modulator* between the camcorder and the TV set. You can buy the modulator at Radio Shack for about $30.

When iMovie's Play Through To Camera option is selected, your project's audio will not play back through your Mac's speakers. You can rely on your camcorder's tiny, built-in speaker for sound playback, but you might want to connect your camcorder's audio outputs (C) to your TV's audio inputs, if it provides them; to a stereo system; or to a pair of external amplified speakers.

To make VHS dubs of your creative efforts, you can connect a videocassette recorder (D) between the camcorder and TV: connect the camcorder's outputs to the VCR's inputs, and the VCR's outputs to the TV's inputs.



freeze on Junior's happy mug as the credits roll.

Make It Slow And what would a video of Junior's sports triumph be worth without slow-motion instant replays? iMovie 2 provides them. Just select the clip in the timeline, and then adjust the new Clip Speed slider.

Because slowing down or speeding up a clip alters its audio playback, you'll want to mute the audio of a clip when you change its playback speed. With the clip selected, drag the Clip Volume slider to its far left position.

When you export a project containing slowed clips, iMovie displays a dialog box advising you to render those clips for best quality and giving you the option to proceed with or without rendering. Choose the Render option, and iMovie performs additional processing that blends adjacent frames to smooth out the slow motion.

Restore That Clip You've cropped a clip, but later you need those extra seconds you took out. In iMovie 2, you can reclaim them, as long as you haven't chosen iMovie's Empty Trash command. Select the clip and choose Restore Clip Media from the Advanced menu.

Sounding Better

Audio was a second-class citizen in iMovie 1, but iMovie 2's audio enhancements give you more control over soundtracks.

Extracting Audio You may want to use only the audio portion of a clip—maybe you're making a documentary about your grandmother's childhood, and you'd like to show old photographs as she talks.

To do this, first place the video clip in the timeline, and then select the clip and choose Extract Audio (⌘-J) from the Advanced menu. iMovie copies the audio, places it in Audio Track 1, and then mutes the audio in the clip. Next, select the video clip in the timeline and press the delete key. The video vanishes but its audio remains behind, and you can now position stills and other clips in the video's place.

continues

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Mac FireWire

The Ghost of Playheads Past Say you're working on your kid's birthday-party movie, and you want the sound of a windstorm to play as she blows out the candles. In iMovie 1, positioning audio at a precise point was a trial-and-error proposition. iMovie 2's *ghost playhead* makes it easy.

In the timeline, position iMovie's playhead at the spot where your daughter begins to huff. Now import your sound effect—as you drag it to the timeline, you'll see a semitransparent version of the playhead at the point where said huffing commences. That's the ghost playhead, and it's acting as a bookmark to save your place. Drag the sound effect to that spot.

Better Fade Control In iMovie 1, you could make a clip's audio fade in or fade out, but you couldn't specify the duration of the fade. In iMovie 2, you can: double-click on a clip, and then adjust the sliders.

Splitting Audio Clips Unlike iMovie 1, iMovie 2 enables you to split audio clips, dividing them into two or more separate clips whose position and volume you can adjust independently. You can use this feature to adjust a music soundtrack's volume levels. Say you want music to begin at full volume during your opening credits, become quieter when the action starts, and then return to full volume for the closing credits. With the music track selected, position iMovie's playhead at the end of the opening credits and press ⌘-T. Next, move the playhead to the start of the closing credits and press ⌘-T again. This action splits the music track into three separate clips—select just the middle one and lower its volume slider.

To Good Effect

iMovie 2's new Effects panel is the gateway to video effects ranging from subtle to silly. You can tweak clips shot under adverse lighting conditions using the Brightness/Contrast controls. The Adjust Colors tool fine-tunes color balance—handy when you shoot under incandescent light and forget to adjust your camera's white balance.

The Black And White effect, which strips away color, can add a fun retro look to a clip, as can Sepia Tone, which gives a clip a rust-tinted, antique-looking color cast.

Effects over Time In iMovie 2, effects aren't an all-or-nothing proposition—iMovie can apply or remove an effect gradually. Apply the Black And White effect over time to make a clip start in black and white and turn into Technicolor. Animate the Soft Focus effect to make a clip start out blurry and come into focus—or vice versa.

To animate effects, use the Effects panel's Effect In and Effect Out sliders. Drag the Effect In slider to the right if you want the effect to appear over time. You'll see a time indicator in the panel's preview area, showing how much time will elapse until the effect is fully visible.

To make an effect go away over time, drag the Effect Out slider to the left. As you drag, the preview area's time indicator shows when the effect will start to fade. Here, you're measuring time from the *end* of the clip. To have an effect begin to go away two seconds before the end of the clip, drag the Effect Out slider to the left until the time indicator reads 02:00.

The Last Word

Some additional features make their screen debut in iMovie 2. You can now adjust a title's type size, and there are several new title styles to choose from. A new set of sliders gives you more control over title timing, allowing you to specify the speed of animated titles, for example.

Apple also tweaked iMovie 2's export features, but not all the changes are good. To improve performance, Apple changed iMovie's default Web, e-mail, and CD-ROM export settings to use the H.263 compression scheme. This lets you see the final results faster, but H.263's image quality is inferior to that provided by the Sorenson Video compressor in iMovie 1. If you want the best possible quality, choose the Expert option in the Export dialog box, and specify Sorenson Video for compression.

Compressing video for the Web and CD-ROMs is an art unto itself. To learn about it, visit the sites listed in the Links boxes. And don't miss next month's *Macworld*, where we'll continue our iMovie how-to coverage and look at exporting movies with iMovie. **m**

A contributing editor for *Macworld* since 1984, JIM HEID writes and lectures on all subjects related to digital audio and video.

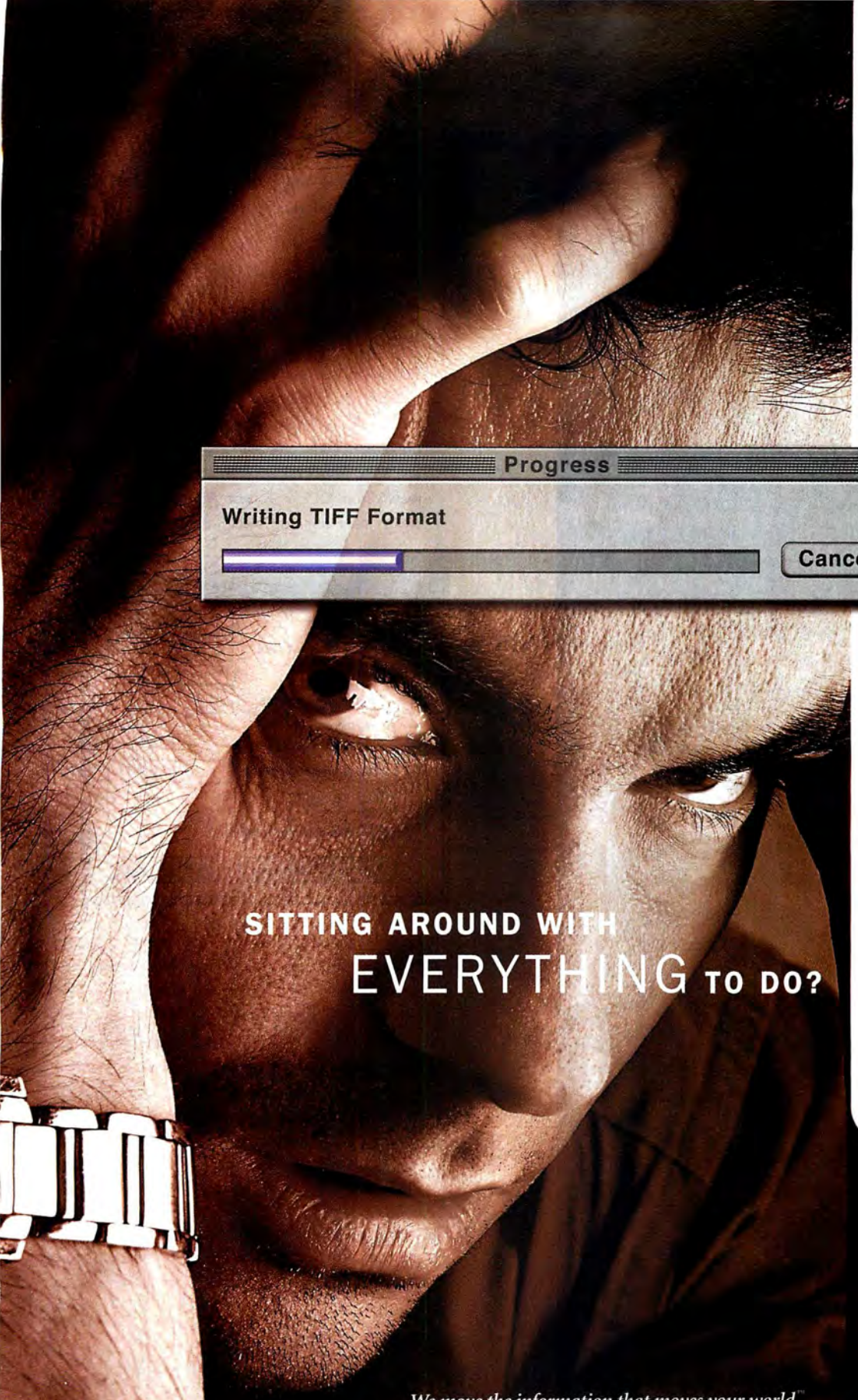
LINKS

More Info: www.codeccentral.com

Operated by Terran Interactive, this site contains excellent primers on shooting, editing, and compressing Web and CD-ROM video.

More Info: www.icanstream.com

Silly name, great site. This joint venture between several giants in digital video contains compression tutorials and free downloads of compression and DV editing utilities.



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JAMES BRADBURY

Digital Debt Reduction

Use Quicken 2000's Tools to Get Out of Debt

It's the American way: you're a little too free and easy with that magic piece of plastic, and next thing you know, you're carrying a monthly credit card balance at an interest rate that would make a loan shark blush. The financial experts agree: the first step toward getting your personal finances in order is to pay off consumer debt.

They make it sound so easy.

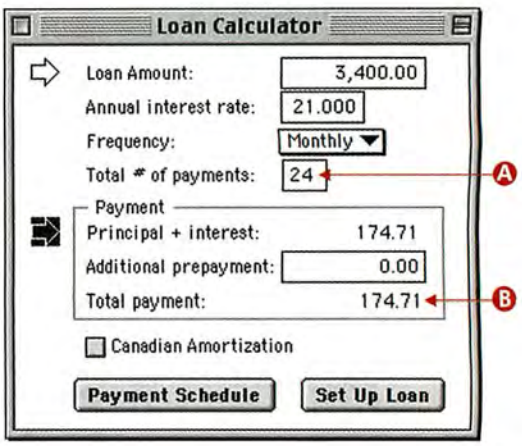
In fact, getting out of debt is never easy, but you can make it easier with Intuit's Quicken 2000 (650/944-6000, www.intuit.com). If you're really serious about living debt-free, you'll have to make basic changes in your spending habits—but Quicken can help you plan a strategy that will keep you on track.

Before you fire up your Mac, though, a little preparation is in order. First, figure out exactly how much you owe on all your credit cards. Second, try to consolidate that amount into a single debt at the lowest interest rate you can find, whether it's a home-equity loan, a teaser rate on a different credit card, or a loan from your grandmother. Most important (and painful), commit to a cash economy. That means cutting up your credit cards. If you need a credit card, get a debit card. From now on, you won't be spending more than you're earning. **m**

JAMES BRADBURY is a former *MacUser* editor who believes that no one should own more credit cards than bicycles.

1 Come Up With a Plan Once you know how much money you owe and what rate of interest you're paying on that debt, you can come up with a plan for exactly how long you'll take to pay it off.

To help you determine this goal, Quicken 2000 has a Debt Plan button. Found under the Assets & Debt tab, it takes you to a Java applet. Unfortunately, the button works only with Netscape Navigator. If you use another browser, you can get the same results from Quicken's Loan Planning Calculator (Activities: Planning Calculators: Loan).



Enter the amount of your credit card debt in the Loan Amount field, and then enter the annual interest rate in the next field. Enter the number of months you expect to take to pay off the loan, and you will see your total monthly payment. If the monthly payment is more than you can spare each month, increase the number of months you'll take to pay off the debt.

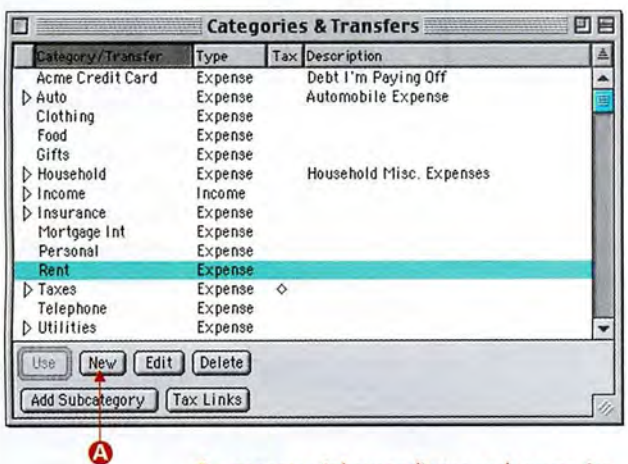
When you're done, you should have two crucial pieces of data: how many months it will take you to pay off the debt (A) and how much money you must budget each month to achieve that result (B). (You can readjust these numbers after you've set up the rest of your budget in the next three steps.)

2

Set Up Categories If you haven't been using Quicken categories to track your expenditures, now is the time to start. Only by using categories can you construct a realistic budget. Otherwise, you'll just be guessing where your money goes each month.

If you've already used Quicken, look over your existing categories to confirm that they make sense. Keep category names simple (Food or Car, for example), and create a suitable category for every major recurring expense.

If you're new to Quicken, accept the default Home categories that Quicken sets up when you create a new data file (⌘-N) or start Quicken for the first time. Then add or delete categories via the Categories & Transfers window (⌘-L).



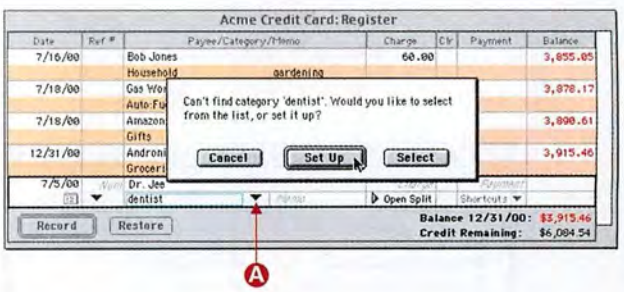
For nonessential expenditures such as movies, lattes, designer shoes, and eBay purchases, create a catch-all category called Personal by clicking on the New button A in the Categories & Transfers window.

Also, add a new category for payments to your debt. In our example, it's called Acme Credit Card.

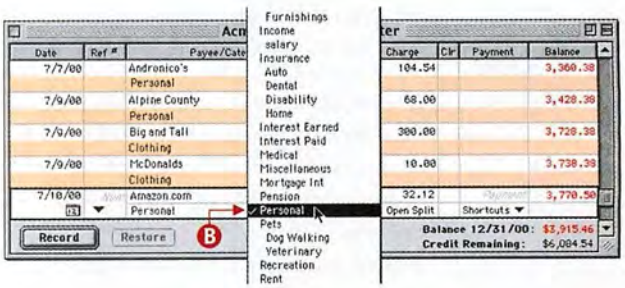
3

Categorize Your Transactions Now go through your Quicken checking account and credit card registers and put each transaction into one of the categories you've set up. Do this for at least three months of transactions.

Assign categories either by clicking on the down arrow in the category box A or by typing the first few letters of a category name (Quicken will fill in the rest automatically).



If you come across an essential expenditure that simply doesn't fit into any of your existing categories, you can quickly add a new category by typing in the name, hitting return, and clicking on Set Up.



Remember to put nonessential expenditures in the Personal category B you created in step 2. Put anything you spend that doesn't fit one of the standard categories—including cash that you withdraw from the ATM—as Personal unless you spent the money in another category, for example, Food.

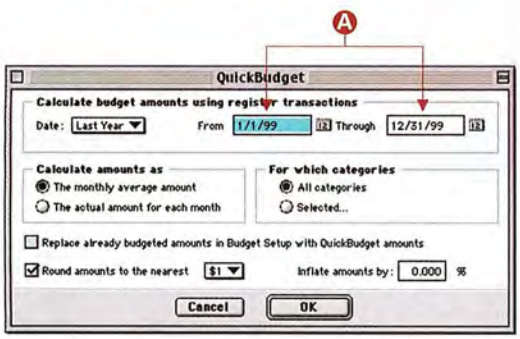
Don't neglect to categorize your regular income. The money you expect to earn every month is an essential element of your budget planning.

continues

4

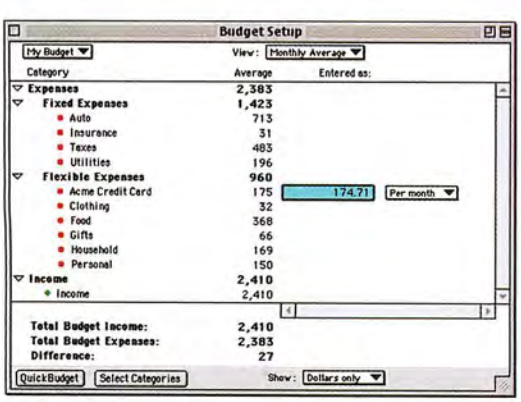
Create Your Budget Now you should be ready to create a budget. Your goal is to fiddle with your expenses until they are less than or equal to your income.

The fastest way to create a budget in Quicken 2000 is to select the QuickBudget option in the Create Budget dialogue box (Activities: Budgeting: Budget Setup). This option will help you set up an initial budget based on all those transactions you categorized in your registers.



When you specify the date range that QuickBudget will use to create a budget (A), the range should encompass only transactions that you carefully categorized in step 3.

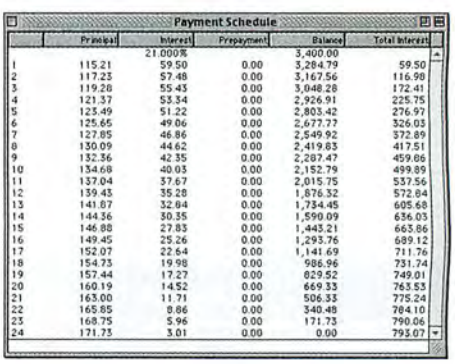
Quicken 2000 separates categories into fixed (such as your taxes) and flexible (such as your clothing costs). The bottom of the Budget window tells it all: if Total Budget Expenses is greater than Total Budget Income, you've got to make some adjustments to your flexible expenses.



5

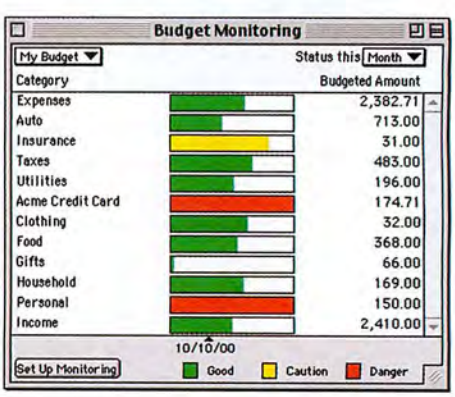
Track It Simply creating a budget is not enough. Quicken 2000 really excels at keeping track of how well you're actually following the plan you've just made.

Once you've finalized your payment plan, go back to the Loan Planning Calculator and click on Payment Schedule. You can print out a copy of this schedule for added motivation.



	Principal	Interest	Prepayment	Balance	Total Interest
		21.000%		3,400.00	
1	115.21	59.50	0.00	3,284.79	59.50
2	117.23	57.48	0.00	3,167.56	116.98
3	119.28	55.43	0.00	3,048.28	172.41
4	121.37	53.34	0.00	2,926.91	225.75
5	123.49	51.22	0.00	2,803.42	276.97
6	125.65	49.06	0.00	2,677.77	326.03
7	127.85	46.86	0.00	2,549.92	372.89
8	130.09	44.62	0.00	2,419.83	417.51
9	132.36	42.35	0.00	2,287.47	459.86
10	134.68	40.03	0.00	2,152.79	499.89
11	137.04	37.67	0.00	2,015.75	537.56
12	139.43	35.28	0.00	1,876.32	572.84
13	141.87	32.84	0.00	1,734.45	605.68
14	144.36	30.35	0.00	1,590.09	636.03
15	146.88	27.83	0.00	1,443.21	663.86
16	149.45	25.26	0.00	1,293.76	689.12
17	152.07	22.64	0.00	1,141.69	711.76
18	154.73	19.98	0.00	986.96	731.74
19	157.44	17.27	0.00	829.52	749.01
20	160.19	14.52	0.00	669.33	763.53
21	163.00	11.71	0.00	506.33	775.24
22	165.85	8.86	0.00	340.48	784.10
23	168.75	5.96	0.00	171.73	790.06
24	171.73	3.01	0.00	0.00	793.07

The Budget Monitoring feature (Activities: Budgeting: Budget Monitoring) tracks spending and shows you how well you're conforming to your budget in each category. A yellow bar means you're close to going over budget. Red means you've crossed the line.



If you keep a close watch on expenses (and make that monthly payment on your debt), you'll be back in the black before you know it.

More Info:
www.macworld.com/2000/11/howto/morequicken.html

To learn more about budgeting in Quicken, check out this article at Macworld.com.

LINK

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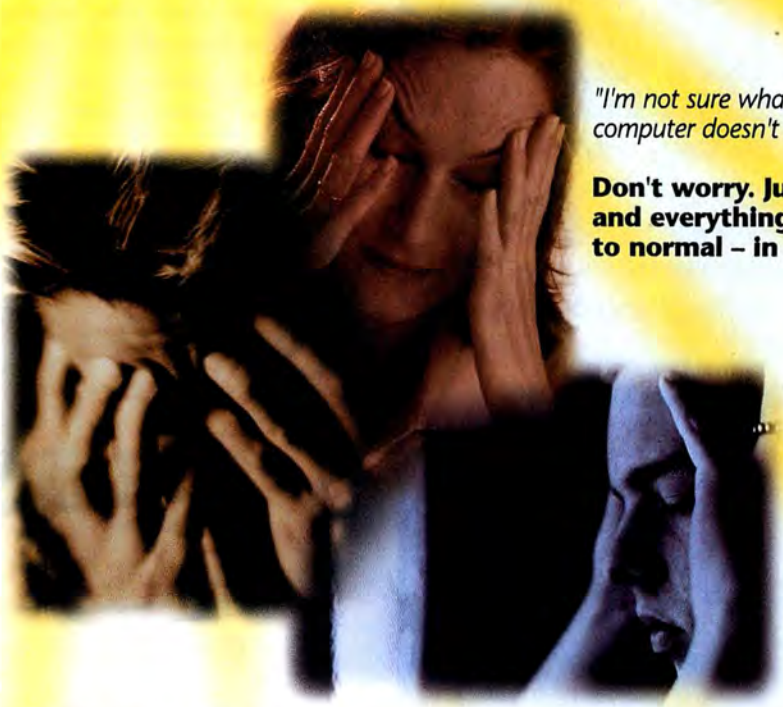

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BROOKE C. WHEELER

Trouble-Free Transparency

Save Time with Illustrator 9's New Transparency Tools

How-to Transparency

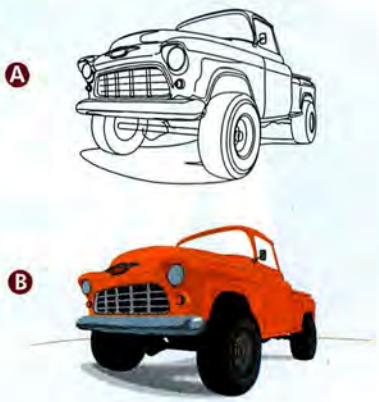
Creating the illusion of transparency is something Adobe Photoshop users have taken for granted since the introduction of the Transparency slider in version 3. But Adobe left Illustrator users behind, forcing them to rely on laborious and unsatisfying draw-and-fill methods to create transparency effects—until the release of Illustrator 9, that is.

Graphic designer Rob Reed is a big fan of Illustrator 9's new Transparency palette. Rob designs Web sites at New York's The Chopping Block (www.choppingblock.com), whose clients include Miramax, Nickelodeon, and Time Warner. With the Transparency palette, Rob can apply different opacities to individual objects, entire layers, strokes, and fills, allowing him to reveal, conceal, and blend multiple parts of an image using a few simple commands.

In this illustration, Rob created complex transparency effects for the windows and body of a truck by building shapes of varying opacities and grouping them together—sometimes applying an additional opacity setting to the entire group. He also used the Transparency palette's different blending modes, such as Hard Light and Multiply, to change the way the layered shapes interact. The result is a visual symphony of blended hues that create the illusion of shiny glass, steel, and chrome. **m**

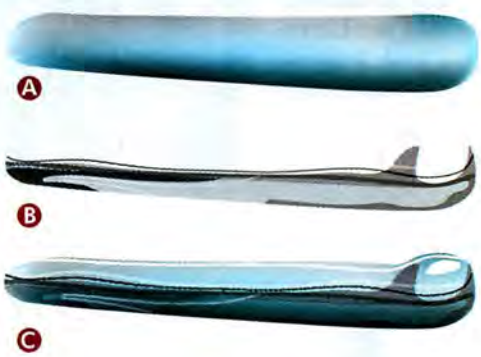
BROOKE C. WHEELER is a freelance writer and former *Macworld* editor who lives in New York.

1



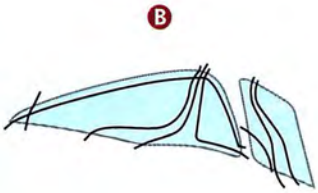
Rob first scanned a photo of his '55 Chevy as a drawing reference. He used the pen tool to draw the truck's initial outline, indicating areas of highlight and shadow **A**. *Using the Outline view mode to exaggerate the truck's lines, he then tweaked details and filled in the outline with solid colors* **B**.

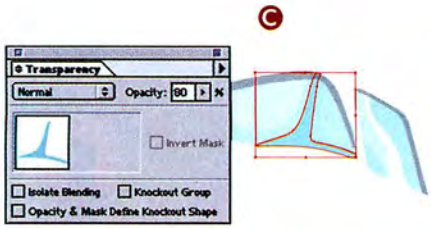
3



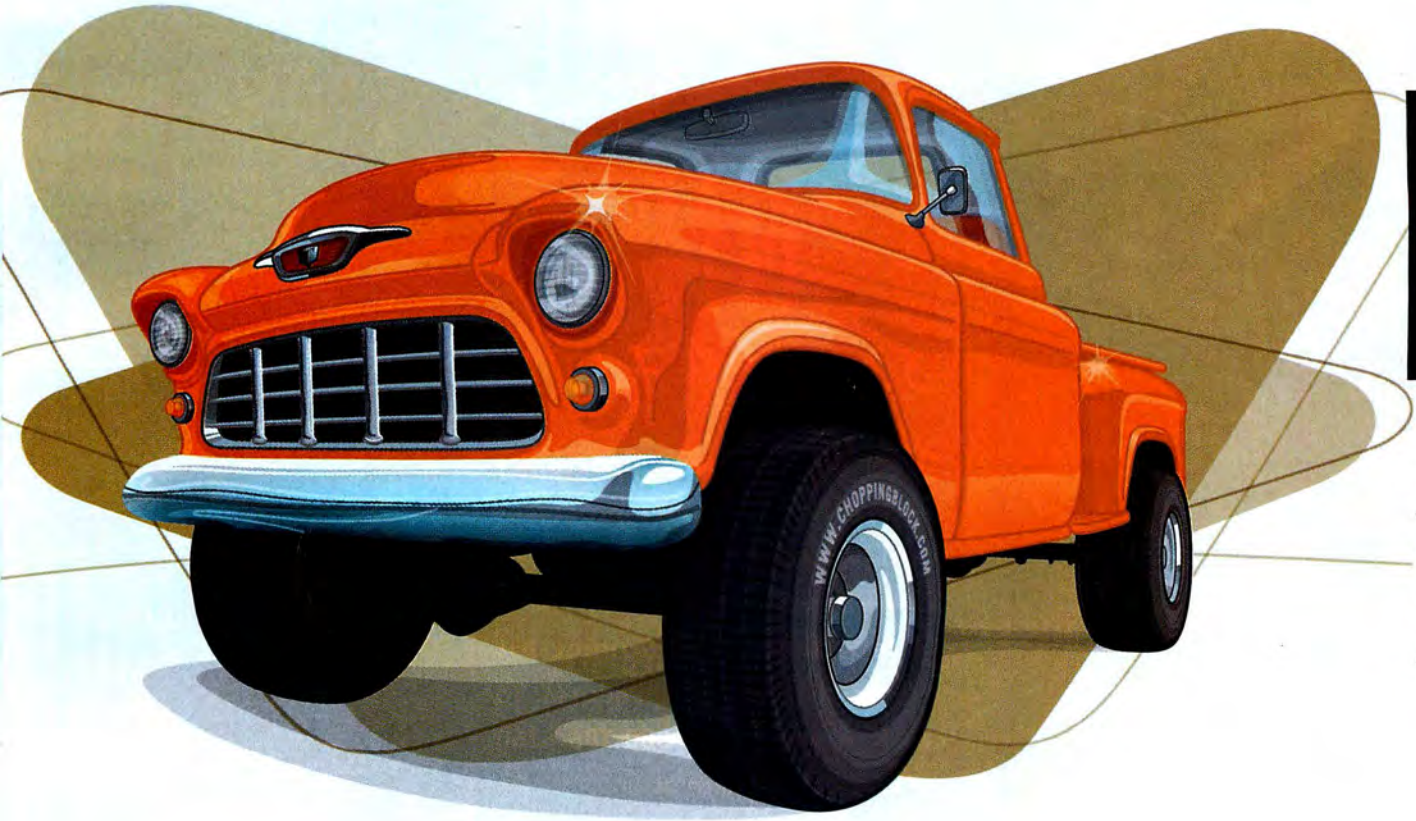
For the complex shadows and highlights of the chrome bumper, Rob layered multiple gradients and transparencies. Using the Gradient Mesh tool, he first created an oblong gradient in the shape of the bumper **A**. *Next, he drew a series of shapes to define the bumper's reflections and filled these with additional color gradients* **B**. *Then Rob adjusted the transparency of the individual shapes and applied a Multiply blend, which intensified and darkened overlapping colors and made the whites completely transparent. The end result* **C** *is a combination of subtle color transitions in some areas and dramatic contrast in others.*

2





Before constructing the truck's windshield, Rob first drew the cab's interior details, such as the rearview mirror, and filled in those areas with solid colors **A**. *Next, he created the glass, drawing lines where he wanted reflections to appear* **B**. *Using the Pathfinder Divide command in the Effects menu, he split the window into separate pieces that fit together like a puzzle. He then gave each section of glass a different opacity (ranging from 10 to 85 percent) and used blending modes such as Hard Light to control how visible the cab's interior would be* **C**.



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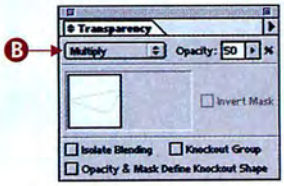

To put a vibrant finishing touch on his illustration, Rob nestled the truck in a background of overlapping colored shapes **A**. *He gave each shape a different opacity and used the Multiply blending mode* **B** *to make the colors intermingle* **C**.

More Info: www.macworld.com/2000/09/reviews/illustrator.html

Read *Macworld's* review of Adobe Illustrator 9.0 for a complete list of new features.

LINK

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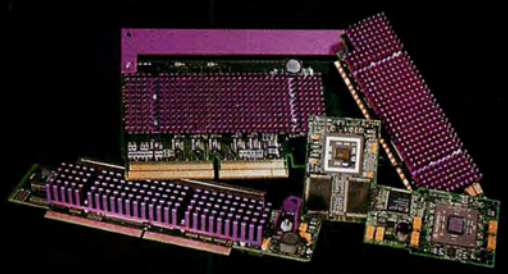

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CHRISTOPHER BREEN

Mac 911

During the past year, Apple has focused its steely corporate gaze on desktop video—claiming that soon everyone will be either playing or making movies on their Macs. If this month's collection of queries is any indication, Apple may be on to something. Our readers appear to be mucking with movies with real gusto, but they're encountering minor difficulties in the process.

Moving Pictures

Our first video conundrum comes from Fairfield, New Jersey: Craig Happ—equipped with a Sony DCR-TRV320 Digital Handycam and a PowerBook G3 with FireWire (via Newer Technology's FireWire 2 Go FireWire card)—would like to know how to move the still pictures he takes with his camcorder to his PowerBook.

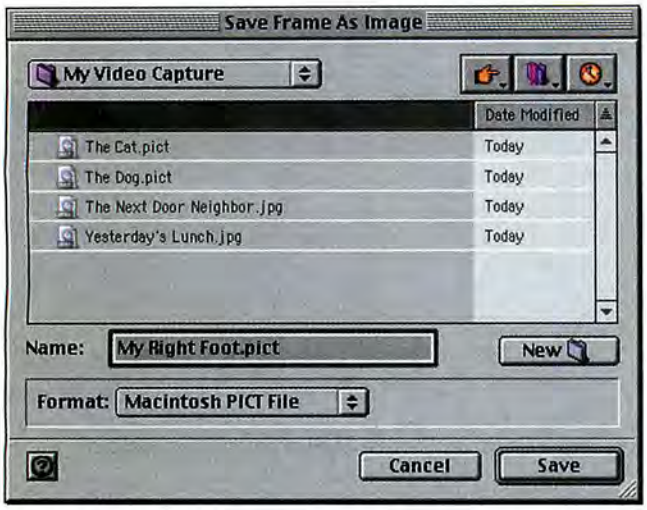
Craig, although you'd like to capture images that appear to be static, the process entails pulling those images from a moving videotape—and you, therefore, require a video-editing application. Fortunately, there's no need to tender one penny to obtain such an application. Apple supplies a solution for anyone with a FireWire-equipped Mac: iMovie, Apple's entry-level (and *free*) digital video-editing program. (If you don't have FireWire, shed no tears into your viewfinder; I have a solution for you, too.)

To begin, ignore Apple's system requirements (yes, iMovie *will so* run on your PowerBook) and download a copy of iMovie from Apple's Web site (www.apple.com/imovie). Connect the FireWire cable from your camcorder to your FireWire 2 Go card, launch iMovie, rewind the camcorder's tape to the location of the picture(s) you want to import, and press iMovie's Import button. As new images appear in iMovie's Viewer window, they will find a place on iMovie's *shelf*—the storage location for movie clips and images. To convert these frames into PICT or JPEG files, simply move your cursor to the shelf, click on the image you want to convert, and select Save Frame As from the File menu. Now select either PICT or JPEG in the Format pull-down menu, name the file, and click on Save (see "Picture Perfect").

We turn now to the non-FireWire solution. Although iMovie won't work for you, I have a free alternative: Strata's VideoShop 4.5 demo—a demo that doesn't let you save video clips but does let you save frame captures as PICT files. To use this demo, you need a way to get video into your Mac—through the video-input ports on AV Macs; a video card that features a video-input port, such as ATI's Xclaim VR 128 (www.atitech.com); or a USB video-capture device, such as XLR8's InterView (www.xlr8.com). Because these video cards and USB devices usually ship with some variety of video-editing software, you may not need to use the VideoShop demo, but if you lack such software, follow along.

Navigate to Strata's download page (www.strata.com/html/demos_updates.html) and grab a copy of the VideoShop demo. Install the demo, restart your Mac, and launch the application. Select Show Digitizing Window from the Windows menu and then Video Settings from the Digitize menu. From the Input pull-down menu, select either Composite or S-Video (depending, of course, on which

continues



Picture Perfect With iMovie's Save Frame As command, you can transfer still images from your digital camcorder to your Mac.

port your camcorder is connected to). Click on OK and start rolling tape. When you see the image you want, click on the Digitize Still Frame button (the button that looks like a camera), and VideoShop will place a PICT file of that frame inside the Cache folder (in the Strata VideoShop 4.5 Demo folder).

The ABCs of VCD

A certain C J Hinke, of Bangkok, Thailand, faces a video playback problem. Specifically, this C person has found that a PowerBook is incapable of playing many of the Video-CDs (VCDs) he or she has purchased, even though these same CDs play back perfectly on a PC.

For those unhip to the concept, VCD is a video format found most often in Asia—many films made in Hong Kong are available on VCD, as are U.S. releases such as *Star Wars Episode 1* and *Fight Club*. VCDs are MPEG-1–encoded movies pressed onto standard CDs rather than DVDs. The advantage of VCD is that the discs are generally less expensive (though poorer in picture quality) than DVDs, and you can play them on standard CD-ROM drives. VCDs aren't widely available in the United States, but you can find them online (from www.coolvcd.com, for example) and in the Chinatown areas of large cities.

Although VCDs should play properly through Apple's QuickTime Player, they often don't because Apple's CD/DVD Driver isn't fully compatible with all VCDs. To get a better crack at playing VCDs, buy a copy of Intech Software's (www.IntechUSA.com) $40 CD/DVD SpeedTools 5.1. Fans of VCD report that Intech's driver is a miracle worker when it comes to making VCDs recognizable.

Memories Are Made of This

And finally, Gary (who apparently lacks a surname) hit a brick wall when browsing Apple's Technical Information Library (http://til.info.apple.com) for information regarding the variety and size of RAM to put into his Power Macintosh 8500. While I admire Gary's pluck for exploring this normally helpful resource, I must point out that it's the wrong place to look.

If you want the skinny on Mac memory configurations, check out these two resources that reveal the memory underpinnings of every Mac model: Apple's own Apple Spec Database (www.info.apple.com/applespec/applespec.taf) and Newer Technology's helpful utility Guru (www.newertech.com). **m**

Contributing Editor CHRISTOPHER BREEN offers Mac tips and tricks each business day via the Daily Tips and iTips newsletters. Visit http://lists.macworld.com to subscribe.

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 is available from the Macworld Online software library (www.macdownload.com).

Tip of the Month

Here's a simple AppleScript that can quickly put pop-up folders from the root level of your hard drive back into place after you've switched screen resolutions. Just replace **"Folder 1"** and **"Folder 2"** with the names of your pop-up folders and insert the name of the last-added pop-up folder after the **close window** command.

```
tell application "Finder"
activate
set popup of container window of folder "Folder 1" of
   startup disk to false
set popup of container window of folder "Folder 2" of
   startup disk to false
set popup of container window of folder "Folder 1" of
   start up disk to true
set popup of container window of folder "Folder 2" of
   startup disk to true
close window "last added folder"
end tell
```

Jordan Dueck
Rosenort, Manitoba, Canada

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The Elura 2MC not only records full motion video, true 30 frame-per-second Progressive Scan Digital Motor Drive™ and digital stills, but stores images on both Flash Memory MultiMediaCard and Mini DV. So now connecting to your PC to e-mail images, stream video and edit digital movies is easier than ever.

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Power Mac G4 Cube

Apple's Pearl of Great Price

POWER MAC G4 CUBE

Rating: 3½

Pros: Tiny footprint; innovative design; easy to set up and upgrade; great speakers and digital display technology; very stable.

Cons: No PCI slots; difficult cable management; poorly designed power switch; skimpy RAM; expensive.

List price: $1,799

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

MACWORLD'S BUYING ADVICE:

The G4 Cube is a computer to be lusted after for its innovative design, but one that may require mainstream and power users to make some compromises. All Apple has to do is add 64MB of RAM, move the power switch to the front, put at least one USB and FireWire port on the back instead of the bottom, and lower the price by $200, and it will have put beauty, brains, and value all in the same small box.

KEVIN CANDLAND

If you agree with the following three statements, the Power Mac G4 Cube is right for you: I don't need to add PCI cards to my Mac. I'm more concerned with a computer's ease of setup and its size than getting the maximum available G4 performance. I'm willing to pay a premium for a computer with a lot of style.

Entry-level users had to agree with these three statements before buying an iMac—and more than 3.7 million did. Now Apple is posing the same questions to its mainstream customers regarding the Power Mac G4 Cube, which offers a G4's processing power and an iMac's ease of setup and distinctive style—though it does so at a premium price.

Style . . .

Let's just get this out of the way right up front: the Cube is a work of art. It's as if previous Mac designs were merely tests, prototypes that honed the skills of Apple's industrial design engineers. And when those skills reached razor sharpness, designers turned their skills on the product they wanted to craft all along: the Cube.

The Cube bears only a passing resemblance to a piece of technology, much less a computer. If not for the thermal vent cut into the top, it would give no clue as to its true nature. It is a thing of beauty.

But you pay a price for this pearlescent machine, and I'm not just talking about the price tag. Gone are most of the compromises that computers make for functionality: all the ports are hidden underneath, giving the Cube a completely smooth surface but making ports difficult to access and cable management a challenge.

Macworld LAB TEST

Cube users with USB devices they plug in and unplug frequently may want to invest in a USB hub; those with FireWire devices may need to leave a loose cable dangling in back.

If you do turn the Cube upside down to get at the ports, be sure to shut it down and then unplug it. The Cube has no fan; it uses that single vent in the top to dissipate heat. And even though the Cube will turn itself off before overheating, the new touch-sensitive power switch on the top of the unit might turn the computer back on while it's upside down if it's still plugged in. Better safe than sorry.

Which brings us to the most questionable part of the Cube's design: the thermal vent. I had to make an effort not to put stuff on top of my Cube, and I didn't always succeed. And while blocking the vent will only cause the unit to go to sleep, that can be annoying.

With a computer this pretty, you're going to want it on your desktop for all to see, not to mention for easy access to the DVD-ROM drive. That's good, because Apple hasn't made it easy for you to plop the Cube under your desk—the keyboard attaches with a short USB cable. Worse, the Cube's speakers have short cables. It's just 26 inches from the headphone jack to each of the clear, spherical speaker cases—hardly enough to get decent stereo separation.

Substance

Assuming you *can* get enough separation between the speakers, the clarity and depth of the sound these two tiny globes produce will amaze you. Even without a subwoofer, they sound wonderful. Match them with Apple's 22-inch flat-panel monitor, the Cinema Display, and you've got a front-row seat at the world's best personal, purely digital home theater.

That's because the Cube is the first totally digital computer. The only analog circuitry in the whole machine is the headphone port and a single VGA port for connecting any monitor not blessed with the new all-in-one Apple Display Connector (ADC), which carries digital video, USB, and power in one fat cable. Once you see the Cinema Display teamed with the Cube's ADC and digital speakers, you'll never go back to analog. Never mind that forgoing on-board analog circuitry necessitated adding the biggest power brick Apple has ever shipped—you knew something had to go to fit so much computer inside a 7-inch-square plastic box.

Speaking of which, after years of building hard-to-open computers, Apple has embarked on a crusade to make Macs the industry's most easily opened machines. The company has reached a new milestone with the Cube. Turn it over (unplug it first) and lift up the recessed handle, and out pops the whole computer, with all the slots and replaceable components clustered around the outside.

Once you have the Cube's innards out, don't be disappointed when all you find are a couple of RAM slots, an AirPort slot, and an AGP 2x slot with an ATI Rage 128 card already installed. This is the iMac of G4s; the tiny case has no space for PCI slots.

However, you do get a 450MHz G4 processor and a 20GB hard drive. A 5,400-rpm drive is standard for all Apple computers that ship with 20GB drives—replacing the 7,200-rpm drive the company used in previous G4 models—and the slowdown is noticeable. You can also upgrade to a 500MHz processor or augment the 64MB of RAM that ships with the Cube—a necessity if you plan to run more than one application at a time.

Even with only 64MB of RAM, the Cube is the stablest Mac I've seen in years. I squeezed as much as I could into that 64MB and proceeded to do things that would have choked an older G4 tower. The Cube I tested was rock solid.—ANDREW GORE

Power Mac G4 Cube Benchmark Results

Macworld LAB TEST

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

	SPEEDMARK 2.1	PHOTOSHOP 5.5				CINEMA 4D XL	SOUNDJAM
		Gaussian Blur	Unsharp Mask	RGB to CMYK	Lighting Effects	Model Render	MP3 Encode
Power Macintosh G4/450 Cube	139	7.6	8.4	21.7	7.9	15:50	2:21
Power Macintosh G4/450 DP	***158***	***4.7***	***5.1***	***20.5***	***5.0***	***7:54***	***1:14***
Power Macintosh G4/450	*146*	*7.1*	*7.7*	*21.0*	*7.8*	*15:43*	*2:10*
	Better ▶	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better

Speedmark 2.1 scores are relative to those of a 350MHz iMac, which is assigned a score of 100. Adobe Photoshop results are in seconds. Cinema 4D XL and SoundJam results are in minutes:seconds. We tested each system with Mac OS 9.0.4, a default system disk cache, and virtual memory disabled for all application tests. We set displays to 1,024 by 768 pixels and 24-bit color. We performed Speedmark tests with original memory configurations: 64MB for the Cube and 128MB for the other systems. We performed Photoshop tests with a 50MB file and used 256MB in all systems; we set Photoshop's memory partition to 150MB and Photoshop History to Minimum. We performed Cinema 4D XL and SoundJam tests using 128MB of RAM; we allocated 80MB of memory to Cinema 4D XL and rendered a model at 640 by 480 pixels with oversampling set to 4 by 4. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds in length and converted it using a default setting of 128 Kbps in SoundJam 2.1.1. Speedmark is a suite of common tasks (see www.macworld.com/speedmark).—**Macworld Lab testing supervised by Gil Loyola**

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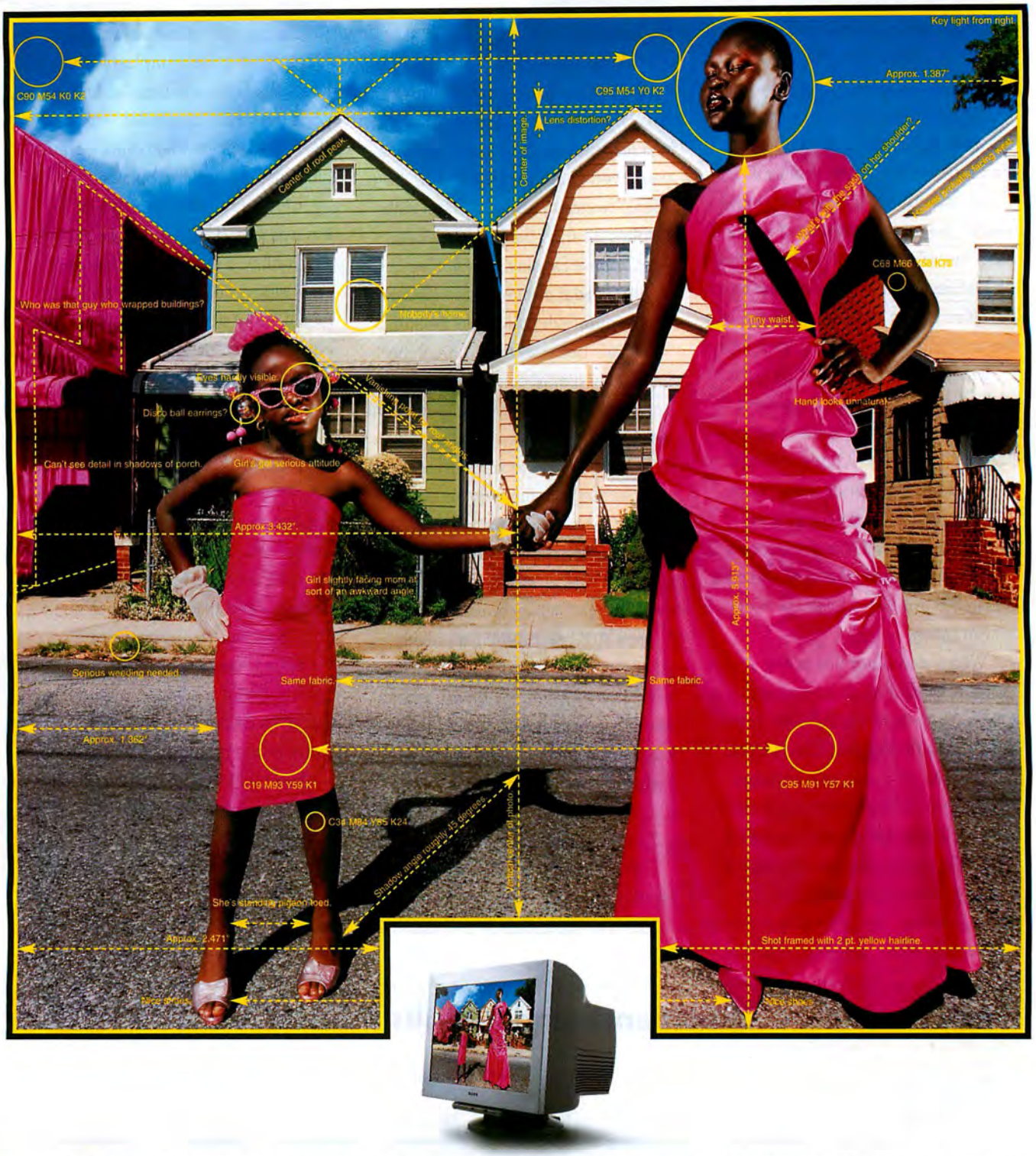

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iMac DV+, iMac DV Special Edition

New iMac Models Offer Improved Features at a Fair Price

KIRK AMYX

Apple's iMac DV Special Edition (left) and iMac DV+

With each iteration, Apple's iMac becomes a worthier computer. The latest crop of iMacs not only offers faster processors, more-spacious hard drives, and—*finally*—a mouse and keyboard not designed for munchkins, but also does so without adding a single penny to the list price. We examined the two high-end models—the iMac DV+ and iMac DV Special Edition (SE)—and confirmed that, in nearly every respect, the new iMacs give you more for your money.

Distinguishable Differences

Now that the iMac comes in four configurations—the basic iMac, the iMac DV, the iMac DV+, and the iMac DV SE—it can be difficult to determine how the various models differ. What separates the iMac DV+ and iMac DV SE from the less-expensive iMac and iMac DV—apart from color, processor speed, and hard drive capacity—is the inclusion of a DVD-ROM drive. Like the iMac DV, both the iMac DV+ and iMac DV SE carry a video port for VGA mirroring, are AirPort ready, and include a copy of iMovie 2. And like all iMac models, these Macs include the new Apple Pro Keyboard (4½; see the review elsewhere in this issue) and Apple Pro Mouse (4; *Reviews*, October 2000), a 512K L2 cache, a Rage 128 Pro graphics chip set, 10/100BaseT Ethernet, a 56-Kbps modem, and USB and FireWire ports.

The iMac DV SE differs from the iMac DV+ in that it has a 500MHz G3 processor rather than a 450MHz one; a 30GB hard drive versus the iMac DV+'s 20GB drive; and 128MB of SDRAM, double the iMac DV+'s 64MB. The iMac DV SE is available

continues

iMAC DV+

Rating: 4

Pros: Good performance; attractive price; worthy keyboard and mouse.

Cons: Skimpy software bundle; too little RAM.

List price: $1,299

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

iMAC DV SPECIAL EDITION

Rating: 4½

Pros: Improved performance; adequate RAM; worthy keyboard and mouse.

Cons: Skimpy software bundle.

List price: $1,499

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

MACWORLD'S BUYING ADVICE:

Although we wish the iMac DV+ offered the same 128MB of RAM as the iMac DV Special Edition and we find the miserly software bundles disappointing, we're pleased with the performance of these machines and with the inclusion of a fully functional keyboard and mouse. These are the best iMacs yet.

Macworld LAB TEST

Solid Performers

Macworld LAB TEST

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

	SPEEDMARK 2.1	SOUNDJAM 2.1.1	QUAKE III
	Overall Score	MP3 Encode	Normal
iMac DV Special Edition 500MHz	**127**	**2:50**	**33.6**
iMac DV+ 450MHz	119	3:14	25.2
iMac DV Special Edition 400MHz	*109*	*3:25*	*25.4*
	Better ▶	◀ Better	Better ▶

Speedmark 2.1 scores are relative to those of an iMac 350MHz (blueberry), which is assigned a score of 100. SoundJam results are in minutes:seconds. Quake results are in frames per second. We tested each system with Mac OS 9.0.4, 128MB of RAM (64MB for the iMac DV+), a 4MB system disk cache (2MB for the iMac DV+), and virtual memory enabled for all tests except SoundJam. We set displays to 1,024 by 768 pixels and 24-bit color. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long and converted it using a default setting of 128 Kbps in SoundJam. Speedmark is a suite of common tasks (see www.macworld.com/speedmark).—**Macworld Lab testing supervised by Gil Loyola**

in graphite and snow; the iMac DV+ comes in ruby, indigo, and sage.

Having a processor with an extra 50MHz and a hard drive half again as spacious as the next model down does make the SE feel more luxurious, but given today's RAM-hungry applications—games in particular—128MB of RAM is quickly becoming a baseline standard. While it's hard to imagine that Apple could equip the sub-$1,000 iMac and iMac DV with 128MB of RAM and maintain their attractive pricing, asking for 128MB on an iMac DV+ doesn't seem unreasonable. Should Apple choose to improve these iMac models in the coming months with faster processors and roomier hard drives, we'd like to see them equipped with more-generous RAM as well.

Our benchmark tests indicate that these iMacs offer better performance than earlier models. In our SoundJam MP3-encoding test, the new iMac DV SE, with its 500MHz G3 processor, encoded our test file 35 seconds faster than the previous iMac DV SE (which had a 400MHz G3 processor). It also performed about 17 percent faster than the old iMac DV SE in our Speedmark test and pumped out an additional 8.2 frames per second in Quake III Arena.

The iMac DV+, at 450MHz, managed to top the original iMac DV SE's performance in all our tests save Quake III, though not by a wide margin. The lower Quake III scores demonstrate how helpful an extra 64MB of RAM would be. The game requires more memory than the onboard 64MB can supply; on a 64MB iMac DV+ you must increase the amount of virtual memory, and that slows game performance.

What's In and What's Out

The most dramatic change in each of these iMacs isn't the iMac itself but its accompanying peripherals—the keyboard and mouse. Apple finally relented, replacing the inadequate input devices bundled with previous iMacs with the Apple Pro Keyboard and Pro Mouse, each a vast improvement over its predecessor.

The Pro Keyboard restores full-size arrow keys, the forward-delete key, and the full complement of function keys. It also adds three volume keys—one for increasing the iMac's volume, another for decreasing volume, and a third for muting the iMac's sound altogether. Although we're generally happy with the new keyboard, we mourn the loss of the power key (you can no longer switch on your Mac from the keyboard) and wish it shipped with a longer USB cable. Also, the keyboard retains the rubbery response of its Lilliputian predecessor; those accustomed to the feel of the old Apple Extended Keyboard may find the Apple Pro Keyboard a bit spongy.

The Pro Mouse is anything but spongy—it fits nicely in the hand and is very responsive—and you can adjust it to three different levels of resistance. With the mouse's optical tracking capabilities, you can dispense with your worn-out mouse pads; this mouse tracks well on just about any surface. We do wish, however, that Apple would reconsider its commitment to the single-button mouse. An operating system that supports contextual menus screams out for a two-button mouse, and once you've become accustomed to using a scroll wheel, it's hard to image going back to a wheel-less rodent.

Regrettably, the keyboard's power key and the additional mouse buttons aren't the only things missing from these new iMacs. Also absent is much of the software bundled with previous models. Gone are Brøderbund's KidPix Deluxe, Adobe's PageMill, and the World Book Encyclopedia. The DVD copy of *A Bug's Life*, included with previous versions of the iMac DV, has also disappeared. However, all iMac DV models include a copy of iMovie 2, Apple's entry-level video-editing application (★★★★½; *Reviews*, October 2000), along with AppleWorks 6, Intuit's Quicken Deluxe 2000, Smith Micro's FaxSTF 6, and the Pangea games Bugdom and Nanosaur.

Happily, DVDs play correctly on these iMacs, fixing the audio-sync problems of past models. Better yet, Apple has added a Theater mode, which increases brightness and color saturation in Apple DVD Player, iMovie 2, and QuickTime 4.1.2 and later.—CHRISTOPHER BREEN

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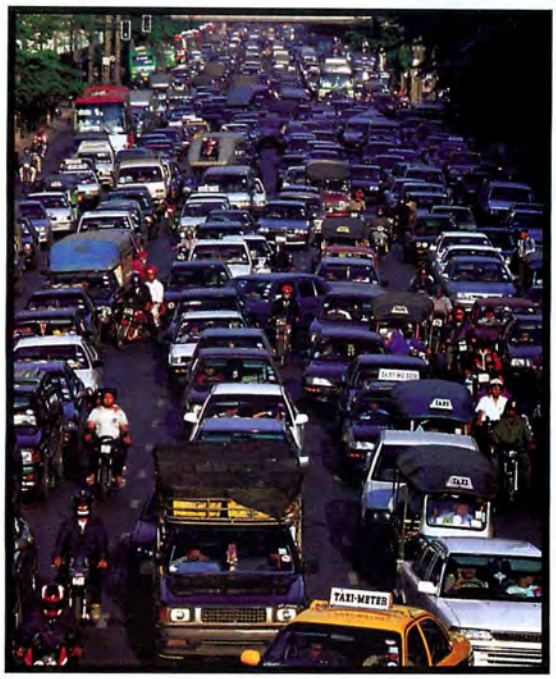
So many things in life are way too slow.



Your scanner shouldn't be one of them.

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FireWire

In the world of tedious traffic and all day meetings, we've invented something that won't slow you down. Our new FireWire/1394 scanners. They provide blazing fast scan speeds, up to twice as fast as a typical SCSI scanner. And with 3 models to choose from, there's something for everyone. The Astra 6400 features 600 x 1200 dpi resolution and 42-bit internal color. It includes terrific software like Adobe Photoshop LE and a FireWire/1394 PCI card for Windows PC users. The Astra 6450 has the same great features plus we've added a transparency cover for scanning transparent media. And for creative professionals, take note of the Powerlook 1100. It achieves a high 3.4 Dmax and 1200 x 2400 dpi resolution. You also get a transparency adapter with auto detect slide holders for auto cropping and batch scanning up to twelve 35mm slides at one time and a choice from our 6 software bundles.

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FireWire CD-RW Drives

Think You Can't Rewrite History? Seven Fast, Sleek Drives Will Make You Think Again.

QPS's Que FireWire 12×10×32× (left) and Que FireWire 8×4×32×

MACWORLD'S BUYING ADVICE:

Not surprisingly, the 12×10×32 FireWire CD-RW drives we tested are faster than the 8×4×32 drives. Of the faster drives, we like QPS's Que FireWire 12×10×32× drive best because of its low price and sleek design. For more–cost-conscious consumers, the similarly outfitted Que FireWire 8×4×32× drive finishes first, with a Retrospect backup speed twice that of competing 8×4×32 drives.

Macworld LAB TEST

Do you have a need for speed? Macworld Lab evaluated seven new FireWire CD-RW drives that should keep even the greediest speed demon happy . . . for a while, anyway. You can use any of these drives for backup and storage, as you would a standard CD-R drive, but they can also *rewrite* to your media. And since all the drives we tested take advantage of the IEEE 1394 interface, better known as FireWire, they're easier to set up than SCSI drives and speedier than their USB counterparts.

Our roundup includes four 12×10×32 drives: the EZQuest Boa FireWire 12× 10× 32×, the Fantom FireWire 12×10×32, and the QPS Que FireWire 12×10×32×, all built around a Plextor mechanism; and CD CyClone's CD Revo 12×10×32 FireWire, which uses a Sanyo mechanism. (The numbers indicate write, read, and rewrite speed, respectively.) All four rely on Sanyo's BurnProof technology, which Sanyo claims stops the dreaded buffer-underrun errors that occur when the burner stops receiving a consistent stream of data during a write session. BurnProof tells the mechanism to stop, wait for data, and then start writing again; it also lets you burn CDs in the background, freeing your computer to perform other tasks. No Mac applications currently support this technology, but the next version of Adaptec's Toast and Radialogic's upcoming CDMaster both promise to support it.

For those with more time than money, we've also included three 8×4×32 drives in our tests: the Plextor-based QPS Que FireWire 8×4×32× and the Matsushita-based EZQuest Boa FireWire 8× 4× 32× and LaCie CDRW 8×4×32×.

Test Drive

Macworld Lab put the drives through a series of real-world tests—copying from a CD to the drives and from the drives to a CD-R, erasing and copying to a CD-RW disc, and backing up data to a CD-R. The results were consistent with the drives' rated performance speeds, although some problems did surface.

The LaCie CDRW 8×4×32× exhibited erratic read performance. One

continues

ARNOLD TIOSEJO

"If someone tells you it takes only 5 minutes to install up to 240GB on the network, DON'T BELIEVE IT."

"I did it in 43.55 seconds."

Don Knisley, Network Engineer, US Air Force

Snap Servers are engineered for one purpose: file sharing. That's why Don could have a Snap Server 2000 up and running on a LAN in 43 seconds! "If I had the choice of installing an NT server for network storage or a Snap Server, I'd pick the Snap Server," says Don. "It's fast, easy and the browser configuration tool is very intuitive." Visit www.snapserver.com/install to read Don's story and virtually install a Snap Server yourself.

For a fraction of the cost of a file server, a Snap Server easily adds up to 240GB to your LAN – ideal for desktop publishing, multimedia production or as a graphics/image library. According to a recent PC Data report, 4 out of 5 workgroup network attached storage (NAS) servers sold are Snap Servers and they are also the most awarded NAS products on the market today. So go with the Industry Standard. Quantum Snap Server.

PC Feb. 2000 | Apr. 2000 | Apr. 2000 | A-LIST May 2000

Ease of Use
- Auto-sensing 10Base-T/100Base-TX Ethernet
- Automatic recognition of network types/clients
- Supports DHCP, BOOTP and RARP
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Features
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- Pentium-class processor
- Ultra ATA hard drives
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- Easily supports 100 or more clients

Compatibility
- Simultaneous support for Windows 2000, NT, NetWare, UNIX, Linux and Macintosh networks and clients across TCP/IP, IPX, NetBEUI and AppleTalk networks

Network Backup
- Compatible with Windows and NetWare backup software, including Veritas Backup Exec, Computer Associates ARCserveIT and Microsoft backup software for Windows 95/98/NT/2000

Network Security
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- Unconditional 30-day money-back guarantee, plus 3-year parts and labor

Price (MSRP)

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*Excludes set-up fee.

trial took 12 minutes; another, 6 minutes; and the next two trials, 10 minutes each. The CD Revo 12×10×32 had problems writing at high speeds with the default Toast memory settings; we had to set the cache manually to the recommended 24MB.

Another issue, unrelated to the drives themselves, had to do with confusing media specifications. The slower-rated drives couldn't recognize the 4×8×10×-capable CD-RW media from Verbatim and Yamaha. Verbatim said that although the discs are certified up to 10×, you can only use them in the new high-speed (8× or 10×) rewritable drives. So read the packaging carefully to ensure that the CD-RW media you buy is compatible with your drive.

The EZQuest Boa FireWire 8× 4× 32× and the LaCie 8×4×32× took five to six times as long as the 12×10×32 drives when backing up 600MB of data with Dantz Retrospect 4.3. That's because the Matsushita mechanism doesn't support continuous data streaming in packet mode, the mode Retrospect uses for backing up to a CD-RW drive. As a workaround, Retrospect slows the speed of the writers from 8× to 2×. The Que FireWire 8×4×32× drive backs up to CD-R media at 4×, half its rated CD-R speed but twice that of the other 8×-rated drives. One drive—the CD Revo FireWire, featuring the Sanyo mechanism—couldn't perform the backup test at all because Retrospect doesn't support it. CD CyClone is aware of the problem and is working with Dantz to fix it.

Keep in mind that you won't usually be performing backups during work hours, so speed may not be high on your list of priorities. That's why we weighted other factors—such as price, included media, design, carrying case, and software—more heavily when rating these drives.

In the looks department, the drives face the challenge of putting a sleek, Mac-like wrapper on a boxy, putty-colored drive. Only QPS's Que FireWire drives are putty-free and decked out in this year's hot graphite-and-white color scheme, and they even include a handy carrying case.—JAMES GALBRAITH

Neck and Neck

Macworld LAB TEST

Best results in bold. Shorter is better.

	600MB Copy to Hard Drive	600MB Write	600MB Rewrite
12×10×32			
CD CyClone CD Revo FireWire	222	**382**	471
EZQuest Boa FireWire	215	387	463
Fantom FireWire	**214**	397	466
QPS Que FireWire	245	385	**462**
8×4×32			
EZQuest Boa FireWire	**237**	**558**	**1098**
LaCie CDRW	762	560	1113
QPS Que FireWire	256	563	1105
	◀ Better	◀ Better	◀ Better

All scores are in seconds. We tested each drive using a Power Mac G4/500 with Mac OS 9, 128MB of RAM, a default system disk cache of 4MB, and virtual memory disabled. For the write and rewrite tests, we used Adaptec Toast 4.1.—**Macworld Lab testing supervised by James Galbraith**

FireWire CD-RW Drives Compared

COMPANY	PRODUCT	MOUSE RATING	LIST PRICE	MECHANISM	CONTACT	PROS	CONS
12×10×32							
CD CyClone Duplication Systems	CD Revo 12×10×32 FireWire	●●●	$479	Sanyo	949/470-4795 www.cdcyclone.com	Nice design.	Not supported by Dantz Retrospect; can't use Toast's default memory settings.
EZQuest	Boa FireWire 12× 10× 32×	●●●●	$449	Plextor	714/694-0031 www.ezq.com	Nice design; inexpensive.	Slightly larger footprint than others.
Fantom	FireWire 12×10×32	●●●½	$579	Plextor	310/474-1685 www.fantomdrives.com	Includes three CD-R discs.	Expensive.
QPS	Que FireWire 12×10×32×	●●●●½	$449	Plextor	714/692-5573 www.qps-inc.com	Nice design; includes carrying case; inexpensive.	None.
8×4×32							
EZQuest	Boa FireWire 8× 4× 32×	●●●½	$359	Matsushita	714/694-0031 www.ezq.com	Nice design.	Slow backup.
LaCie	CDRW 8×4×32×	●●●	$359	Matsushita	503/844-4500 www.lacie.com	Good documentation.	Slow backup; no included media.
QPS	Que FireWire 8×4×32×	●●●●	$349	Plextor	714/692-5573 www.qps-inc.com	Nice design; includes carrying case.	None.

Portable MP3 Players

Latest Players Offer FM Tuners, Slick Expansion Schemes, and More

Left to right: S3's Rio 600, I-Jam Multimedia's I-Jam, and Creative Labs' Nomad II

MACWORLD'S BUYING ADVICE:

It's great to see (and hear) a growing selection of Mac-compatible MP3 portables. The Rio 600 is the best of the three tested here, sporting an attractive design, the most legible LCD, and an innovative expansion scheme. It's also the least-expensive device and has the fastest transfer times. The Nomad II is a solid runner-up; its built-in FM tuner and voice recorder make it particularly versatile. The lowly I-Jam, burdened by a cryptic LCD, separate Jam Station hardware, and a weak FM tuner, finishes in last place.

The MP3 craze is transforming the way people buy, sell, steal, and play music—more and more music lovers are not only playing MP3 tunes on their computers but also taking their favorite tracks on the road with portable MP3 players.

Until recently, the selection of Mac-compatible MP3 portables has been sparse. Now, several portables are vying for your shirt pocket. We tested three: Creative Labs' Nomad II, S3's Rio 600, and I-Jam Multimedia's I-Jam. All three have unique strengths, but the Rio 600 is the pick of the pack.

Common Ground

All three players rely on USB for transfers from the Mac to the player's memory. But transfer speeds vary widely—in our tests, the Rio 600 handled transfers three times as fast as the Nomad II and more than four times as fast as the I-Jam player.

Each player includes Casady & Greene's SoundJam MP software for encoding MP3 tracks from your CDs and organizing them into playlists. After 14 days, the version of SoundJam MP bundled with the Nomad II and Rio 600 turns into a shadow of itself, disabling many features unless you pony up $19.95 (for the Rio) or $29.95 (for the Nomad II).

With the Nomad II and Rio 600, you use SoundJam MP to transfer tracks to the player and to delete them from its memory. The I-Jam appears as an icon on your Mac's desktop—you transfer and delete tracks using the Finder.

All three players let you adjust a track's bass and treble. Both the Nomad II and Rio 600 also have presets for common musical styles, but the Rio has the larger selection.

Memories Are Made of This

The amount of memory in an MP3 player determines how much music you can take with you. The Rio 600 contains 32MB of internal memory—enough to store about 30 minutes of near–CD-quality music (specifically, MP3 encoded at 128 Kbps). You can expand the Rio 600's memory by replacing the player's back cover with one that contains expansion memory. S3 calls this scheme a *backpack;* by the time you read this, a backpack containing 32MB of additional memory should be available. Another forthcoming backpack will contain a

SUZANNE ROADY

MP3 Players Compared

COMPANY	PRODUCT	MOUSE RATING	LIST PRICE	CONTACT	6MB FILE TRANSFER	PROS	CONS
Creative Labs	Nomad II	3½	$219 (32MB); $329 (64MB)	800/998-5227, www.nomadworld.com	36 seconds	Includes FM tuner and voice-recorder mode; good LCD display.	Bundled software requires upgrade to keep all features.
I-Jam Multimedia	I-Jam	3	$270	847/839-1233, www.ijamworld.com	50 seconds	Includes FM tuner; mounts on desktop.	Transfers require separate hardware; poor LCD.
S3	Rio 600	4	$170	800/468-5846, www.riohome.com	12 seconds	Innovative expansion scheme; easiest to use; excellent LCD display.	Bundled software requires upgrade to keep all features.

340MB IBM MicroDrive hard drive, which will accommodate more than five hours of 128-Kbps MP3 music.

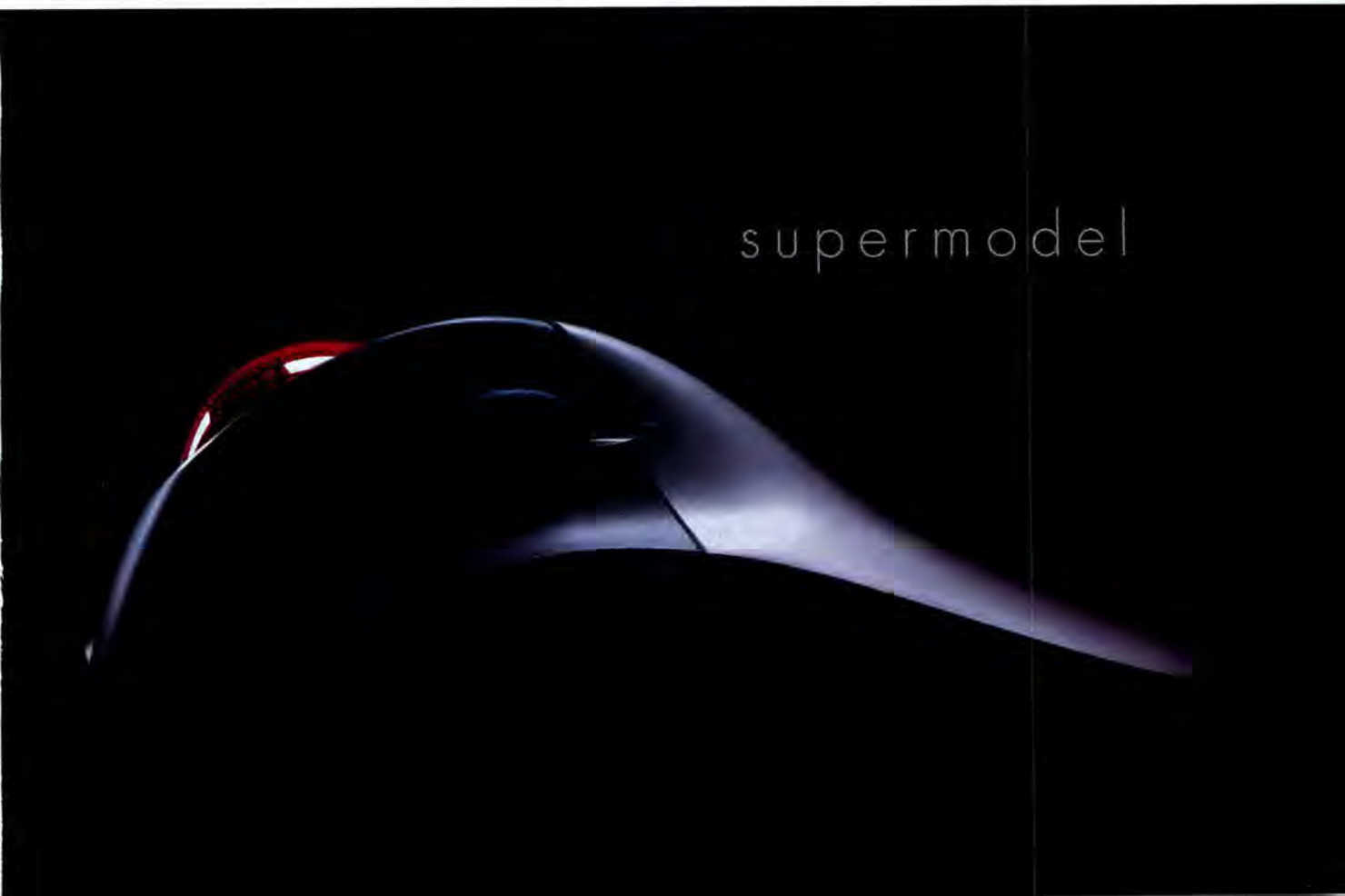
The Nomad II lacks internal memory, relying instead on flash-memory cards that slide into the player's battery chamber. Our review unit included a 64MB card, which sells for $199; a 32MB card sells for $89.

The I-Jam marches to its own memory beat, and it's not a very appealing rhythm. For starters, the player uses 16MB memory cards, giving it half the capacity of the competition. To transfer files, you must remove the memory card from the I-Jam and insert it into the included Jam Station flash-card writer, which is larger than the I-Jam itself.

Beyond the Basics

First-generation MP3 players were one-trick ponies, but the latest models go beyond just playing back MP3 tracks. The Nomad II and I-Jam players also contain FM radio tuners (an optional tuner for the Rio 600 has not yet been released). In our tests, the Nomad II did a better job of picking up weak stations. The Nomad II also has a unique voice mode for recording dictation. It's handy, but switching the Nomad II to voice mode requires a trip into the menu system, so it's not ideal for spontaneous note-taking.

Designing a user interface for a device that has a tiny LCD screen and minuscule buttons is a challenge, and the Rio 600 does the best job of meeting it. Its LCD shows more information than the other players about each track as it plays, and the display is attractive and easy to read.—JIM HEID



Web Animation Tools

Web-Banner–Design Programs

Pit Price against Function

E-PICTURE PRO 1.0

Rating: ♦♦♦♦

Pros: Solid Web animation tool; 3-D text; slicing tools.

Cons: Must open Export Wizard to see accurate playback; no export preview for some formats.

List price: $199

Company: Beatware, *650/556-7900*, **www.beatware.com**

WEBSHOCKER 2.0

Rating: ♦♦

Pros: Inexpensive; transition effects.

Cons: Not vector-based; uneditable text; limited export controls.

List price: $40

Company: RecoSoft, *info@recosoft.com*, **www.recosoft.com**

MACWORLD'S BUYING ADVICE:

Both beginners and advanced users will find WebShocker's tools more frustrating than useful for all but the simplest animations. Though e-Picture Pro is more expensive and still a little glitchy, it offers a solid set of tools with enough flexibility and power to create relatively complex animations.

To avoid being overlooked in the unsubtle world of online advertising, a banner must spin, flash, or fly. Web animation tools make it easier to build eye-catching ad banners, but the leading tools—such as Adobe Photoshop 5.5—cost upward of $600 and may be overkill for simple animations. Two less-expensive alternatives, Beatware's e-Picture Pro 1.0 and RecoSoft's WebShocker 2.0, prove you don't have to spend your life savings to create effective Web banners—but you do get what you pay for.

Under the Hood

Although e-Picture Pro and WebShocker focus on the same goal—quick, attention-grabbing animations—they differ at the most fundamental level. Like nearly every other Web-oriented graphics program, e-Picture Pro is vector-based; you can alter and resize paint strokes, lines, and snippets of text repeatedly without producing jagged edges. And e-Picture stores each object in an image separately, so you can manipulate one without affecting the rest of the image.

WebShocker, in contrast, produces bitmapped images whose pixels are applied permanently to the canvas. Even worse, the program doesn't separate its elements into layers, so selecting, editing, or deleting text, photographs, and drawn objects is difficult. This is a serious design flaw in a program designed to create images that shift and change over time.

Putting Graphics into Motion

In an improvement over its predecessor, e-Picture 1.0 (*Reviews*, February 2000), the current version adds a tool for creating 3-D text. You can define the color, lighting, depth, and rotation of text, which remains editable, and you can animate text along a path.

The program's animation tools are intuitive, if occasionally glitchy. Timeline and tweening tools let you simply specify an object's initial and final attributes; e-Picture Pro interpolates the transitions between the two frames. The program also has a useful visual tweening tool that displays the path an object will travel as you drag it into a new position. This makes fine-

Flying Logos With e-Picture Pro's new 3-D text tool, you can quickly create and animate 3-D logos.

tuning the speed and direction of an animation's movement easier.

You can view the animation at any time by clicking on the Play button in e-Picture's Animation palette, but the playback is jerky and—because the program must render each frame on-the-fly—bears no relation to the speed of your final output. To get a realistic look at your animation, you have to open the program's Export wizard, wait for the program to load all the frames, and then click on Play.

WebShocker takes a different approach to animation. Instead of using a timeline, the program requires you to build animations one frame at a time. Since there's no easy way to select objects and make minor adjustments from one frame to the next, this often requires starting from scratch each time. Fortunately, WebShocker's onion-skinning feature helps you line up elements in different frames. And a library of transitions—the closest thing the program has to tweening—lets you add canned effects.

Importing and Exporting

You can now import native Photoshop and Illustrator files to e-Picture Pro, preserving objects' layers and editability, and distribute the layers as an animated sequence or as separate bitmaps. WebShocker also imports native Photoshop files, but it does a decidedly clumsy job of handling layers—which it separates and places randomly on individual frames. Additionally, the program can't interpret vector information (including text) from Photoshop 5.0 or 5.5.

The most useful addition to e-Picture Pro comes into play when you're ready to export your animation. The Image Slicing tool lets you cut animations into pieces, which you can then optimize and export separately for quicker downloads. By breaking a large, complex animation into individual elements, you could combine a QuickTime movie, a JavaScript roll-over, and a looping, animated GIF into what appears to be a seamless animation.

For Web banners, minimal file size can be as important as image quality. Both e-Picture Pro and WebShocker offer Export wizards that let you preview and compare your final output and file size under a variety of compression options. Both programs export files as animated GIFs, JPEGs, and QuickTime movies; e-Picture Pro also exports in SWF and RealVideo (although you can't preview the final output in these formats from the Export wizard). WebShocker's Export wizard has its own problem: you can't zoom in on the tiny previews, making it all but impossible to tell what effect your changes are having on the image.—KELLY LUNSFORD

iMaxpowr G4

G4 Upgrade for Original iMacs Is Fast but No Miracle Worker

Macworld LAB TEST

iMAXPOWR G4

Rating: ★★★½

Pros: Faster performance, most notably in Velocity Engine–enhanced applications.

Cons: Expensive; installation problem with one of our test units.

List price: $699 (less $150 rebate)

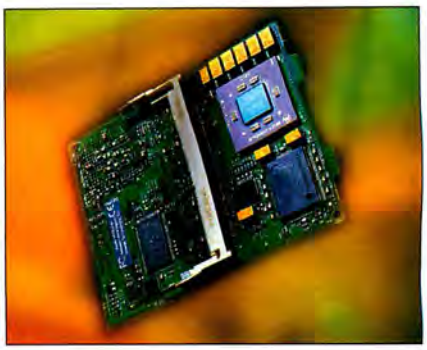
Company: Newer Technology, 316/943-0222, **www.newertech.com**

MACWORLD'S BUYING ADVICE:

Although the iMaxpowr upgrade offers noticeably better performance in everyday computing tasks, unless you're running an application that benefits from Apple's Velocity Engine technology, you won't see a breathtaking difference. If you don't depend on such enhanced applications, the $499 (before $150 rebate) iMaxpowr G3 (★★★★; *Reviews*, July 2000) is a much better deal.

The CPU may have the most influence on a computer's overall performance, but this isn't the only factor that determines how quickly your Mac runs. While a processor upgrade will certainly speed up a Mac, it won't make your machine as frisky as a new Mac with a faster system bus and higher-performance video circuitry. Newer Technology's 433MHz iMaxpowr G4 offers a case in point. This upgrade increases the overall performance of the iMac's first four revisions and turns in Speedmark 2.0 scores nearly 50 percent faster than those of a 233MHz Rev. A iMac. Unfortunately, the iMaxpowr can't match the overall performance of a 400MHz Power Mac G4 because of the bottlenecks inherent in the original iMac's bus speed and poky video circuitry.

Because Photoshop takes advantage of the Power Mac G4's Velocity Engine technology, our iMaxpowr G4–equipped Rev. A iMac fared far better than the same iMac with its original 233MHz G3 processor. Yet the 400MHz Power Mac G4 performed better still, thanks to its faster bus speed and video card. The iMaxpowr's extra 33MHz did pay off in our SoundJam encoding test, however; the iMaxpowr-equipped iMac bested the Power Mac G4 by 7 seconds. And as you would expect—since 3-D gaming performance relies more on the graphics chip than on the processor—the iMaxpowr iMac produced a scant 2.6 frames per second in our Quake III test, compared with the Power Mac G4's 34.5 frames per second.—CHRISTOPHER BREEN



GIBSON

Upgrade Card Revs Up Older iMacs

Macworld LAB TEST

Best results in bold. *Reference systems in italics.* Shorter is better. Longer is better.	SPEEDMARK 2.0	QUAKE III	PHOTOSHOP 5.5				SOUNDJAM
			Gaussian Blur	Unsharp Mask	RGB to CMYK	Lighting Effects	MP3 Encode
iMaxpowr G4/433	82	2.6	34.8	31.1	35.5	31.1	**1:52**
Apple iMac/233	*58*	*2.2*	*50.3*	*48.7*	*53.3*	*72.9*	*5:40*
Apple Power Macintosh G4/400	***133***	***34.5***	***20.6***	***19.3***	***27.5***	***20.3***	*1:59*
	Better ▶	Better ▶	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better

Speedmark 2.0 scores are relative to those of a 350MHz iMac, which is assigned a score of 100. Adobe Photoshop results are in seconds. SoundJam results are in minutes:seconds. Quake III results are in frames per second. We tested each system with Mac OS 9.04, 128MB of RAM, a default system disk cache of 4MB, and virtual memory enabled for all tests except SoundJam. We set displays to 1,024 by 768 pixels and 24-bit color. We performed Photoshop tests with a 50MB file; we set Photoshop's memory partition to 80MB and Photoshop History to Minimum. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds in length and converted it using a default setting of 128 Kbps in SoundJam 2.2. Speedmark is a suite of common tasks (see www.macworld.com/speedmark).—**Macworld Lab testing supervised by Jim Galbraith**

USB KEYBOARD GROWS UP

Apple Pro Keyboard

APPLE PRO KEYBOARD

Rating: ♦♦♦½

Pros: Gorgeous; same layout as the Apple Extended Keyboard; volume and eject keys.

Cons: No power key; short cord.

List price: $59

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

MACWORLD'S BUYING ADVICE:

You won't find a better-looking keyboard than the Apple Pro. As long as you don't mind the missing power button, it's definitely worth considering if you're looking for a replacement USB keyboard for your Mac.

Ever since my faithful Apple Extended Keyboard succumbed to years of hard pounding and soda spills, I've barely tolerated the keyboard that shipped with my G3 Power Mac. Although I welcomed the extra few inches of desk space, I hated fumbling with the keyboard's tiny function and cursor keys. Apple's Pro Keyboard, which ships with all new desktop Macs and is also available separately, remedies the deficiencies of the older version and adds a few handy features.

The Pro Keyboard sports full-size function keys and an inverted-T arrow-key arrangement that makes zipping around spreadsheets a snap. Three new keys at the top of the numeric keypad let you raise, lower, or mute your Mac's sound; a fourth key ejects the disk from your CD or DVD drive.

Apple didn't include a power button on the keyboard, oddly enough, so you have to reach for the power switch on your computer to turn it on. And as with the standard G3 keyboard, the cable isn't long enough if you keep your Mac under your desk.—FRANKLIN N. TESSLER

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Commotion 3.0

Top-of-the-Line Rotoscoping Tool Adds Powerful Compositing Features

COMMOTION 3.0

Rating: ♦♦♦♦½

Pros: Project-based interface for rotoscoping and compositing; excellent selection of effects.

Cons: Minor interface flaws.

List price: $1,995

Company: Pinnacle Systems, *888/484-3366,* **www.pinnaclesys.com**

MACWORLD'S BUYING ADVICE:

Commotion's new interface improves an already powerful and unique product. In addition to facilitating smoother workflow, Commotion's new compositing facilities mean you'll spend less time moving between Commotion and a compositing or editing program such as Adobe After Effects or Apple Final Cut Pro. If you're looking for powerful rotoscoping and compositing, Commotion 3.0 is for you.

Rotoscoping is the art and science of painting directly on individual frames of a piece of film or video to create special effects, and there's no better tool for rotoscoping on the Mac than Pinnacle Systems' Commotion. Recently upgraded and completely rewritten, Commotion sports features that not only allow for new types of effects but also greatly change the way the program fits into a production workflow.

Pictures at a Composition

As previous versions do, Commotion 3.0 lets you load QuickTime clips into RAM for full-screen, full-motion playback. But where previous versions opened and manipulated QuickTime movies directly, version 3 includes a complete project-management interface that lets you edit nondestructively and take advantage of a full range of compositing effects.

Adobe After Effects users will feel comfortable with Commotion's Project and Composition windows, which support unlimited layers and provide full keyframe control over properties such as position, scale, rotation, and opacity.

If you're outputting to a FireWire-based DV system, you can now preview your video on an NTSC monitor from within Commotion; you don't need to move video into an editing package to watch it at full resolution.

The Right Tool for the Job

Commotion has always had excellent real-time painting tools, but version 3's rewritten painting engine makes them even better. This version's paintbrush tools offer improved subpixel rendering and a more comfortable feel. The 75 new effects filters include Pinnacle's Primatte Keyer, Composite Wizard, and Image Lounge packages. The powerful cloning facilities now allow you to clone from one frame to another, and the automatic wire-removal brushes and natural-media effects tools remain excellent.

With the program's new project-management tools comes a new approach to painting. You can now paint directly into an individual QuickTime movie or into a composite of several movies. And a streamlined palette and set of controls make the Motion Tracking feature a little less cumbersome to use.—BEN LONG

Guess Who's Coming to Dinner Commotion 3.0's project-management interface allows complex compositing, improved workflow, and easier revisions.

TWO-MEGAPIXEL CAMERA SERVES UP PLEASING IMAGES, FITS IN A POCKET

Canon PowerShot S100 Digital Elph

CANON POWERSHOT S100 DIGITAL ELPH

Rating: ♦♦♦♦

Pros: Compact; pleasing image quality.

Cons: Expensive.

List price: $699

Company: Canon, *800/652-2666*, **www.usa.canon.com**

MACWORLD'S BUYING ADVICE:

The Canon PowerShot S100 Digital Elph can't match the Nikon Coolpix 950 for crisp, clean images, but its compact size and good image quality make this camera a worthy competitor.

Three-megapixel cameras are all the buzz, but there's no shortage of new two-megapixel models that merit a look. We recently reviewed five of the latest offerings (see www.macworld.com/2000/07/19/reviews/cameras.html), the most noteworthy being the Canon PowerShot S100 Digital Elph. Built on Canon's popular Elph (an APS film camera), the Digital Elph is lightweight and small enough to fit in the palm of your hand or in your shirt pocket. A small size doesn't mean a small feature set, however: you get 2× optical zoom and 4× digital zoom, a built-in flash, a bright LCD monitor, USB connectivity, and a complete set of menu functions.

We compared the Digital Elph with the Nikon Coolpix 950, whose standout picture quality and ergonomic features set the standard for two-megapixel cameras last year. Like the Coolpix, the Digital Elph produced images with good skin tone and color fidelity. However, they did exhibit noticeable levels of noise.

The Digital Elph includes a proprietary Canon battery and recharger; the battery requires between 90 minutes and 2 hours to charge. Our tests showed that a fully charged battery will let you take dozens of shots. The Elph stores images on an 8MB CompactFlash card, but you can upgrade to a card that holds as much as 192MB.—RICK OLDANO

Circle 63 on card or go to www.macworld.com/getinfo

INEXPENSIVE AUTHORING PROGRAM CREATES QUICKTIME-BASED SLIDE SHOWS

LiveSlideShow 1.0

LIVESLIDESHOW 1.0

Rating: 3½

Pros: Simple interface; inexpensive; bandwidth-friendly transitions.

Cons: Limited audio capabilities.

List price: $29.95

Company: Totally Hip, *888/884-3447*, **www.totallyhip.com**

MACWORLD'S BUYING ADVICE:

LiveSlideShow is easy to use yet powerful enough to create interactive educational slide shows, electronic brochures, or fun alternatives to online photo albums. Its approach to sound limits your options, but you can't complain too loudly given its bargain price. This is a program you can learn in an hour and have fun with for months.

Say you have some digital-camera images you'd like to post on the Web, but you want to go beyond a boring online photo album. Check out Totally Hip Software's LiveSlideShow 1.0. Based on Apple's QuickTime, this program lets you create slide shows complete with transitions between images, text captions, sound effects, and interactive navigation buttons. Despite a few rough edges, it's a fun and surprisingly powerful application.

The iMovie Influence

If you've used Apple's iMovie, LiveSlideShow will feel familiar: a shelf holds imported images and sounds, a timeline enables you to sequence images, and a preview area lets you see your work in progress.

With the Effects panel, you can add transitions between images. Adding effects is a cinch: drag the desired effect between two slides in the timeline, and they part to make room for it. LiveSlideShow uses QuickTime to generate effects as the slide show plays back, so they don't bloat your file's size (as they would if you were to create them in a video-editing program such as iMovie). You can also add text captions to each slide, complete with optional anti-aliasing, drop shadows, and a variety of (mostly tacky) animation styles.

DiskWarrior® has
than

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

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

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

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

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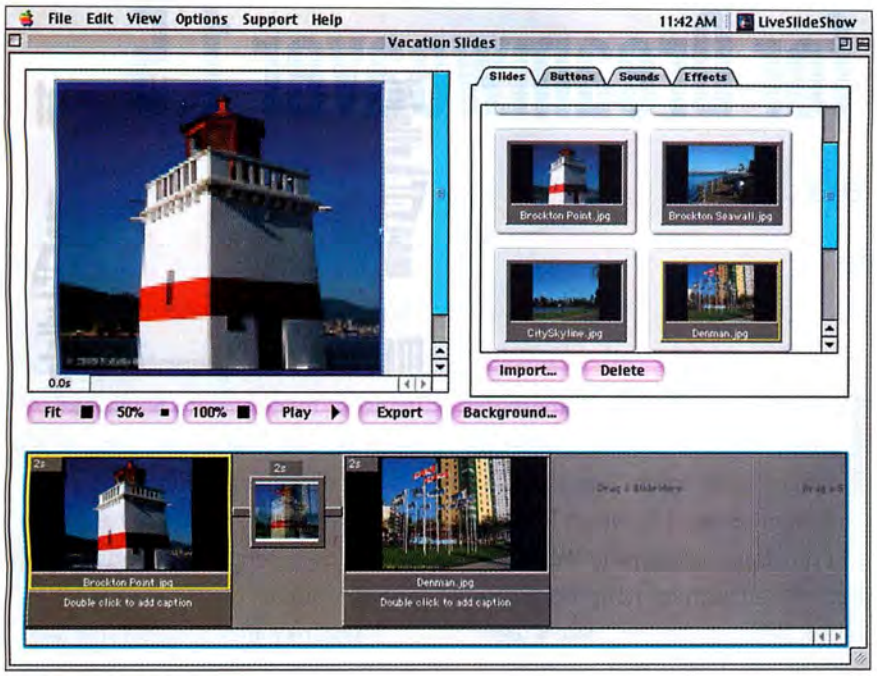

Making a Slide Show LiveSlideShow's iMovie-like interface makes creating QuickTime slide shows easy—just drag sounds and images into the timeline.

LiveSlideShow can import most QuickTime-supported audio file formats, including AIFF and MP3, and you can record short narration snippets directly within the program. Unfortunately, LiveSlideShow attaches sounds to individual slides—if a sound is five minutes long, the corresponding slide displays for five minutes as well. This approach makes it impossible to have one soundtrack play while slides change.

LiveSlideShow's interactivity features are rudimentary but useful. You can add buttons to individual slides; when clicked on, these buttons can take viewers to the next or previous slide or to the slide show's beginning or end, play a sound, or direct a viewer's browser to a Web page.

You can test your work by clicking on the Play button. When you're happy with the results, click on the Export button to create a standalone QuickTime movie you can embed in a Web page, burn onto a CD, or send via e-mail. Any Mac or Windows program that can play QuickTime movies can play LiveSlideShow projects.—JIM HEID

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Lasso Studio for Dreamweaver 1.5

The Easiest Way to Create a Database-Driven Web Site

LASSO STUDIO FOR DREAMWEAVER 1.5

Rating: ♦♦♦♦½

Pros: Makes implementing basic search tasks easy; SiteBuilder provides templates for typical cases; extensible to complex SQL databases.

Cons: Fairly tough transition to general ODBC databases.

List price: $349; downloadable version, $299

Company: Blue World Communications, *425/646-0288*, **www.blueworld.com**

MACWORLD'S BUYING ADVICE:

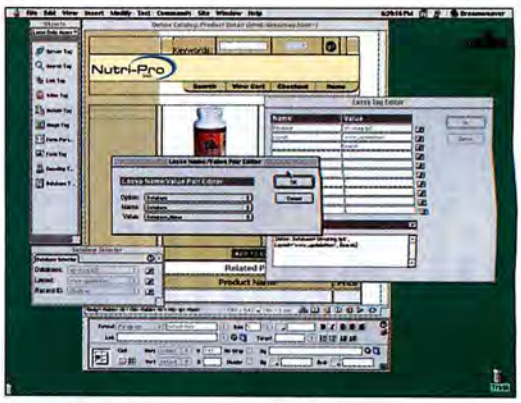
Lasso Studio offers Dreamweaver users a nearly ideal way to put a business product catalog on a Web site. Version 1.5 refines the code converters and Configuration Wizard of 1.0 but retains the dead-simple Lasso graphical approach.

If you think creating a database-driven Web site requires hard-core coding, think again. Lasso Studio for Dreamweaver 1.5, which lets you add database functions to Web sites, is simple enough for nonprogrammers to use. Without altering Lasso's user-friendly visual programming style, Blue World Communications has beefed up the latest version and made it even easier to use. New features include SiteBuilder, a convenient set of templates for adding database search functions, and Database Selector, which makes working with multiple databases a matter of a few wizard choices.

After installation, you access Lasso commands from within Dreamweaver. Lasso's straightforward LDML tags work with the included server-side application, Lasso Web Data Engine, which controls data flow between a Web server, database, and Web client. (Lasso comes with a Lasso Web server but works with all common Mac server software.)

Lasso functions quite elegantly. The upgraded Lasso Configuration Wizard identifies your database and its records and fields. To create a database search page, you choose fields from the FormBuilder dialog box rather than hand-coding tags. Dreamweaver's Object palette includes several Lasso programming icons for manipulating fields and records. The SiteBuilder function is a bit of a misnomer, though: you'll use Dreamweaver to build sites and SiteBuilder's templates to add search pages to them.

Lasso requires considerably less database experience than other popular Web-database solutions such as Pervasive Software's $495 Tango 2000 (♦♦♦♦; *Reviews*, September 2000) or 4th Dimension's 4D Server. Lasso also handles any ODBC-compliant database, but you can expect to do more work if you range beyond FileMaker and 4D. You can embed SQL queries into Lasso Web pages or rely on Lasso's built-in LDML-to-SQL translation. And Lasso pays meticulous attention to security, letting you define security levels for individual users at database, record, and field levels.—CHARLES SEITER



Visualize This Lasso Studio for Dreamweaver's visual programming environment lets you see how your forms will look in a Web browser—as you create them in Dreamweaver.

More Info: www.apple.com/guide

To get an idea of the scope of Lasso Studio for Dreamweaver, check out Apple's product guide, programmed in Lasso.

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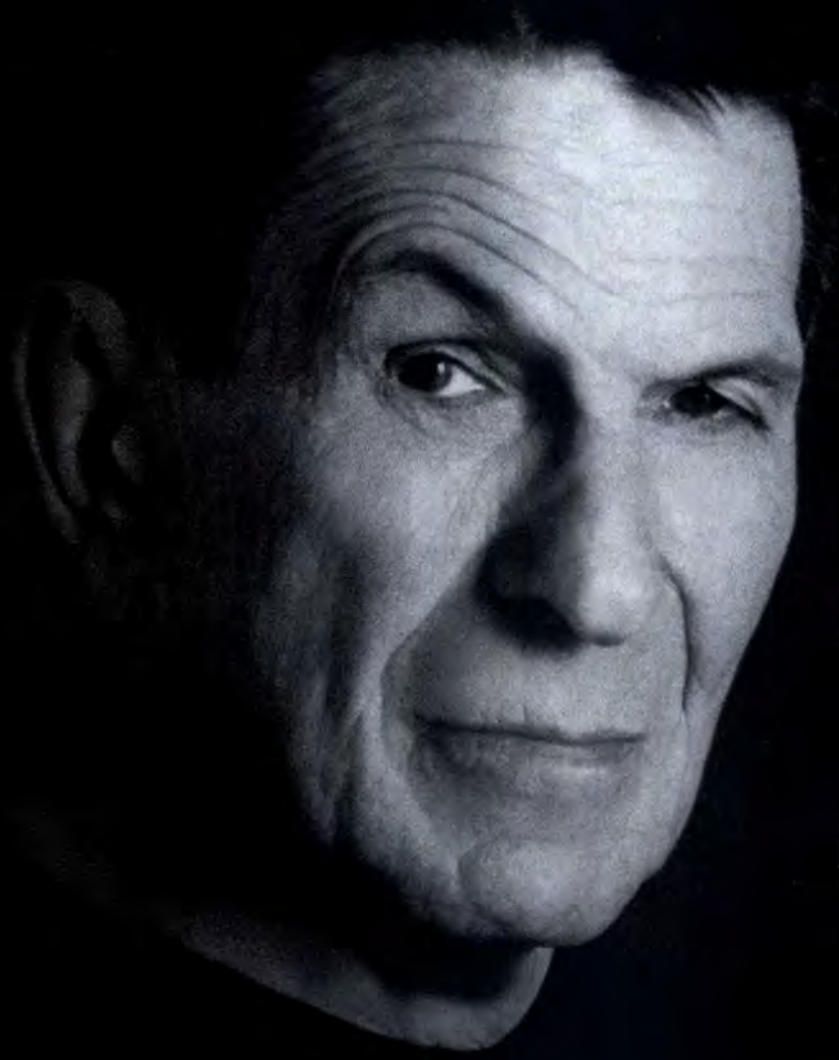

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ADAPTER RESURRECTS LEGACY PRINTERS

PowerPrint USB 5.0

STEPHEN SUGG

Rating: ★★★★

Pros: Supports any parallel-port printer; transparent to applications; supports scanning on multifunction printers.

Cons: Expensive.

List price: $99

Company: Infowave, *800/463-6928*, **www.infowave.com**

Macworld's Buying Advice: If you have a parallel-port printer and a Mac that's yearning to talk to it, PowerPrint USB 5.0 is an easy—albeit expensive—solution.

The latest Macs lack the serial printer port that has been the mainstay of printer attachment since 1984, leaving owners of new Macs and old-style printers in limbo. Infowave offers a solution in the form of its PowerPrint USB 5.0 adapter and software. By adding a parallel printer port to USB Macs, PowerPrint brings Mac-compatible printers with both serial and parallel ports back to life.

Installation is simple: load the software, connect the USB-to-parallel-port cable to your printer, and print to your heart's content. The only downside is the $99 price tag: for about the same price, you can buy a brand-new USB ink-jet printer.—MEL BECKMAN

AT LAST, A BIG-NAME LINUX FOR THE MAC

SuSE Linux 6.4

Rating: ★★★½

Pros: Good installer; four CDs of software; comprehensive manual.

Cons: PowerPC updates lag behind 80x86 updates; sloppy manual.

List price: $50

Company: SuSE, *888/875-4689*, **www.suse.com**

Macworld's Buying Advice: Although Linux remains an OS for the technically inclined, SuSE Linux 6.4 provides the best installation experience and the largest software collection of any PowerPC Linux distribution.

If you're looking for a Linux to install on your Mac, SuSE is the first big name in the Linux world to release a distribution for PowerPC-based machines. SuSE Linux 6.4 provides all the features of a seasoned Linux distribution, such as a solid, well-regarded installer. Those who have used SuSE Linux for other processors will feel right at home with the Mac version. The downsides are that the manual is riddled with typos and suffers from translation problems, and that SuSE's kernel updates for PowerPC lag behind updates for 80x86.

That said, SuSE Linux for PowerPC—with its library of software and printed manual—offers by far the best Linux distribution for its price.—STEPHAN SOMOGYI

SPEAKERS LOOK COOL, SOUND GREAT

SoundSticks

Rating: ★★★★½

Pros: Unique design; great sound; works with most newer Macs.

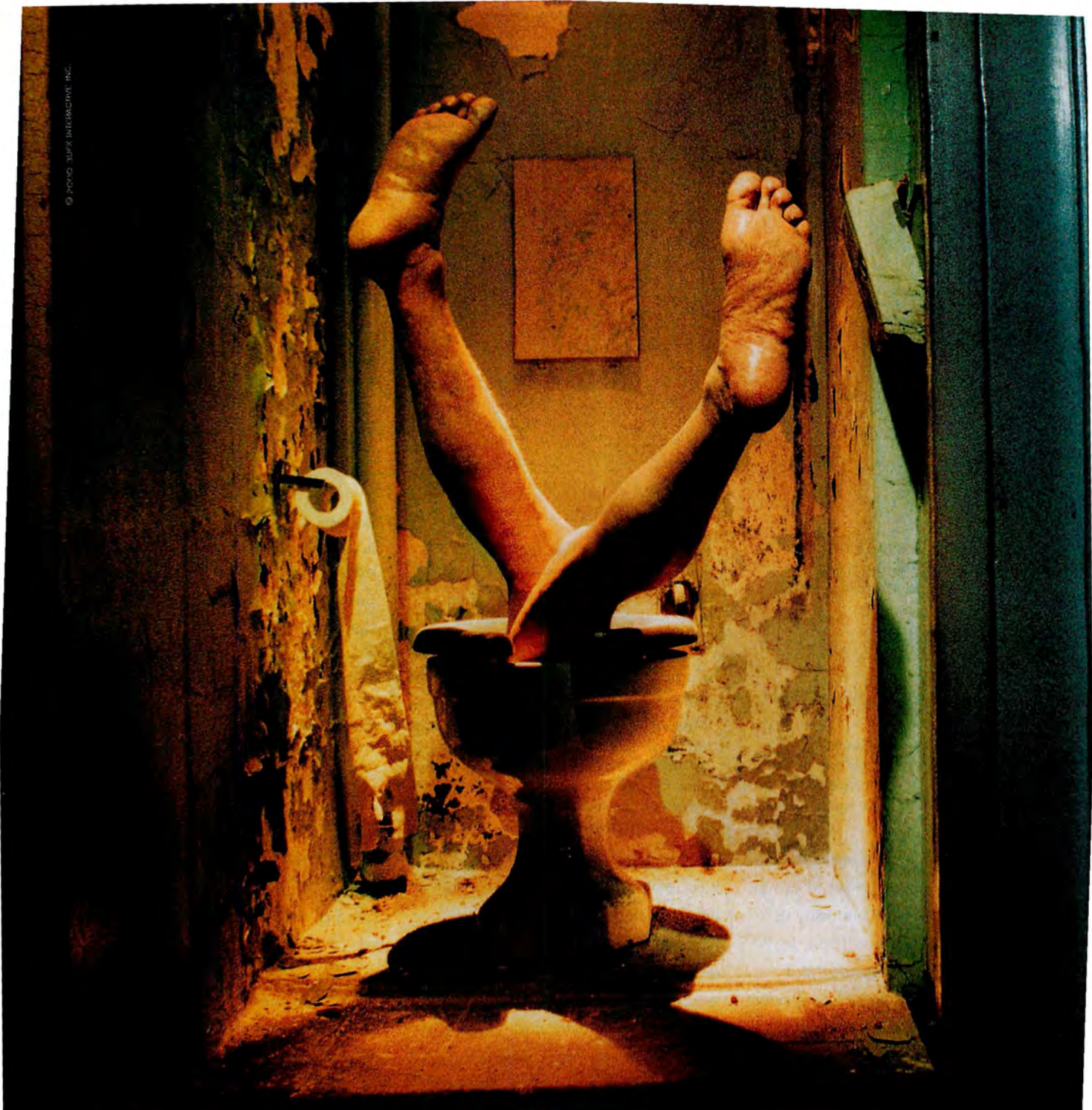
Cons: No volume control on satellites.

List price: $199

Company: Harman Multimedia, *818/893-8411*, **www.harman-multimedia.com**

Macworld's Buying Advice: The SoundSticks speaker system is really worth its salt. The combination of great sound and cool design makes it a natural addition to your already stylish Mac.

Harman Multimedia's SoundSticks picks up where its predecessor, the iSub (★★★★; www.macworld.com/2000/04/07/isub.html), left off. In addition to a subwoofer—the component that pumps out deep, gut-shaking bass—the system comes with two tiltable 10-watt satellite speakers, for a total of 40 watts of power. The bass module has its own volume knob, but you need to adjust the overall volume of the Sticks via your Mac's Sound control panel or through the Control Strip. With a frequency range comparable to that of a home stereo, the SoundSticks system makes a great addition to any Mac with built-in USB running at least Mac OS 9.0.4.—JONATHAN SEFF



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UTILITY HELPS YOUR INK-JET SPEAK POSTSCRIPT

StyleScript 5.0

Rating: ♦♦♦

Pros: Works as advertised.

Cons: Limited printer support; Mac OS 9 conflict; slow.

List price: $99

Company: InfoWave Imaging, 800/663-6222, **www.strydent.com**

Macworld's Buying Advice: StyleScript 5.0 does a good job of producing PostScript files on a limited range of ink-jet printers. Printing is slower than with the native driver, however, and there's a conflict with Mac OS 9's Multiple Users feature.

Inexpensive ink-jet printers keep raising the bar on image quality, but they still don't speak PostScript, the Adobe page-description language that's necessary for producing clean EPS files. Enter StyleScript, a utility that converts Hewlett-Packard's DeskJet 1120C and Epson's Stylus Color 740, 740i, 760, 860, 900, 900N, 900G, and 1160 into PostScript 3 output devices. In our tests, StyleScript produced a clean, non-jaggy EPS file from QuarkXPress, though printing took up to twice as long as with the native driver. And the software didn't work when Mac OS 9's Multiple User feature was enabled, a conflict that's mentioned in the PDF documentation. Otherwise, installation went without a hitch.—STEPHEN BEALE

GET EASY ACCESS TO STREAMING BROADCASTS

Aladdin Tuner 3.0

Rating: ♦♦♦

Pros: Simplifies finding streaming content; inexpensive.

Cons: Poor search feature; some interface glitches.

List price: $29.95

Company: Aladdin Systems, 831/761-6200, **www.aladdinsys.com**

Macworld's Buying Advice: You don't need Aladdin Tuner 3.0 to enjoy the global racket of streaming media, but this program makes finding live streaming content a lot easier.

If you enjoy listening to live streaming media, check out Aladdin Tuner 3.0, an update to a program previously called MacTuner (*Reviews*, September 1999). Aladdin Tuner includes a list of more than 3,400 radio- and TV-station Webcasts (automatically updated whenever you launch the program). Use its maps to find a station, and then double-click on a station to launch your streaming player. Aladdin Tuner supports RealNetworks' RealPlayer, Apple's QuickTime Player, and Microsoft's Windows Media Player.

Aladdin Tuner isn't without flaws: its interface is sometimes awkward, and its search feature often failed to find stations I knew were in its database.—JIM HEID

PEOPLE SIMULATOR PUTS YOU IN CONTROL

The Sims

Rating: ♦♦♦♦½

Pros: Addictive; entertaining; lush sound effects.

Cons: Can't venture beyond local neighborhood; Sim children never grow up.

List price: $49.95

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

Macworld's Buying Advice: The Sims is one of the most compelling games to hit the Mac in years. The next time someone tells you to get a life, get The Sims instead.

Picture a reality-TV show where *you* tell everyone what to do, and you have the basic premise behind The Sims. From an overhead perspective that lets you monitor all the goings-on in a simulated household, you shepherd your charges though their daily lives—from going to the bathroom to taking out the trash. You're responsible for making sure everyone's physical and emotional needs are met, but since Sims speak only gibberish, you have to watch for nonverbal cues such as gestures and groans. If you're not careful, your Sim's life can turn nasty in short order; do things right, and you may soon have another Sim to care for.—FRANKLIN N. TESSLER

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DEVILISHLY DELIGHTFUL, ACTION-PACKED SEQUEL

Diablo II

Rating: ♦♦♦♦½

Pros: Vast levels; expanded and diverse characters.

Cons: Weak Save feature.

List price: $60

Company: Blizzard Entertainment, *800/953-7669*, **www.blizzard.com**

Macworld's Buying Advice: Diablo II is a terrifically entertaining game with only one drawback: the Save feature occasionally forces you to revisit areas you've already trod and face defeated enemies again. If you liked Diablo, you'll love Diablo II.

Blizzard Entertainment seems incapable of turning out a bad game. Witness Diablo II, a sequel that not only provides an extra dose of the original Diablo's hellish good fun—including a more expansive collection of adventures and a larger cast of protagonists—but also corrects the annoyances of its predecessor. As Diablo players know, locating goodies in a dark dungeon is problematic; walls and bodies often conceal items. Diablo II helps you out by listing all procurables on screen when you press the option key. Also, holding down the mouse button now causes your hero to attack repeatedly, and you can emphasize skills that help your character carry the day.—CHRISTOPHER BREEN

DISAPPOINTING VERSION OF TV PHENOMENON

Who Wants to Be a Millionaire Second Edition

Rating: ♦♦½

Pros: Mirrors the TV show.

Cons: No networked play; staid graphics.

List price: $20

Company: Buena Vista Interactive, *800/900-9234*, **http://bvinteractive.go.com**

Macworld's Buying Advice: The fiercest *Millionaire* fanatics will buy and enjoy this game regardless of its flaws; others will be better off saving their pennies for a more dynamic trivia game.

The awesome power of Regis Philbin continues to spread unabated, from daytime TV to prime time and now, with the release of Who Wants to Be a Millionaire Second Edition, to the Mac. Hard-core fans will be pleased that the computer version retains the look-and-feel of the televised game, right down to the mind games Regis plays with doubt-riddled contestants.

But aside from a few nice touches, Millionaire falls flat. If multiple players want to take on Regis, for example, they have to crowd around the keyboard. And although the game's graphics nicely re-create *Millionaire*'s futuristic set, the empty chairs become a little boring. As a result, Millionaire doesn't hold up well with repeated play.—PHILIP MICHAELS

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♦♦♦½ **Apple Studio Display (15-Inch Flat-Panel)**
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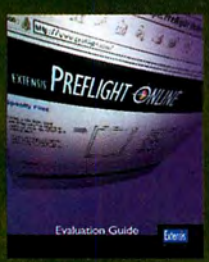

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ANDY IHNATKO

The Game Room

Recently I've been contemplating my Steel Ruler of Righteousness and trying to decide if it isn't time for me to mete out a little wrath. I try not to use the Ruler unless a situation really screams for it—for example, when I encounter a movie director who believes that if he throws in that effect from *The Matrix* or films the action sequences in John Woo–style slow motion, I won't notice that his movie totally sucks. Imagine my dilemma after I saw *Mission: Impossible 2*.

When I think about game cheats, my eyes flicker to the Ruler's rosewood presentation case. I wonder what effect a few well-placed swings would have on individuals and agencies that ain't halfway near as moral as I. The whole tenor of cheating is starting to change, and we're at the point where it might start to affect gaming as a whole.

In gaming, the path from newbie to elite is a well-worn one. At first, the goal is to master a game through dedication, determination, and the balanced and thoughtful application of intellect, fast-twitch skill, and lateral thinking. Then it's time to learn little cheats that, while perhaps not in keeping with the spirit of the original challenge, aren't necessarily immoral. Then we swing straight into breaking the rules and blatantly tampering with the very conditions under which the competition was originally designed, pulling a *Kobayashi Maru* (he said, following that up with an overly defensive assurance that *Star Trek II* was the only Trek film he actually liked).

Finally, we end up so addicted to the tampering that we declare that cheating is part of the game, a feature that elevates us to an entirely higher level of play. Cheating is merely a way to separate the Determined Winners from Those Who Will Lose Eventually. All along we've been telling our parents that gaming helps us develop important and useful skills such as deductive reasoning and long-term planning. Who knew it was also teaching us the fundamentals of modern American business?

Cheating is seductive, I'll grant you. After all, cheat codes are wired into nearly every game under the sun. What was originally an exciting secret—that the programmers had accidentally left in a debugging feature that could grant the player infinite life and power, say—became part of marketing. A few examples:

In Carmageddon 2, stopping your car and typing **MINGMING** instantly repairs all damage. **STICKYTYRES** gives your car the ability to climb walls, and typing **TAKEMETAKEME** Kevorkian-izes all the pedestrians, making them run straight into your path.

In Railroad Tycoon 2, hit the tab key and type **POWERBALL**, and your company will get $100 million. **AMTRAK** *deducts* a million bucks. (Why are they picking on Amtrak? Don't they know that there are now standard AC outlets at every seat?) **CASEY JONES** will cause all trains but yours to crash.

In Unreal Tournament, open the console and type **IAMTHEONE** to activate game cheats. **ALLAMMO** gives you all available ammunition, **GOD** makes you invincible, and **KILLPAWNS** does a *Kaijû Sôshingeki* (or "Destroy All Monsters," for those few of you who don't watch Godzilla movies in Japanese).

continues

Do these things even count as cheats? A more open-minded way of looking at cheat codes is to think of them as *equalizers*. Just as my 52 handicap theoretically allows me to play golf against Tiger Woods, cheats allow a 4.0 student to compete against a roommate who apparently went to college to major in first-person network shooters.

Then there are patches, which are one level up from cheats in terms of weaseliness. After all, cheat codes reflect the intent of the folks who designed the game. The designers certainly didn't intend for clever boys and girls to pore over the game's resources and source code—and monkey-wrench brand-new cheats of their own by changing a few numbers around. Instead of initializing your character at the bottom of the power scale, you start off every new game as the Sinatra of that universe, through hacks to your saved games or the game application itself.

Most folks patch their games by exploiting a hack that's already been tried and tested: tiny patch apps, which litter major download sites. But installing a patch is like using a bus-station drinking fountain. You have no idea of what's ultimately gonna result from it.

"Version 1.0 of this patch ultimately breaks your USB drivers," you'll read on Usenet the day after you download it. "If you haven't installed it yet, don't; if you have, don't you wish you'd actually read the Terms of Use agreement before clicking on Agreed?"

It's an extremely touchy subject with developers. Some are good-natured about it, viewing the development of game patches as a way to locate new talent in the programming pool. But most developers think of patches as the beach sand they can't get out of their swim trunks. Patches break apps, and then users bitch to publishers, feigning innocence and demanding fixes and replacements. While cheats grant equal justice for all, patches give the edge only to those who've located and installed 'em.

But what the hell. What damage is really being done by cheats and patches? The sooner Johnny reaches the Gold Level, the sooner he'll finish the game and maybe get going on that matrix-algebra paper he was supposed to have handed in a week ago.

The Internet cheats might be doing the real harm.

The more I learn about ways to hack a network game to give myself an edge, the more impressed I am with the gamers in question. You have games in which you're supposed to use the most primitive sections of your brain to kill, stalk, shoot, destroy, and splatter, yet some gamers are also working the higher functions. How about an app that floods a competitor's machine with network packets, so that the machine is too busy sorting them out to process your opponent's command to get out of the way of your Mojo Cannon of Death? What about a secret app that analyzes everybody's game packets and automatically translates your basic Shoot command into Calculate a Maneuvering and Firing Solution and Kill Any Player Who's Open at the Moment?

It's glorious. But this sort of cheating can also kill the potential of Internet gaming.

Wouldn't it be great to have The Sims run in a planetary mode, where your Sim would transparently and automatically interact with real neighbors and commute to shared Sim Cities? You could come home one day and find that your Sim had met, courted, and married someone else's Sim. That'd be cool. But it won't happen if all games played on the Net are competitions to see who can run the best hacks and deploy the most successful countermeasures.

The poor five-year-old who has logged on to Parker Brothers' Web site just to play NetCandyLand has no idea she's competing against college CompSci majors who've written CandyBots to crush her in three moves—and who are blowing off classes so they can create a new version that can do it in *two*.

See, cheating that makes the game more fun makes gaming better. Cheating that just helps the Gaming Elite feel even elite-ier about themselves restricts the huge potential of the field and cheats all of us.

And anyone who tries to flood my IP address during an office Unreal session will soon find out that there's no counter-hack that successfully defends against the edge of a three-foot steel ruler singing into his or her third distal phalange. **m**

ANDY IHNATKO (www.andyi.com) didn't write this column; he just knows the best cheat codes in Microsoft Word.

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

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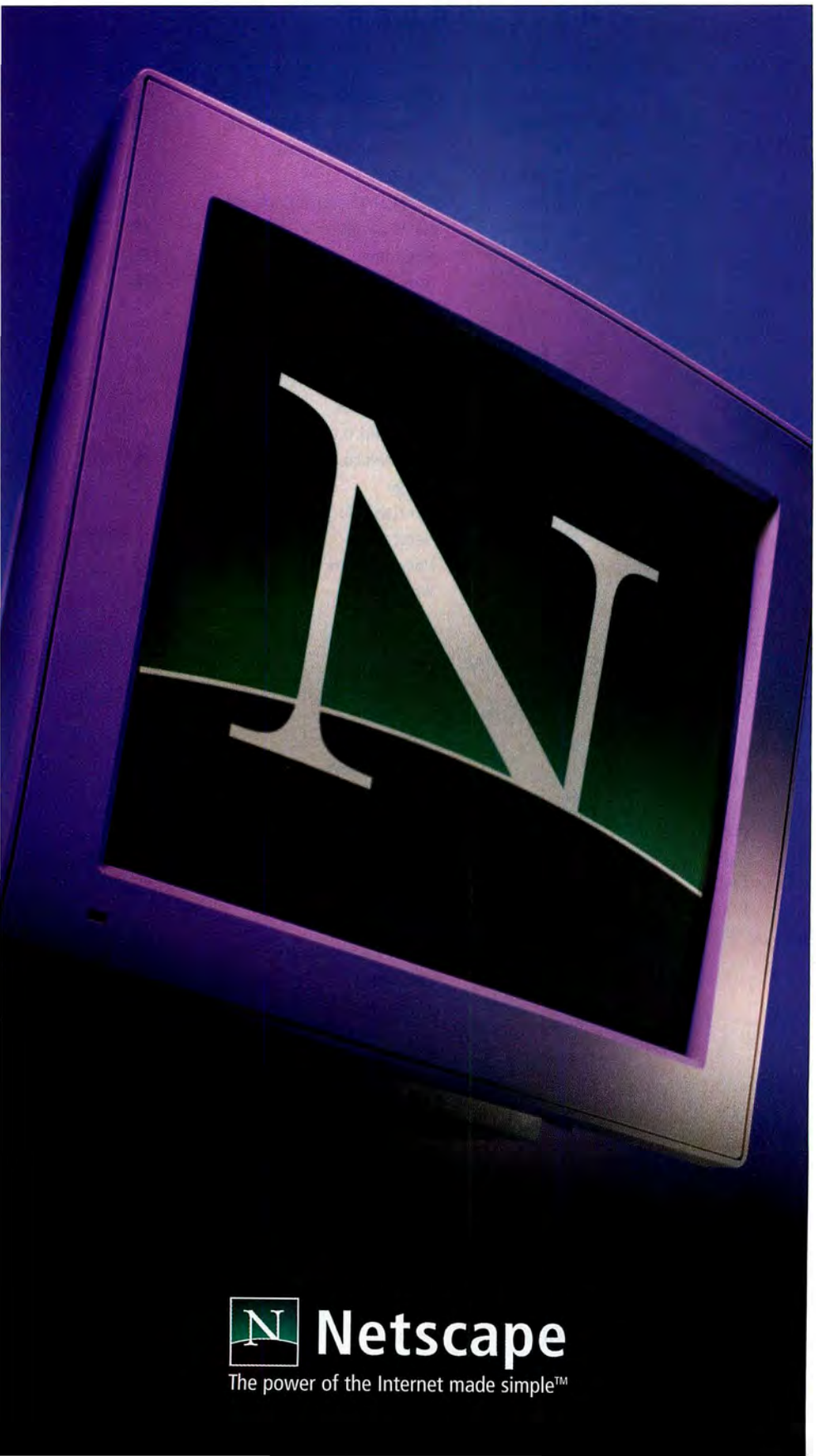

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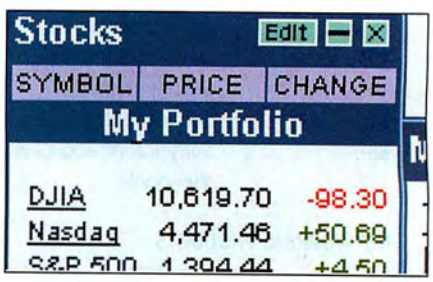

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See page 4 of 9

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See page 2 of 9

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only $1799!

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See page 3 of 9

▲ Apple 15" Flat Panel Display (shown), $999, item #M0N1093.

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adaptec

PAGE 2 OF 9

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- DVD-ROM Drive with DVD-Video Playback
- ATI RAGE 128 Pro Graphics Card with 16MB of Graphics Memory
- Apple Display Connector and VGA Connector
- Built-in 56K modem
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CPU1657 ..... Business Lease only $52/mo.§ **$1799**

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Apple Introduces New iMacs: Faster

iMac / 350MHz

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- 7.0GB Ultra/ATA Hard Drive
- 24X (maximum) CD-ROM Drive
- 56K Internal Modem
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- Two USB Ports
- Apple Pro Keyboard and Optical Mouse

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- 10.0GB Ultra/ATA Hard Drive
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- 56K Internal Modem
- 15" Display (13.8" Viewable Image Size)
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Only $399.95!

Ask for item #PR15465.

- 12ppm black • 10ppm color
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Black Ink Cartridge, only $29.99, item #67208.

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Only $499.95!

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- 1.3 megapixel optical resolution
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iMac DV+ / 450MHz

Indigo: Item #CPU1652
Ruby: Item #CPU1653
Sage: Item #CPU1654

$1299! ea.

Business Lease only §38/mo.§

NEW!

The iMac DV+ featuring **iMovie 2**, enables you to watch the latest DVD title in Theater Mode ... and it couldn't be simpler, thanks to the slot-loading DVD-ROM drive.

Features:

- 450MHz PowerPC G3 Processor
- 64MB SDRAM (exp. to 1.0GB)
- 20.0GB Ultra/ATA Hard Drive
- DVD-ROM w/DVD-Video Playback
- 56K Internal Modem
- 15" Display (13.8" Viewable Image Size)
- Two USB Ports/Two FireWire Ports
- Apple Pro Keyboard and Optical Mouse

iMac DV Special Edition / 500MHz

Graphite: Item #CPU1655
Snow: Item #CPU1656

$1499! ea.

Business Lease only §44/mo.§

NEW!

iMac DV Special Edition, the ultra iMac, has it all — Internet, **iMovie 2**, Theater Mode, a super-fast 500MHz PowerPC G3 processor, and a massive 30.0GB hard drive!

Features:

- 500MHz PowerPC G3 Processor
- 128MB SDRAM (exp. to 1.0GB)
- 30.0GB Ultra/ATA Hard Drive
- DVD-ROM w/DVD-Video Playback
- 56K Internal Modem
- 15" Display (13.8" Viewable Image Size)
- Two USB Ports/Two FireWire Ports
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Iomega 100MB USB Zip Drive

NEW LOW PRICE!
Was: $129.95
Now only $99.95!

Zip Disk sold separately.

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Get 2 FREE* Iomega 100MB Zip Disks with the purchase of an Iomega Zip 100MB 4-pack. 4-pack, only $47.00, item #ME8899.
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- Connects your iMac to LocalTalk printers and other Macs
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- 10X Optical/200X Digital Zoom
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Canon

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Item #PR14065

EPSON

- 6ppm black
- 5ppm color
- 1440 x 720 dpi
- USB/Mac Serial compatible

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- Rescue damaged disks

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Microsoft

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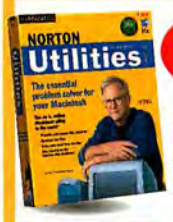

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Item #DMD3503

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- Voicemail/Caller ID

*Capable of receiving data up to 56Kbps. Actual send and receive speeds may vary.

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HP LaserJet Printers

As low as $769.95!

HP LaserJet 2100 shown.

HP LASERJET 2100M

- Prints 10ppm
- 1200 dpi resolution
- HP PostScript Level 2
- LocalTalk connectivity

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Black Toner Cartridge (2100): Item #PA1871, only $99.95

HP LASERJET 4050N

$1489.95 -$200 mfr's mail-in rebate

Only $1289.95*

Lease It for $43/mo.†

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- Prints 17ppm
- 1200 dpi max. res.
- 133MHz RISC processor
- Ethernet 10/100Base-TX

Black Toner Cartridge (4050): Item #PR13025, only $85.99

HP LASERJET 5000N

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Item #PR13443

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- Prints sizes 3"x 5" thru 11"x 17"

Black Toner Cartridge (5000): Item #PR13742, only $139.99

HP LASERJET 8000N

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Item #PR13724

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- 133MHz RISC processor

Black Toner Cartridge (8000): Item #63223, only $155.99

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HP LASERJET 8100N

- Prints 32ppm • 1200 dpi

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Black Toner Cartridge (8100): Item #PA1662, only $178.99

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Features you'll love!

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ViewSonic on top

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TDK.

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• 14.1" active-matrix display
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Lease It for $73/mo.§

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- 366MHz PowerPC G3 processor
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- Supports AirPort™ wireless networking (AirPort Card and Base sold separately)

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- New PC100 100MHz memory upgrades for 400MHz and 500MHz G3s

64MB PowerBook G3 Memory
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Memory prices subject to change.

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Item #DEC4142

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- Reads and writes 3.5" floppies
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120MB SuperDisk Media 10-pack, only $99.90 (only $9.99 ea.), item #BND3239.

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TARGUS

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As low as $139.95
Item #ACC3728

- Lithium-Ion

ACC3728 (fits new 1999/2000 models), only $139.95
ACC3307 (fits 1998 models) shown, only $199.95

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Only $104.99
Item #DEP1900

- Easily connect your iMac or G4 to your LocalTalk printers
- Built-in PhoneNET technology

Farallon

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500MHz G3 with 1MB Backside Cache

Only $499
Item #DRI4150

- Installs in minutes
- iForce utility included

PowerLogix

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Monitors sold separately.

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- 17" (16" viewable) Diamondtron CRT
- 0.25mm aperture grille pitch
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With Diamondtron CRT!

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SONY

- 10x Optical/120x Precision Zoom
- 2.5" Precision SwivelScreen™ LCD
- 1/4" CCD

SWIVEL LCD!

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SONY E500 21" MONITOR

SONY

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- 2048 x 1536 @ 60Hz
- .24mm aperture grille
- FD Trinitron

Ideal for graphic applications!

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iomega

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Macsense

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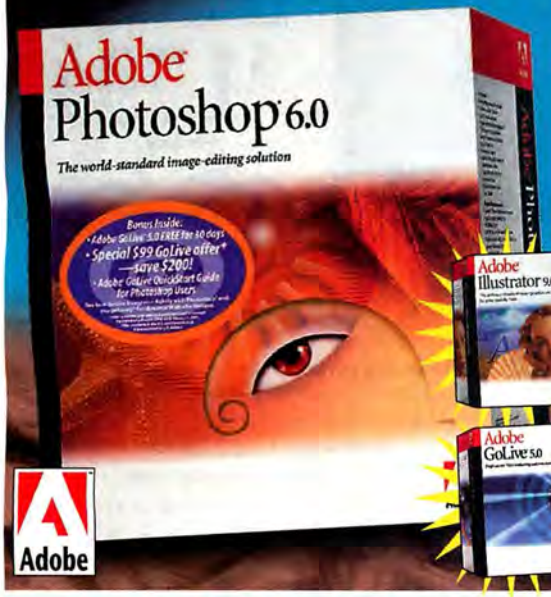

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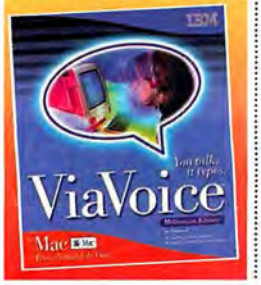

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Virtual Silence

Cooled without a fan, the Power Mac G4 Cube runs in virtual silence. You can truly appreciate the crystal clear audio quality of the Harman Kardon speakers that are included. Bring hi-fidelity sound to music, movies, and games!

Less Is More!

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Outstanding performance

- 450MHz PowerPC G4 processor with Velocity Engine
- 1MB of backside level 2 cache
- 64MB of high-performance memory
- 20GB Ultra ATA/66 hard disk drive
- DVD-ROM drive with DVD-Video playback
- Harman Kardon speaker system
- ATI RAGE 128 Pro graphics card with 16MB of graphics memory, Apple Display Connector, and VGA connector

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- Small footprint for convenient desktop use
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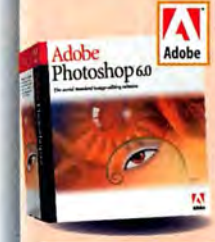

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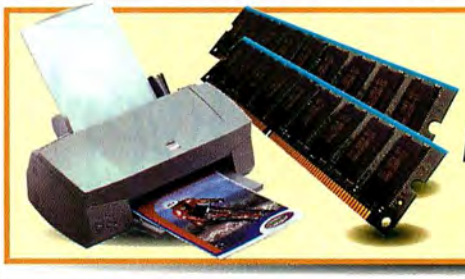

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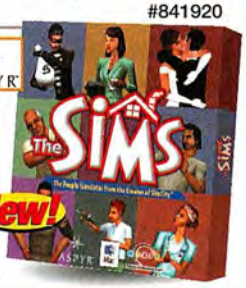

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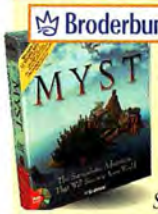

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Indigo DV	400MHz	10.0GB	64MB	CD	2 ports	2 ports	Yes	Yes	Yes	#124913	$994.98	–
Ruby DV	400MHz	10.0GB	64MB	CD	2 ports	2 ports	Yes	Yes	Yes	#124914	$994.98	–
Indigo DV+	450MHz	20.0GB	64MB	DVD	2 ports	2 ports	Yes	Yes	Yes	#124915	$1294.98	$46
Ruby DV+	450MHz	20.0GB	64MB	DVD	2 ports	2 ports	Yes	Yes	Yes	#124916	$1294.98	$46
Sage DV+	450MHz	20.0GB	64MB	DVD	2 ports	2 ports	Yes	Yes	Yes	#124917	$1294.98	$46
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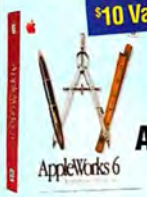

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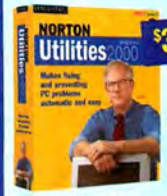

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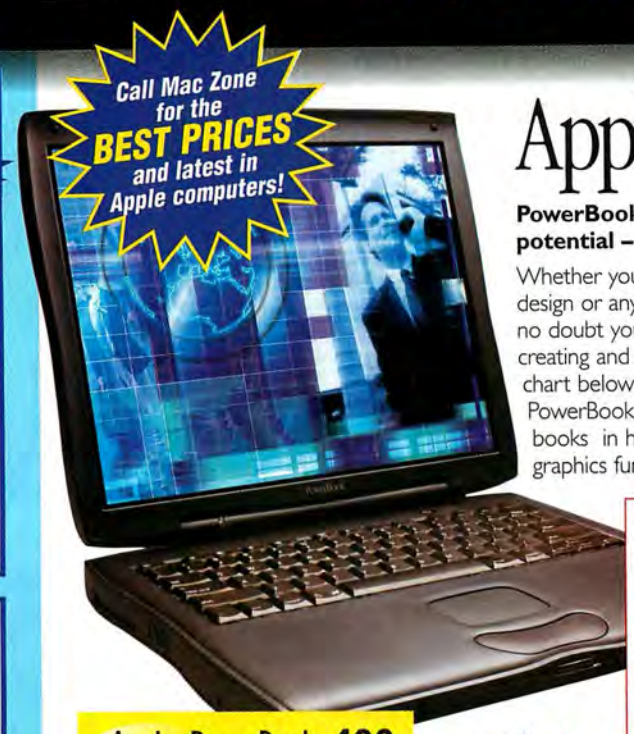

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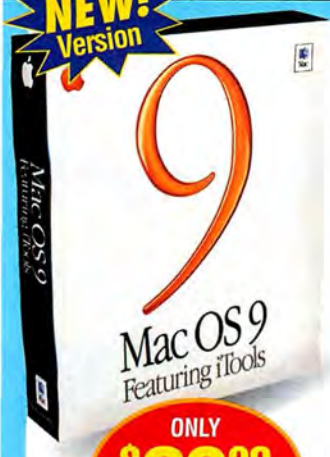

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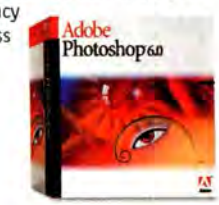

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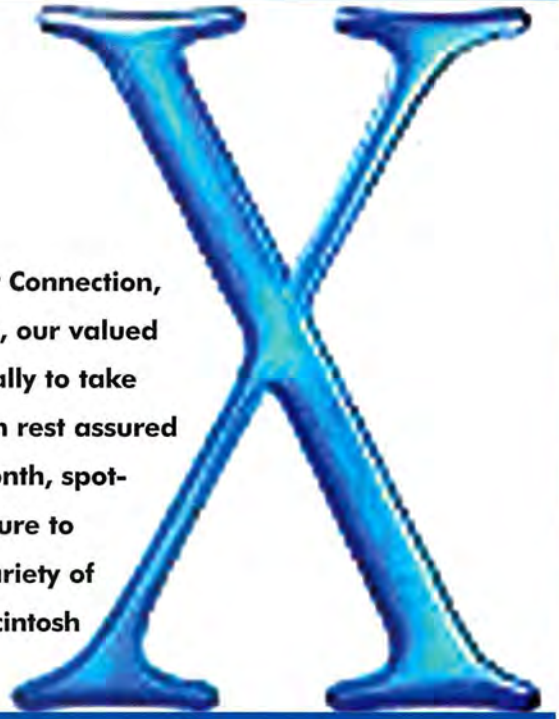

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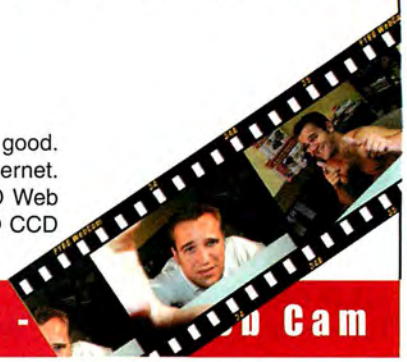

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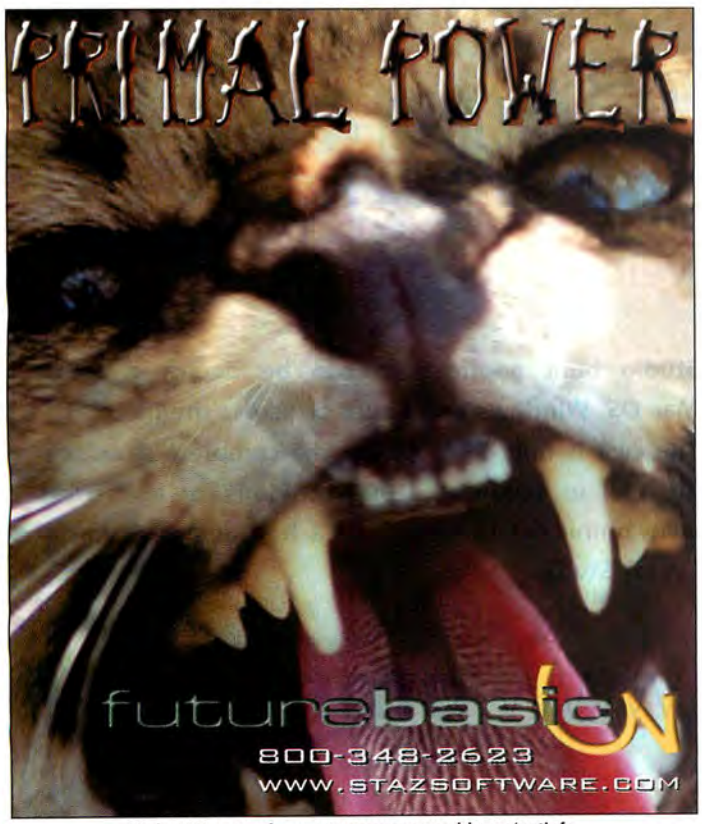

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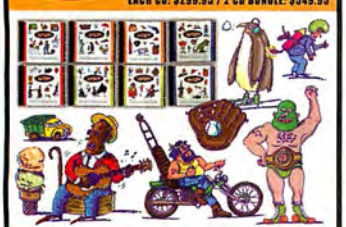

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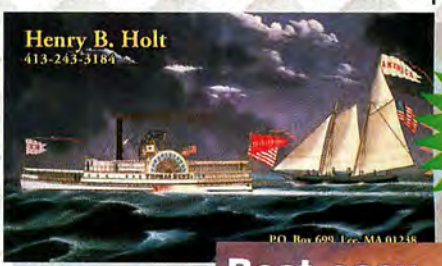

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By being a force of nature. By cutting like a knife through the politics, infighting, and dissention of the 1997 Apple. And yes, by firing people who didn't get with the program. By moving quickly—too fast for studies, consensus, or focus groups—and making decisions on instinct and experience.

He's not alone, either. Behind some of the greatest commercial success stories, you'll find single-minded entrepreneurs who knew exactly what they wanted and tolerated no argument. *Titanic*, the most profitable movie ever made, was the obsession of James Cameron, who wrote and directed it. Jeff Hawkins had to ram his Palm Pilot idea past legions of doubting venture capitalists, parts suppliers, and Microsoft-worshipping reporters. Linux, *Survivor*, Mrs. Fields' cookies, Federal Express, America Online—same story.

In *Inc.* magazine, Harvard psychologist Steve Berglas recently called for Jobs's resignation, predicting that a desperate Apple may have tolerated Jobs, but a robust Apple won't: "When crises threaten to overwhelm an organization, the usefulness of an egomaniacal leader is unparalleled. The rules change radically, however, once a business is established . . . . No one can play the role of enfant terrible indefinitely."

In Apple's case, I'm not so sure about that. It's been a year since Berglas's article, and Jobs has somehow continued to dream up more *Titanic*s and Palm Pilots, sometimes over the objections of his engineers. (As it turns out, plenty of people at Apple thought that offering a choice of iMac colors was a stupid idea.) The iMac, the iBook, the G4 Cube, and Mac OS X never would have seen the light of day in a kinder, more consensus-driven Apple.

No, I wouldn't want to work for Steve Jobs. And I certainly wouldn't want to *be* Steve Jobs; he's driven by demons that Wes Craven doesn't even dream about. But as long as he keeps the job, I'll be his customer—and his highly entertained audience. **m**

DAVID POGUE (www.davidpogue.com) is a coauthor of the forthcoming *Piloting Palm*, the story of Jeff Hawkins and Palm Computing (O'Reilly, 2001).

DAVID POGUE

In Praise of Corporate Tyranny

IT TAKES A FORCE OF NATURE TO MOVE MOUNTAINS

The other day, I heard an Apple programmer griping about Steve Jobs. It was the usual complaint: Steve wasn't taking opinions, conducting focus groups, or performing usability testing. He wanted things done Steve's way.

For years, these stories have upset me. I'm a firm believer that if something is worth doing, it's worth doing politely. There's no CEO on earth that couldn't benefit from weighing opinions, considering all options, and occasionally doling out a little praise. Yeah, OK, Steve saved Apple in a big, glorious, sustainable way; introduced some brash, bold, brilliant ideas to the technology world; and changed the course of computer design forever. But jeez—does he have to be such a bully?

Well, yes.

I came to this startling realization when I read *On the Firing Line,* Gil Amelio's book about his 500 days as Apple's CEO. What's most intriguing about the book is the "damn frustrating" inertia and paralysis Amelio says he found at Apple. He'd schedule a meeting: "People who were specifically invited didn't even bother to show up." He'd outline the company's strategy to department VPs: "They listened politely but did nothing." He'd make a decision: "Every time, an internal campaign would be mounted to reverse the decision." He'd try to focus the company's efforts (which included "the Newton, publishing, media authoring, servers, Pippin, imaging, consumer, K-12, the PowerBook, Copland, OpenDoc, and the Internet"): "No one would listen. Nobody would agree to give anything up."

Reviewers have already pointed out that Amelio's entire book is a 300-page "Don't blame me!" statement, and that he's fishing for sympathy when he's the one who failed to save the company. But even if what he says is only half true—for example, that "everything at Apple felt like bench-pressing 500 pounds"—it tells you something: by 1997, Apple's employees had become the boys on the *Lord of the Flies* island. The pirate-flag–waving atmosphere that Jobs had created in the '80s had grown wildly out of control, and the ship's rudder was completely disconnected.

Yes, Jobs had ideas; yes, he's charismatic; and yes, he had power and influence in Silicon Valley. But those traits don't fully explain how he turned Apple's image around. And they certainly don't explain how he made the company *profitable*—an astonishing feat for a guy who never went to college, let alone business school. How was Jobs able to make Apple profitable where a string of experienced corporate veterans (and even "turnaround artists" such as Amelio) had failed?

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