Macworld

07.2001

DOES MEGAHERTZ MATTER?

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REWRITING THE iBOOK

Hands On: Apple's Smaller, Lighter, Low-Cost Laptop

REVIEWED

Final Cut Pro 2
Apple's Video Editor Gets Blockbuster Update

iDVD
Bugs Hinder Free DVD Burner

CD-Burning Software
Get More from Your CD-RW Drive

G4 Upgrade Cards
Take Your G3 to the Next Level

MAC OS X SECRETS

Go Inside Apple's Brand-New Operating System

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The new iBooks are a perfect match for Mac® OS X.[5] It's the most advanced, most easy to use and visually stunning operating system ever created. And you won't miss any of it on iBook's breathtaking 1024 x 768 TFT display.

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Incorporating MacUser

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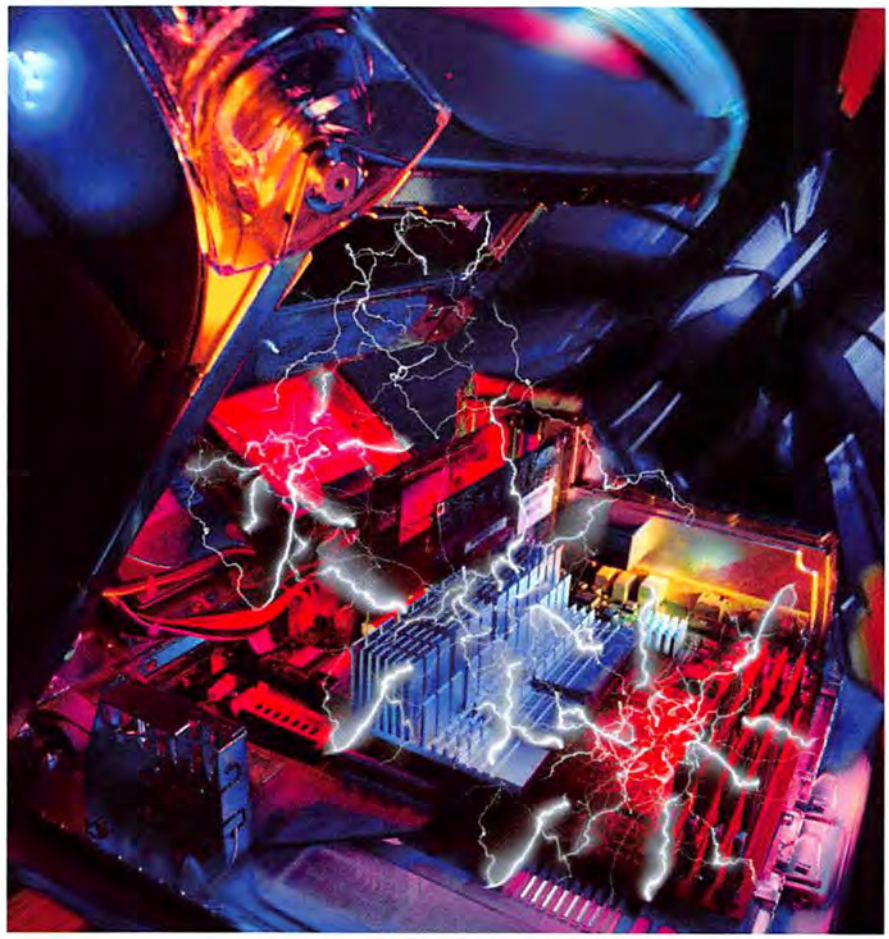
CHRISTOPHER BREEN Mr. Breen solves the mysteries of disappearing disk space, using Disc Burner with a particular internal CD-RW burner, and printing via infrared.



Does MHz Matter?
JONATHAN SEFF Buying a Mac can be expensive, so you want to get exactly what you need. For example, which will do more to speed up Adobe Photoshop: added RAM or a faster processor? *Macworld* looks at a range of components to see which ones help performance in different areas of computing.

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Ihnatko
ANDY IHNATKO Yeah, the Palm is great and all—but Andy still pines for an Apple handheld.

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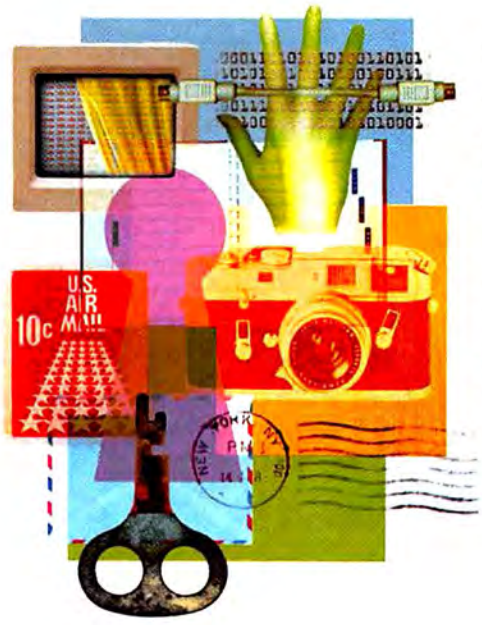

Inside the OS X Extras
The new operating system isn't all that comes on the Mac OS X disc. There's also a bundle of software, much of it brand-new. We explore significant features and unexpected uses of the best apps.

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Big Thing, Small Package
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Get the skinny on the latest iBooks and see how they compare with those that came before.

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Old Mac, New Tricks
ADAM C. ENGST In the second part of our series, learn how to turn an older Mac into a Web server that can host everything from baby pictures to a moneymaking site for your business.

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Photograph by Stan Musilek

Macworld.com
Learn how to use an older Mac as a kitchen assistant, participate in our lively forums, and read reviews you won't find anywhere else.

Reviews

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♦♦♦♦ Final Cut Pro 2

30 G4 processor upgrades
♦♦♦♦½ Sonnet Technologies Encore ZIF G4 400MHz
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♦♦♦½ XLR8 Mach Speed G4 ZIF MPe 450MHz
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32 CD-burning software
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34 DVD-authoring software
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35 Calculation software
♦♦♦♦ CalculationCenter

36 Soundtrack-creation software
♦♦♦♦ SmartSound Sonicfire Pro 2.0

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39 Text organizer
♦♦½ Boswell 1.0

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♦♦♦½ Stata 7.0

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41 Game
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Courtesy of VersionTracker.com

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Macworld.com Reviews

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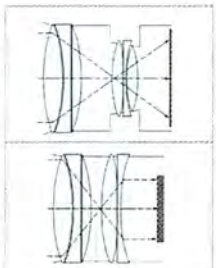

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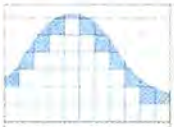

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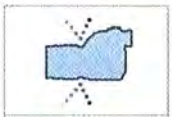
It began with a 4 million pixel CCD. To take full advantage of such small pixels, the E-10 lens had to have a resolution three times better than that of a 35mm lens. It also had to direct light at much flatter angles than a film lens, in order to fill the pixel wells properly. Clearly, simply attaching an existing film lens to a digital body wasn't good enough.



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Exposure: Manual exposure (1/60), aperture f9.0, ISO 80, manual white balance 5500°K
Light: Studio strobes with beauty dish

For information on the CAMEDIA E-10, visit http://e-10.olympus.com or call 1-888-55-DIGITAL.

ANDREW GORE

Experience iBookgrüven

Apple's Portables Succeed Because They're Fun to Drive

THE OTHER DAY, I LEARNED that *Fahrvergnügen*—the clever-sounding German slogan that Volkswagen has been using for years—is a real word, not just a creation of the folks who brought us the New Beetle. It means "driving pleasure," and it refers to that elusive moment when driving a car is no longer about utility, but rather about the simple joy of driving. A vehicle with Fahrvergnügen is a pleasure to drive, even when you have no place to go.

With the introduction of the new iBook (see "Big Thing, Small Package," *Buzz*, in this issue), Apple now dominates the portable-computer world in terms of price, performance and engineering. But even more important, Apple has cornered the market in Fahrvergnügen. Whether it's one of these new iBooks or the Titanium PowerBook G4, using a Mac portable is a pleasure that transcends getting the job done. Sure, most of the things I do on an iBook or Titanium PowerBook I could accomplish on a PC portable, but I wouldn't enjoy doing them nearly as much. That enjoyment has a real payoff: I'm using my portable more; and I'm also finding more ways to be productive with it.

This is why the popularity of portable Macs, measured as a percentage of all Macs sold, has tripled in the past year. And it's why I believe the day is coming when portables will be Apple's primary method of recruiting PC users to join the ranks of the Mac faithful.

Formula for Innovation

Innovation happens when you combine need, opportunity, and—for lack of a better term—the willingness to "think different." It's always been vital to innovate in the design and construction of portable computers, much more than with desktop PCs. And when it comes to personal computers, none are more personal than the portable. A desktop machine challenges you to work on its terms, but the portable begs to be your companion, to work where and when you want to. People who use portable computers look first and foremost for flexibility, and that flexibility demands innovative designs and technology.

Case in point: On a desktop computer, AirPort wireless networking is a convenience, saving the owner the trouble of having to run wires all over the house or office. On a PowerBook or an iBook, AirPort is a declaration of independence. It enhances flexibility, because it ensures that you can connect wherever and whenever you need to.

Portables need to be more rugged than desktops. They need to be smaller, which requires greater engineering finesse and more-expensive components. They need to work under a wide variety of conditions, which means they must have their own reliable source of power and an array of networking options, from modems to Ethernet. They even need to be able to handle assorted power sources, in places from the United States to Uganda, because a road warrior never knows where the road will lead next.

Design Rules

A key difference in the way Apple engineers a portable, in contrast to most PC companies, is that at Apple, technology doesn't drive design. Apple waits until current technology can serve its design goals. And when the technology is finally ready, Apple seizes the opportunity to fulfill plans it has been making, in some cases, for years.

This approach has sometimes left us Mac portable users feeling a little left out. For the past couple of years, we've watched Sony Vaio users get tiny, lightweight notebooks while we die-hard Mac fans had to lug around our luxurious-yet-large PowerBooks and iBooks.

All for one simple reason: Apple refused to ship a computer with anything less than a complete set of ports and capabilities, such as a DVD-ROM drive. And that meant no light, tiny, gorgeous Apple subnotebooks were in the offing.

So Apple waited. And we waited.

Apple's Innovation

When at last available technology allowed Apple to fulfill its design goals, the final part of the formula for producing a great portable computer came into play: innovation.

In the portable-computer world, innovation means more than delivering small, light, full-featured computers that are as much like desktop machines as possible. If that were all that mattered, we'd all be using Dells. No, there's also the gestalt of all those components—in the end, a computer should add up to more than the sum of its parts.

Different Beasts

Apple doesn't design a high-end laptop and then tear features off of it to make a consumer model. Nor does it build a cheap portable and then graft on extra features in order to market it to professionals. Instead, Apple chooses an audience, figures out what that audience requires, and then designs the best computer it can for that audience. That's why the iBook and the PowerBook G4, for all their similarities, are different beasts: they're meant for different audiences.

And because they're so different, they appeal to people with different needs. I already know a handful of Titanium PowerBook G4 owners who plan to buy iBooks to use as rough-and-ready portables in situations where compactness and toughness trump screen space and performance.

And let's not forget that a key part of innovation is realizing how even small touches can radically improve the quality of a product. Batteries should slip in and out easily, and they should have power-level indicators you can see from the outside of the machine. The power button should be visible, without making you hunt for it on the back edge of the computer. Ports should be located in logical places, clearly labeled, and easy to access.

In other words, function should inform design.

Finally, because a portable is meant to be handled, the way it feels in your hands should be just as compelling as its spec sheet and its price tag. The new PowerBooks and iBooks want to be touched, and touching them is a pleasure. That's a good thing, because they'll get touched a lot during daily use.

Toasting the Competition

All these elements combine to create the computer industry's only portables with Fahrvergnügen. The new iBook in particular is a amazing, because it offers driving pleasure in a portable that is also inexpensive. Nothing enhances driving pleasure more than using a machine that feels cool, fast, and expensive—but actually costs much less than you'd expect for such an advanced piece of engineering.

For me, I get the ultimate reality check on these products by gauging the reaction of entrenched PC users I know. And they lust for Apple's new portables. Since the PowerBook G4's introduction, I've seen it seduce at least one PC-using friend of mine who'll never go back to the dark side. And in Macworld.com's forums, I've read countless testimonials from other PC users who also made the switch to the Mac—all thanks to the Titanium PowerBook G4.

It will be interesting to see whether the latest iBook will have the same effect. Because its cost is so low, I predict that even more PC users will become iBook users. The only question is, will the overall experience of owning an iBook be appealing enough to draw them to the Mac for good?

I plan to test my theory on yet another friend who is a longtime PC user and clearly a member of the iBook's target audience. Once we get a cool new iBook in her hands, we can judge the power of iBookgrüven—as it brings her driving pleasure, Macintosh style. **m**

ANDREW GORE is *Macworld*'s editor in chief. To comment on this column, type **Vision Thing** in the Search box at Macworld.com.

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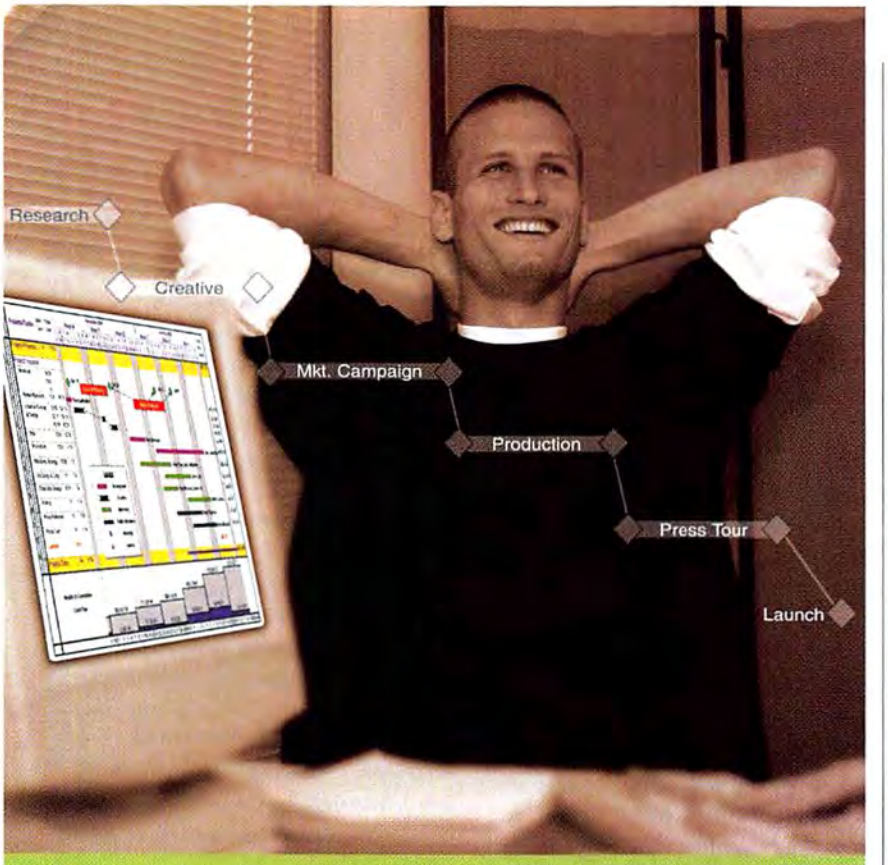

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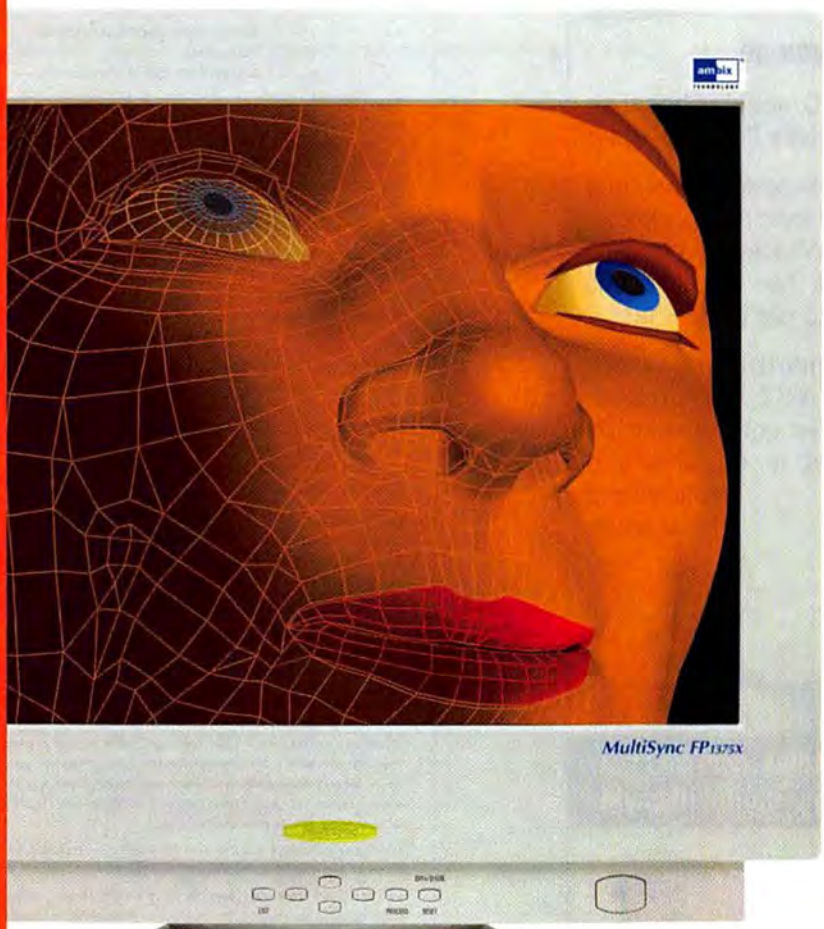

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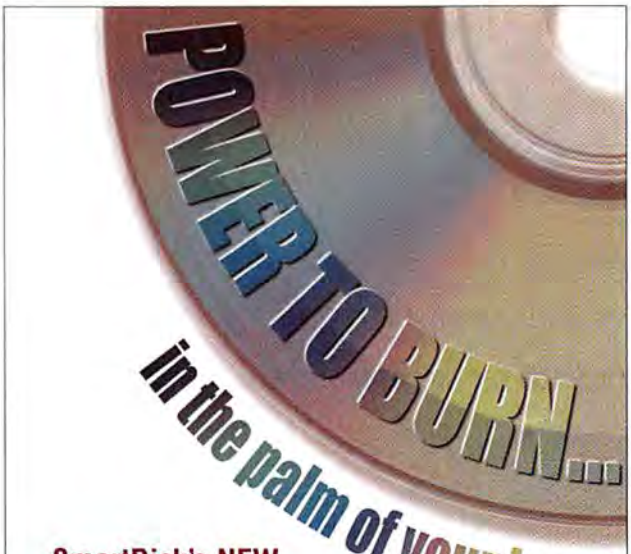

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BPA

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Feedback

Tax Shaft

Thanks to the Internal Revenue Service, April most definitely is the cruelest month. So it's no surprise that most of the mail we received about April's *Macworld* was from unhappy taxpayers who were concerned about our review of tax-preparation software (*Reviews*, April 2001).

H&R Block Financial's Kiplinger TaxCut Deluxe claims to allow a user to e-file both federal and state tax returns (in 26 states). But the program will not allow you to do this if you've received income reported on a 1099-Misc form, as independent contractors do. In addition, the state edition overlooks 1099-Misc income when calculating gross income. It totals only income reported on W2 forms.

GARY SCHAUB, JR.
Pittsburgh, Pennsylvania

I have a PowerPC with a G3 upgrade running OS 8.5.1. According to the system requirements on TaxCut's box, the program runs on 68030 and faster processors, and System 7.5.3 and higher. But I had to upgrade to OS 8.6, at significant time and expense, just to get TaxCut to work.

I also discovered that the downloadable free state-tax software was not available for my state in mid-February, and the company's claim that the software was able to seamlessly download last year's TurboTax information and carryovers was untrue. TaxCut does *not* recognize TurboTax files.

I e-mailed tech support—identifying my problems and asking for assistance—and waited five days for a response before calling. After holding (at my expense) for 50 minutes, I got a tech-support representative who knew nothing about the Mac.

Giving this program a ♦♦♦♦½ rating was misleading.

CHUCK MILLER
Cincinnati, Ohio

Apple's Audio Blues

Regarding your review of Apple's new Power Mac G4 lineup (*Reviews*, April 2001): something's missing! What is wrong with Apple? At a time when everyone is playing with music files, recording their LPs, and making MP3s, it removes the audio-input feature from its entire professional product line? This has prevented me from buying an iBook and now makes me look at alternatives for the desktop, too.

DONALD SAMSON
Chicopee, Massachusetts

Your review of the 466MHz and 533MHz Power Mac G4s was right on the mark. I just purchased a dual-processor 533MHz model. Like Mr. Breen, I was unhappy to see no audio-in port. It was apparently replaced with a digital audio-out port, which many of us with great legacy speaker systems will never use.

JEFF WAGGONER
Hinsdale, Illinois

Working Blind

Galen Gruman's monitor review (*Reviews*, April 2001) has some useful information but makes no reference to some important aspects of a good monitor. It would've been helpful if the author had included information about gray-scale accuracy, color-temperature accuracy, and chromaticity coordinates for the three primary-color phosphors. Without this information, a true image professional may as well be working blind.

DAVE CORBITT
Madison, New Jersey

Free Doesn't Cut It

I went to FreeSamples.com ("The Great Giveaway," April 2001), and the only things available for free were lollipops and Mrs. Dash. The

bank gives out free lollipops.

JAN SHARROW
Atlanta, Georgia

Mini Mouse, Big Oops

Contour Design's MiniPro Optical Mouse was recently reviewed on Macworld.com. In the review, some errors were made. The mouse *does* have software for customizing button functions. The MiniPro Optical Mouse software is designed to be downloaded from our Web site. Furthermore, the mouse has *two* buttons and no scroll wheel for ergonomic reasons. The MiniPro Optical Mouse is designed to be portable and go anywhere. It is too small to have side-by-side buttons or a scroll wheel.

YAISHALI PATEL
Contour Design

The review has been updated online, and our mouse rating has been adjusted accordingly.—Ed.

Big Brother Likes Dead Trees

Perhaps I missed it, but in James Bradbury's article "Quicken versus the Web" (April 2001), I didn't see any discussion about search and seizure laws as they relate to online bill-payment services. Last time I checked, the restrictions that apply to Big Brother examining bills paid through snail mail do not apply to bills paid electronically. I would be happy to be proved wrong on this.

SCOTT STEVENSON
Los Altos, California

Without going into whether it's easier for the government to pry into bills paid online, I suggest never doing anything online that you want kept secret. Unless you're paying cash, though, you always leave an electronic trail.—James Bradbury

Viva MacPipes! Viva Ihnatko!

I just wanted to thank Andy Ihnatko for recommending the shareware game MacPipes (*The Game Room*, April 2001). When I was younger, I was addicted to a similar game. Unfortunately, it was on an old 66MHz computer. I'm glad someone found this game for me, and even better, I can play it on my iMac!

REBEKKA WENDELN
West Carrollton, Ohio

Encore

I thoroughly enjoyed your story about Macs on the big screen ("Great Performances," *Buzz*, April 2001). But there was a glaring omission: *Jurassic Park*. Who could forget smoking Samuel L. Jackson and his Macs that ran the island? And Wayne Knight (*Seinfeld*'s Newman) plotted the theft of dinosaur DNA and sabotaged the entire network with his Mac.

MATT BARNETT
Fishers, Indiana

Mark Up

I've been reading Andrew Gore's "PowerBook G4 Diary" (Macworld.com), and I wonder if the keyboard touching the screen is a problem for everyone. I was told that I was the first South American to have one of these mean 500MHz machines, but I don't want to be the first with a marked screen!

CARLOS SANTA CRUZ
La Paz, Bolivia

You can wipe the marks off easily with a soft cloth.—Ed. **m**

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The Feedbag

Much of the mail we get here at *Macworld* has nothing at all to do with our little magazine. Sometimes, readers just want to ask us general questions, and we're always more than glad to answer. Which isn't to say that those answers will always be correct—but we'll try.

Dan and Jan want to know what to do with their six-foot-tall Lara Croft statue. "We are the proud owners of one of these models, and we would like to find out its value, with a view to selling. We know it's one of only 50 made."

Our advice? Don't sell it; instead, run out and buy the other 49. Corner the Croft market—that's 300 feet of Lara! If only Billy Bob Thornton were so lucky: all he has is that financially worthless, live Angelina Jolie. And she's only, what, five feet and seven inches tall?

Meanwhile, Adam wants to know all about the ⌘ key. "I am wondering what the symbol on the Mac keyboard's command key is," he writes. "Does it have any significance or history? I am actually curious about getting it as a tattoo. Where could I get a better picture of it?"

You mean taking your iBook down to a tattoo parlor and saying "This key, please" won't cut it? Boy, today's tattoo artists are a fussy lot. Anyway, Adam, the history question has us completely stumped. We suspect, however, that Woz and Jobs swiped it from the cover of *Led Zeppelin IV*.

Of course, we've been wrong before.

FIRST LOOK

The New iBook: BIG THING Small Package

BY ANDREW GORE AND PHILIP MICHAELS

APPLE SACRIFICES SIZE, Not Strength, with Latest Portable Update

THE TITANIUM POWERBOOK G4 has been a big hit for Apple—in just four months, the company has sold more than 115,000 of the power-packed portables. Now it's time for Apple's other laptop to get the Titanium treatment. Meet the new iBook, a slimmer, sleeker, whiter version of the original introduced by Apple nearly two years ago.

This new iBook is all about size—or lack of it. It's 9.1 inches deep by 11.2 inches wide, meaning it's not much larger than a three-ring binder. Like the inch-thick PowerBook G4, the iBook has gotten slimmer; it's now just 1.3 inches thick. That's helped to drop the iBook's weight to 4.9 pounds.

But Apple didn't sacrifice functionality in slimming down the new iBook. This Mac is stocked with a 500MHz G3 processor, a full slate of ports (see "Ports Aplenty"), and a full-size keyboard. iBook buyers also get a choice of optical drives. The basic $1,299 model comes with a 24× CD-ROM drive and 64MB of installed RAM. An iBook equipped with 128MB of RAM and a DVD-ROM drive costs $1,499; with 128MB of RAM and an 8×4×24× CD-RW drive, $1,599; and with 128MB of RAM and a combination CD-RW/DVD-ROM drive, $1,799.

Outside and Inside

With this revision, Apple's recent penchant for sprucing up its machines with eye-catching colors appears to be receding quickly in the company's rearview mirror. The so-bright-it-glows shade of last fall's key lime iBook? It's gone, along with the original iBook's extrawide curves and spring-loaded handle.

The new model is almost the anti-iBook: a smooth, almost featureless white box with rounded edges and corners. Where the original design was sassy, this iBook is simple; while the old portable screamed for attention, this one merely whispers.

BUZZ

News, Views, and Chatter from the World of Macs

Instead of bright colors, the new iBook features an evolution of the computer-trapped-in-Lucite look of the Power Mac G4 Cube. The iBook is sheathed in a millimeters-thick clear plastic coating that is warm and grippable—and, on first examination, appears to be highly shock- and scratch-resistant. Around the middle is a band of metallic gray that ties the new iBook to the 2001 edition of Apple portables. Sitting next to a Titanium PowerBook, the iBook looks like it belongs, sharing such touches as the same magnetic catch and rounded metal release button on the front and a glowing crystal Apple logo.

Unlike the Titanium PowerBook, however, the iBook's shell does not contain any exotic metals. Its chassis consists primarily of polycarbonate plastic, stiffened by a magnesium frame. The drive is mounted in rubber, and the case has no external latches, doors, or hinges—except the primary hinge that connects the top and bottom of the clamshell case. And that hinge speaks to the iBook's resilience

The iBook's New Chapter

PROCESSOR SPEED	BUILT-IN RAM	STORAGE	OPTICAL DRIVE	PRICE
500MHz G3	64MB	10GB	CD-ROM	$1,299
500MHz G3	128MB	10GB	DVD-ROM	$1,499
500MHz G3	128MB	10GB	CD-RW	$1,599
500MHz G3	128MB	10GB	CD-RW/DVD-ROM combo	$1,799

—the firm, thick hinge swings the screen back and down, behind the computer's back edge, which lowers its overall height when open.

According to Apple, the combination of all these design factors makes the new iBook twice as durable as the older model, even though it has less "shock space" inside the case. Apple has even added metal collars around the rubber feet on the bottom, to help protect the feet from being pulled off in a student's rough-and-tumble day.

Checking Out the Specs

Apple didn't add a G4 processor when it revised the iBook. Still, the new-look laptop hardly lacks for power. All four configurations come with a 500MHz PowerPC G3 processor with 256K of Level 2 cache; however, the computer's system bus runs at 66MHz, still the slowest of all currently shipping Mac models. Besides the 64MB of RAM soldered to the basic model's logic board and the 128MB of soldered-on memory in the other configurations, the iBook allows for expanded RAM via a single PC100 RAM DIMM slot. The result? Your fully loaded iBook will have between 576MB and 640MB of RAM, depending on the model you buy. A 10GB Ultra ATA drive is standard on all models, although you can choose to have Apple install a 20GB internal drive (for an extra $200) instead.

> Where the original design was sassy, this iBook is simple; while the old portable screamed for attention, this one gets noticed by merely whispering.

The iBook's screen has also gotten a boost. It's still a 12.1-inch active matrix display, but now it offers a resolution of 1,024 by 768 pixels, as opposed to the original iBook's 800 by 600. This means there are a lot of pixels on a comparatively small screen—and while the display is relatively sharp, it may be hard for some users to read. In 1,024-by-768 mode, type was a bit too small for one editor's nearsighted, just-short-of-40-year-old eyes. Of course, you can lower the screen's resolution to try to compensate, but because 1,024 by 768 pixels is the native resolution of the screen, all lower resolutions have to be created via *pixel interpolation*—small pixels emulating larger pixels—and the results can be blocky and fuzzy.

If you're looking for accelerated video power, this system will leave you wanting more. It has an ATI Rage Mobility 128 graphics controller and 8MB of graphics RAM—the same as the PowerBook G3 and G4. Unlike earlier models, however, this new iBook offers RGB-video out. This lets you use a special monitor cable adapter to drive an external monitor—which must mirror the contents of the iBook's built-in screen. As with the last generation of iBook, this model can output composite video as well, through a different adapter cable.

continues

iBooks Take Apple Back to Class

MACS AND SCHOOLS—the two go together like recess and kickball. And Apple hopes to keep it that way with help from the iBook.

Putting Macs in schools helped Apple make a name for itself in the early days of the company. That commitment hasn't gone away, but Apple no longer finds itself at the head of the class. PC maker Dell claimed the top spot in total education sales last year—a situation Apple has vowed to reverse. The company has brought in two new education executives and purchased PowerSchool, a Web-based student information system. And now Apple has added a redesigned iBook to its arsenal of products.

Looking at the numbers, it's easy to see why Apple is counting on the iBook to restore its leadership position in education. Even when Apple lost the overall top spot to Dell, it still sold more notebooks to schools and students than any other computer maker. And market research firm IDC says demand for notebooks grew 2.5 times faster than demand for desktop computers in 2000.

Apple believes that wirelessly networked notebooks such as the iBook are the future of computers in education. Presently, schools tie up classroom space by turning entire rooms into desk-bound labs. To use the labs, students have to move from classroom to classroom—not exactly a recipe for productivity, Apple CEO Steve Jobs explained.

Instead, Apple envisions schools stocking up on laptops—AirPort-equipped iBooks, naturally—and moving the computers to each classroom via a mobile cart. "The computers move from room to room, not the students," Jobs said.

It's fitting, then, that Apple's first customer for the new iBook is the Henrico County school district in Virginia. The district bought 23,000 iBooks, enough to give one to each of its middle- and high-school students and teachers this fall.

"We're going to take all these beautiful iBooks, put them in the hands of teachers and students, and change the world," said Dr. Mark Edwards, Henrico County schools superintendent, when Apple announced the record sale.

That's music to Jobs's ears. "Apple has been helping teachers teach and students learn since 1977," he said. And if the company's recent efforts are any indication, Apple has no plans to stop now.—PHILIP MICHAELS

As with previous models of the iBook, Apple claims you can run this model on battery power for five hours. The battery is still mounted in the bottom of the unit. But unlike the old power pack, the new battery is smaller and easier to remove: there's a single coin screw instead of two. A series of LEDs tells you at a glance how much charge the iBook has.

Upgradability seems to be a strong point: both the RAM and AirPort slots are easily accessible under the keyboard (adding an AirPort card to the PowerBook G4 requires removing the bottom cover).

And, just because Apple's industrial-design group likes to add little surprises to all its designs, the new iBook's sleep indicator light is on its front edge, embedded under the plastic skin and visible only when it cycles slowly from dim to bright.

> While the new iBook may not have all the muscle of a PowerBook, it certainly keeps pace, feature for feature.

The Bottom Line

Portables are the fastest-growing segment of Apple's business—nearly 30 percent of the systems the company has sold this year, versus just over 10 percent in 1999. It's easy to see why: as other companies threw features overboard to help reduce size or lower prices, Apple held out for the technology and the component prices to reach levels at which it could offer complete solutions in each niche. That's especially true in consumer portables. There, PC vendors knock off features from their high-end notebooks to get prices down. But Apple engineers the iBook with no compromises, and it shows. While the iBook may not have all the muscle of a PowerBook, it certainly keeps pace, feature for feature.

And that's good news for iBook users who are looking for a lot in a little package. **m**

iBooks: Then and Now

Here's how the iBook has evolved since Apple unveiled the laptop in 1999. Each example represents the highest-end iBook available at the time.

MODEL	PROCESSOR SPEED	BUILT-IN RAM	STORAGE	OPTICAL DRIVE	MAXIMUM RESOLUTION	VIDEO OUT	SIZE (IN INCHES)	WEIGHT
July 1999 iBook	300MHz G3	32MB	3GB	CD-ROM	800 × 600 pixels	No	13.5 × 11.6 × 1.8	6.7 pounds
February 2000 iBook SE	366MHz G3	64MB	6GB	CD-ROM	800 × 600 pixels	No	13.5 × 11.6 × 1.8	6.7 pounds
September 2000 iBook SE	466MHz G3	64MB	10GB	DVD-ROM	800 × 600 pixels	Yes (composite)	13.5 × 11.6 × 1.8	6.7 pounds
May 2001 iBook	500MHz G3	128MB	10GB	CD-RW/DVD-ROM combo	1,024 × 768 pixels	Yes (RGB and composite)	11.2 × 9.1 × 1.3	4.9 pounds

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POWERPC VS. PENTIUM

MORE THAN JUST MEGAHERTZ

GO TO A MACWORLD EXPO KEYNOTE SPEECH, and you're bound to see it—a demo that shows a Mac blowing away its Wintel rivals. Apple executives run an Adobe Photoshop file on machines with the fastest available PowerPC and Pentium processors: the Mac sprints to the finish line first, and the Wintel PC staggers down the home stretch like a weekend jogger running a first marathon.

Apple's point is really quite simple: megahertz numbers aren't everything. (See "Does MHz Matter?" elsewhere in this issue.) Chip architecture is just as important—that's what helps a Power PC CPU outperform a faster Pentium chip. For example, at the January 2001 Macworld Expo, a 733MHz Power Mac G4 finished a Photoshop test 33 percent faster than a PC with a 1.5GHz Pentium 4 processor did.

Does Apple's example hold up in a real-world road race? To find out, we ran six Photoshop 6.0.1 operations on the fastest PowerPC and Pentium chips we could find: a 733MHz Power Mac G4 and a Gateway Performance 1500XL with a 1.5GHz Pentium 4 processor (with added memory and an Nvidia GeForce2 MX graphics card, for more-comparable performance).

Going up against a Pentium 4 processor roughly twice its speed, the G4 more than held its own. The

A Photo Finish?

Macworld LAB TEST

Best results in bold.
Shorter is better.

	ADOBE PHOTOSHOP 6.0.1						
	Gaussian Blur 10	Unsharp Mask 2.3	Resize 50 Percent	RGB-to-CMYK Conversion	Rotate 0.3 Degrees	Lighting Effects	Total Time
Apple Power Mac G4/733	5	6	2	14	9	6	**42**
Gateway Performance 1500XL Pentium 4 (1.5GHz)	7	4	3	23	12	6	55
	Better	Better	Better	Better	Better	Better	Better

Scores are in seconds. We set displays to 1,024-by-768-pixel resolution and 24-bit color. The Apple Power Mac G4 had Mac OS 9.1 installed, 256MB of RAM, and virtual memory disabled. The Gateway Performance 1500XL was running Windows ME and had 256MB of RAM.—**Macworld Lab testing by Jeffy K. Milstead**

PHILIP KAAKE

Mac and the PC performed most of the tasks in about the same time, with the Mac the decisive winner in two tests.

How did a Mac with a 733MHz processor outperform a 1.5GHz machine? Credit AltiVec, the subprocessor built into a G4—it allows the chip to render graphics and perform calculations faster than an ordinary PowerPC CPU. Adobe designed Photoshop to take advantage of AltiVec; hence the Mac's speedy performance in Photoshop tests. (In April, Adobe announced a plug-in that optimizes Photoshop 6 for the Pentium 4.)

But try other applications, and the speed advantage that the Mac enjoys over a Pentium PC quickly evaporates. Operations in Microsoft Office took longer on the G4—more than three times as much time in one case. Only line-by-line scrolling tests in Word and Excel were faster on the Mac.

The MP3-encoding test is a perfect example of the PowerPC G4 chip's worst-case scenario. Since the Mac version of the MVP player and encoder hasn't been optimized for AltiVec, the G4 lags behind the PC version. (When running AltiVec-friendly SoundJam, the PowerPC edges out the Pentium. Our test also involved reading audio-CD data from the G4's sluggish SuperDrive, which slowed things down further.)

Architectural differences between the Mac and Windows platforms account for the PowerPC's lower Quake III frame rate. Most PCs have a sound card to take the load off the host CPU during game play; the extra processing demands on Apple Sound Manager sent the Mac's score even lower. With Sound Extension turned off, the PowerPC's scores improved.

It's not just marketing spin when Apple says processor speed isn't the only way to determine whether a computer will zip through a task. But if the other factors involved don't favor the Mac, performance will lag behind that of a Pentium machine, megahertz gap or no.—JEFFY K. MILSTEAD AND PHILIP MICHAELS

Speed Limits

Macworld LAB TEST

Best results in bold.
Shorter is better. Longer is better.

	MICROSOFT WORD 9			MICROSOFT EXCEL 9		MVP 1.2	QUAKE III
	Document Scroll	Search and Replace	Auto-summarize	Recalc	Document Scroll	MP3 Encode	Time Demo
Apple Power Mac G4/733	**17**	**49**	**29**	**36**	**11**	**276**	**82**
Gateway Performance 1500XL Pentium 4 (1.5GHz)	51	40	8	22	38	188	126
	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	Better ▶

Word, Excel, and MVP scores are in seconds; Quake scores are in frames per second. The Apple Power Mac G4 had Mac OS 9.1 installed, 256MB of RAM, and virtual memory disabled. The Gateway Performance 1500XL was running Windows ME and had 256MB of RAM.—**Macworld Lab testing by Jeffy K. Milstead**

NO SUPERDRIVE? NO PROBLEM.

BURN, BABY, BURN

If you pine for a SuperDrive but don't want to sell the Power Mac G4 you bought just last winter, don't worry—DVD recording isn't out of reach. At the heart of Apple's SuperDrive is Pioneer's DVD and CD burner, a revolutionary IDE drive that can read and write four formats: DVD-R, DVD-RW, CD-R, and CD-RW. This $995 drive hit the retail market in May as the Pioneer DVR A03 (800/421-1404, www.pioneerelectronics.com). CD Cyclone sells it as the DVDRevo DVD-R/RW, a $990 FireWire external drive (714/247-0099, www.cdcyclone.com). LaCie plans to ship a $999 DVD-R/CD-RW FireWire drive in June (503/844-4500, www.lacie.com).

Although Apple packages its iDVD application exclusively with SuperDrive-equipped G4s, Mac users can turn to several DVD-creation apps, all of which will work with the new Pioneer drive. Can you use it to, say, copy an *X-Men* DVD? Nope. The DVR A03 burns general-use DVD-R and DVD-RW discs, which don't permit bit-for-bit copies of Content Scrambling System-encrypted (CSS) videos. But with programs such as Apple's DVD Studio Pro, you can create a professional-looking DVD of your iMovie homage to Fellini or your recent trip to Cancún. DVD pros can use the DVR A03 to burn preview discs for clients, although general-use discs are unsuitable for mass reproduction. Pioneer's drive also writes CD-Rs at 8× speed and CD-RWs at 4×. So you can still send a VideoCD to your family back home, for example, or burn a compilation of polka music—whatever lights your fire.—ANTON LINECKER

MAC STUFF

The Pen Is Mightier

BEHOLD THE NOBLE HIGHLIGHTER, whose fluorescent colors have marked up important documents seemingly since the days of the first cave paintings. But just as other prehistoric office tools have gone by the wayside in favor of more advanced instruments—the mimeograph machine giving way to the color laser copier, the three-martini lunch replaced by the fruit-and-wheatgrass smoothie—perhaps the highlighter must now evolve.

That's the notion behind the new IrisPen II, coming this summer from Image Recognition Integrated Systems (800/ 447-4744, www .irisusa.com). Roughly the size of a Magic Marker, the $129 IrisPen is an electronic highlighter—as you roll it across a document, the internal scanner captures text and enters it into your word processing application. Worried that IrisPen will turn your data into electronic gibberish? The company says new character-recognition technology has improved the accuracy rate to • 99 percent on black-and-white, gray-scale, and color documents. Unlike earlier, serial-port versions of the IrisPen, this model sports a USB connection. True, the IrisPen's case is an undistinguished dark gray, not eye-catching yellow or hot pink. But that seems a small sacrifice for progress.—PHILIP MICHAELS

FILTERING THE WEB

Where DON'T You Want to Go Today?

THE WORLD WIDE WEB CAN OPEN YOUR EYES to material you didn't know existed. The trouble is, not all of that material is suitable for everyone's eyes. That's the argument for Internet-filtering software—applications that block access to potentially objectionable Web sites and prevent young 'uns from wandering into the Web's seedier neighborhoods. But perhaps they do their job too well. We installed three of the more user-friendly filtering applications: ContentBarrier, from Intego ($40; 305/868-7920, www.intego.com); KidSafe, from Apple (free; 800/6927753, www.apple.com); and AOL 5.0's parental controls (subscription prices vary; 800/827-6364, www.aol.com). We used each program's most restrictive settings—turning on all 26 of ContentBarrier's filtering categories; selecting the Children 12 And Under filter in AOL's Web-surfing controls; and using KidSafe's default setting, which lets you visit only sites OK'd by a panel of educators. Then we visited sites that we thought were squeaky-clean. The results? Either the Web is a lot more risqué than we imagined, or Internet-filtering software needs a healthy dose of parental common sense to be truly helpful.—PHILIP MICHAELS

THE NOT-SO-USUAL SUSPECTS

WEB SITE	CONTENT-BARRIER	KID-SAFE	AOL 5.0	VERDICT
CNN	●	○	○	No news is not always good news.
Macworld	○	●	○	Was it something we said, Apple?
Apple	○	○	○	Apple is a pure, blameless creature.
Microsoft Mactopia	○	○	○	It is not wise to anger Mr. Gates.
Napster	●	●	●	Shawn Fanning just can't buy a break.
CaP Cure	○	●	●	Because if there's one thing we have to keep away from the kids, it's cancer information.
Democratic Party	●	●	●	Blame it on that notorious potty-mouth, Senator Russ Feingold.
Republican Party	○	●	●	So much for family values.
Encyclo-pedia Britannica	○	●	●	Perhaps a little learning really is a dangerous thing.

○ =accessed; ● =denied.

PHOTOGRAPH BY DAVID PAPAS; ILLUSTRATION BY JORDIN ISIP

WIRELESS WORRIES

Could Your AirPort Come Under Siege?

WIRELESS NETWORKS BASED ON the same technology as Apple's AirPort have spread throughout homes and offices small and large. That ubiquity has meant greater dependence: most AirPort users would now find doing without this wireless technology cruel and unusual punishment. In fact, the only thing that may match the growing acceptance of the wireless-technology standard known as 802.11b is the widespread confidence users have in their networks' security.

That confidence is misplaced. Several research groups have discovered that the security of the data flitting between your AirPort Base Station and your Mac is not as ironclad as you may assume.

Apple's AirPort technology allows you to create closed networks, which only someone who knows the name of the network can join. You can add a password to your network and thereby encrypt wireless data using a scheme called Wired Equivalent Privacy (WEP).

But WEP is a poorly designed security system. AirPort's WEP was already considered weak because of its short, 40-bit encryption key. But as it turns out, design flaws in WEP mean that using even 128-bit keys makes it only a bit more difficult for miscreants to insinuate themselves into your wireless data. Now it takes a little elbow grease to create the tools to break into a closed, WEP-encrypted wireless network, but it's just a matter of time before automated tools capable of doing precisely that appear on the scene.

When researchers first published their vulnerability findings, the IEEE 802.11 Working Group that approved WEP didn't admit its error, instead trying frantically to downplay the problem's importance.

At the moment, remedies appear to be many months away. And wireless-hardware makers are noncommittal about whether it will even be possible to upgrade existing products to make them secure.

If you use AirPort or any other 802.11b system, you should contact the vendor of your wireless hardware, tell it how much you care about your data's security, and ask when it plans to fix the flaws in WEP. WEP is not secure by a long shot, and the consumers who bought into 802.11b and created the great demand from which vendors are now profiting deserve proper protection for their networks. That said, 802.11b itself is still wonderfully useful technology and should not be shunned merely because of WEP's shortcomings. Knowing precisely how your wireless network and its data are protected will help you decide whether a wired network suits your needs best after all.—STEPHAN SOMOGYI

More Info:
www.isaac.cs.berkeley.edu/isaac/wep-faq.html

Want to find out more about WEP and 802.11? Check out this report by Internet Security, Applications, Authentication, and Cryptography.

LINK

PHOTOGRAPH BY LYDON WADE; PORTRAIT BY BRYAN ADAMS

PRO FILE

PowerBooks Rock

Q&A with BRYAN ADAMS

Bryan Adams has topped the U.S. record charts four times. He has a Grammy and an American Music Award. So what artistic passion is the Canadian rocker pursuing with his PowerBook? Photography. It's clear Adams isn't stuck in the "Summer of '69"; he's a 21st-century Mac-head who uses his PowerBook for just about everything.—ADELIA CELLINI

More Info: www.macworld.com/2001/07/buzz/badams.html

Bryan Adams talks about meeting the pope and jamming with the Who.

LINK

Q: ***What Mac do you currently use?***
A: I use a 500MHz PowerBook G3. It's basically my entire workshop/office/archive/communicator. Lately I've been using it to retouch photographs I did for a fashion campaign by British designer John Richmond. It's such a great computer.

Q: ***Any other computers?***
A: The only other computer I ever had was a Tandy laptop back in the late 1980s. I was even using e-mail back then, if you can believe it. You used to have to take the phone receiver off the cradle and put it in a separate holder to transfer e-mail. Peter Gabriel and Bob Clearmountain were the only people I knew back then that had it.

Q: ***How do you feel about the proliferation of MP3s?***
A: It's just advanced mutated radio play. I wish I could get more upset about it, but I can't. I've been bootlegged so heavily over the years, I just have to laugh. My record company once told me that in 1993, there were two bootlegs to every real record sale of mine on the black market. What can you do? The industry that created the CD format is the same one that's proliferating the copying market.

Product WATCH

RELEASED

- A utility for importing QuickBooks data into accounting programs from MYOB (800/322-6962, www.myob.com): **MYOB Conversion Assistant** sends QuickBooks Pro data to MYOB AccountEdge. Conversion Assistant is available as a free download and can be purchased by mail for $19.
- Imaging software from RealViz (415/615-9800, www.realviz.com): **Stitcher** lets users create fully spherical panoramic images and export them to various formats, including QuickTime 5. It sells for $800 and runs both in Mac OS 9 and natively in Mac OS X.

ANNOUNCED

- The dissolution of a merger deal between Mac router maker Netopia (510/814-5100, www.netopia.com) and wireless-Internet-hardware maker Proxim (800/229-1630, www.proxim.com): The two companies called off their planned merger in the face of a slowing technology sector.
- A 3-D Web technology by Adobe (800/833-6687, www.adobe.com): **Atmosphere** is a professional Web tool for authoring, viewing, and interacting with immersive, virtual 3-D worlds. A Mac beta will be available this summer; the product release is set for late summer.

What's HOT

SPECIAL MAC OS X EDITION

1. **Crowds jam Cupertino store for midnight release of Mac OS X.** *Some people go away disappointed, however, due to a slight mix-up over what X stands for.*
2. **Applications seem to run slower in Mac OS X's Classic environment than in OS 9.** *Well, we're typing this list in Classic, and we haven't noticed any perf . . . orma . . . nce . . . iss . . . ues . . . at . . . a . . . l . . . l.*
3. **Macromedia's FreeHand 10 runs natively in Mac OS X.** *Not to be outdone, Adobe has launched its new "Still Proudly Supporting Mac OS 9" campaign.*
4. **The new iBook ships without Mac OS X installed.** *"We didn't want to frighten the children," Apple executives explain.*
5. **Windows XP bears a striking resemblance to a certain Mac OS.** *"That's preposterous," declares an angry Bill Gates after showing off XP's sporty Aqua interface.*

BEHIND THE SCENES

SELF-MADE ANIMATION

WALKING, TALKING, AND LOOKING PRETTY is a tall enough order for most actors. The last thing they need to worry about is how to operate a computer when they're on camera.

Cue Bob Self. The longtime Mac enthusiast writes mini-applications to run on the computers that appear in movies and on TV. Self's work gives audiences the illusion of a working computer while eliminating the possibility that an actor might click on the wrong button during a critical scene.

UPDATED

- **Office 2001** by Microsoft (800/426-9400, www.microsoft.com): Service Release 1 is a free download that provides enhanced compatibility with both Mac OS 9.1 and Mac OS X's Classic mode. It also features improvements to Office's Word, Excel, PowerPoint, and Entourage applications.
- **Windows Media Player** by Microsoft (800/426-9400, www.microsoft.com): version 7 supports the newest media codecs from Microsoft, Windows Media Audio and Video 8. The new codecs deliver near-DVD-quality video.
- A Shockwave authoring tool by Macromedia (800/470-7211, www.macromedia.com): **Director 8.5 Shockwave Studio** uses Intel Internet 3D Graphics software, so users can deliver scalable 3-D content over the Web to anyone with a Shockwave player. It will cost $1,199; users of version 8 can upgrade for $199; users of prior versions, for $399.—Compiled by MATHEW HONAN

Self's work has appeared on *Gilmore Girls*; *Ally McBeal*; and most notably, *Boston Public*—Self supplies the show's teacher-mocking, Macromedia Flash–like animations that appear on a fictional student Web site.

Self begins his *Boston Public* work after receiving a script from series creator David E. Kelley. Like human actors, the computer needs to follow the script exactly. Self takes a first pass on a blue-and-white 350MHz Power Mac G3 with 900MB of RAM, using Adobe Photoshop and After Effects.

Self imports his Photoshop files into Macromedia Director to create sequences in which a mouse click opens other Photoshop images, mimicking a working computer. If the script requires the actors to type, Self creates animations that display one correct letter for each keystroke—no matter which key the actor hits. The final product goes on a CD, which is what's running whenever actors use a computer in front of the camera.

But you can't just point a camera at a CRT and film away. The monitor's refresh rate must be synchronized with the 24 frames-per-second shooting speed of a film camera—even when the computer screen is just in the background.

Fortunately, Self never has to worry about his computers throwing a star tantrum—unless he programs them to.—GREGG WRENN

ILLUSTRATIONS BY MARK MATCHO; PHOTOGRAPH BY JEFF VACIRCA

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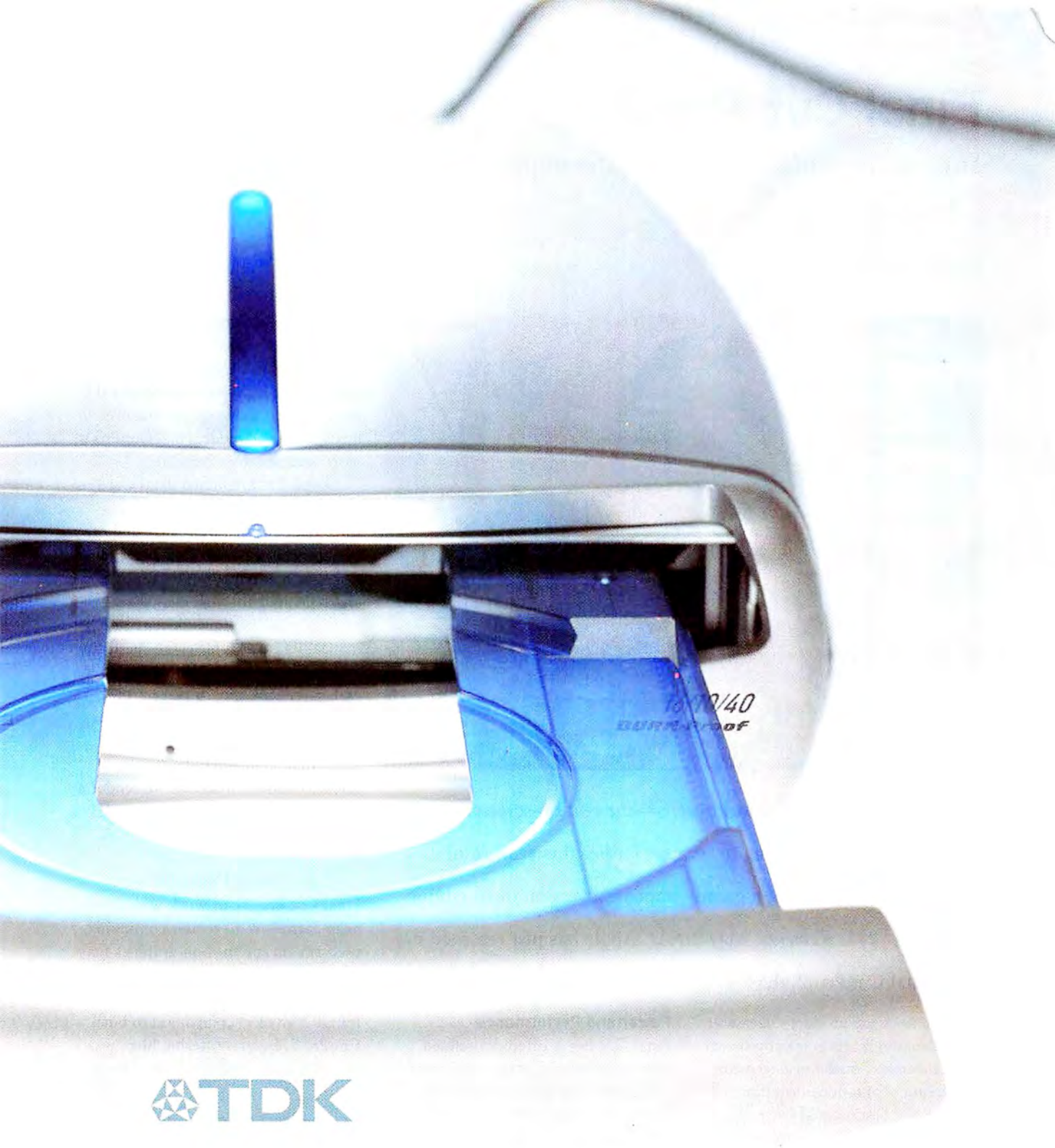

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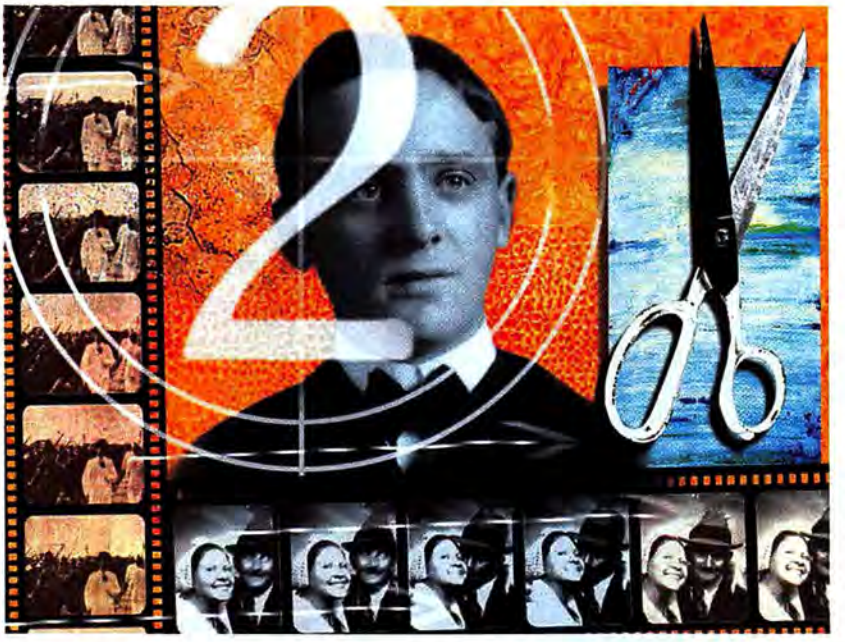
Final Cut Pro 2

Superb Upgrade Enhances Performance, Media Handling, and More

BY JIM HEID



Forget this summer's blockbusters—the real on-screen action is among video-editing programs. Earlier this year, Adobe released Premiere 6, a greatly improved version of its editing software (♦♦♦♦; *Reviews,* May 2001). Apple has just returned fire with Final Cut Pro 2, the first major update of its high-end editing package since the product's release in 1999. Version 2 brings improvements in performance, media management, title creation, and documentation—it includes the best manual I've ever seen, a biceps-building beast of more than 1,400 pages.

When Final Cut Pro debuted, it blew past the slow and buggy Premiere 5. But Premiere 6 is a solid contender, and deciding on a program to buy means weighing Final Cut Pro 2's faster performance and broader capabilities against Premiere 6's lower cost and superior integration with the rest of the Adobe product line.

NAOMI SHEA

Power and Performance

Final Cut Pro 1 offered a refined, responsive user interface and introduced innovations such as windows whose contents update as you move and resize them. Apple didn't tinker with success—Final Cut Pro 2 looks nearly identical to its predecessor (see "Making the Cut"). It also offers the same versatile editing options: you can edit by dragging video clips to the Timeline or Canvas window, and you can use the mouse or a vast array of keyboard shortcuts to adjust clip lengths and perform other editing tasks.

In the new Cutting Station mode, many of Final Cut Pro's advanced features are hidden. Users working on visually simple projects may prefer this mode, as may newcomers—but even in this streamlined mode, Final Cut Pro is more complex than Premiere.

Apple has fine-tuned Final Cut Pro to take advantage of the G4 processor's Velocity Engine circuitry and of multiprocessor Macs. Time-consuming tasks, such as rendering transitions and crunching through complex motion-graphics sequences, are dramatically faster. Apple claims performance gains of roughly 30 percent over earlier versions and 70 percent on multiprocessor machines. In my tests, Final Cut Pro rendered significantly faster than Premiere 6. For example, Premiere took 106 seconds to render a 5-second cross dissolve on a 667MHz Power Mac G4; Final Cut Pro took just 21 seconds.

It gets better. Unlike Premiere, Final Cut Pro 2 can work with third-party hardware to render commonly used effects and motion-graphics features in real time. I tested Matrox's $999 RTMac PCI video card and found it an ideal companion to Final Cut Pro 2. Besides offering huge productivity gains with real-time effects,

FINAL CUT PRO 2

Rating: ♦♦♦♦

Pros: Elegant interface; fast rendering; supports real-time rendering; excellent documentation.

Cons: Weak titling features; can't use Premiere plug-ins; no audio mixer.

Company's estimated price: $999; upgrade, $249

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

the card has a connector for a second monitor and includes a breakout box for connecting analog video gear.

Better Capturing, Better Management

Final Cut Pro's batch-capture features make it easy to log and capture video from DV and other remote-controllable devices. A new scene-detection function makes it easier to work with lengthy DV sequences: choose a command after capturing a segment of video, and Final Cut Pro divides the clip based on the start and stop codes that DV camcorders generate. It's similar to, though more powerful than, the scene-detection feature in Apple's entry-level iMovie.

Keeping track of the files that make up a large project is difficult, but Final Cut Pro has always had strong project-management features. You can segregate content into multiple folder-like *bins,* and you can divide a complex project into multiple sequences, each with its own timeline. (Premiere still lacks the latter capability.)

Final Cut Pro's media-management features are even better than before. You can search for media using a wider variety of criteria and then specify that the program do something with the media it finds. For example, you can search for unused media and delete it from your hard drive to reclaim disk space. Taking a page from iMovie, Final Cut Pro 2 even lets you delete unused portions of individual clips.

Audio and Titling Tweaks

Though Final Cut Pro's audio features have been improved, the video-editing professionals I talked to feel that Apple didn't go far enough: the program now offers stereo volume meters but lacks an equivalent to Premiere 6's audio mixer, which lets you adjust and automate audio levels in real time.

On the plus side, Final Cut Pro now lets you adjust the volume levels of multiple tracks simultaneously. And it can export audio tracks in the OMF (Open Media Framework) format for subsequent sweetening using high-end audio tools such as Digidesign's Pro Tools and Mark of the Unicorn's Digital Performer. Final Cut Pro 2 also includes Peak DV, a scaled-down version of BIAS's digital audio editor.

In Final Cut Pro 1, creating titles was cumbersome; in this version, new titling tools make it easier to create animated titles, such as rolling credits. Final Cut Pro is still limited to working with TrueType fonts, however—the program doesn't support PostScript fonts. And you can't mix and match fonts within a title. Fortunately, version 2 includes Boris FX's Boris Script LTD, a superb plug-in that lets you create graphically complex titles containing multiple type styles.

Making the Cut Final Cut Pro 2's elegant interface is packed with editing features and keyboard shortcuts.

Final Cut Pro or Premiere?

Many things separate Final Cut Pro and Premiere, but foremost among them is *compositing*: the ability to layer multiple video tracks and animate and resize them over time. Final Cut Pro has rich compositing features, whereas Adobe leaves that step to Premiere's sibling, After Effects.

One price of Final Cut Pro's versatility is, well, its price—$999, versus Premiere's $549. Final Cut Pro also demands at least 192MB of RAM (but prefers 256MB); Premiere 6 runs comfortably on a 128MB machine.

Premiere is also tightly integrated with other Adobe products. For example, it can import Illustrator artwork and provides better support for Photoshop files, and After Effects can directly import Premiere projects. Final Cut Pro, while more powerful than Premiere, is more insular.

So which program should you choose? Premiere 6 on its own is the better bargain, but you can also buy it as part of Adobe's Digital Video Collection—for $1,199, you get Premiere, After Effects, Photoshop, and Illustrator: an appealing package if you're outfitting a new editing system.

Premiere is also easier to learn and lets you choose from numerous third-party video and audio plug-ins, few of which work with Final Cut Pro. And unlike Final Cut Pro, Premiere is available for Windows, making it a potentially better choice for cross-platform studios.

But for video professionals, Final Cut Pro is the program to buy. It's far better suited to long-form projects, thanks to its superior media-management features and its ability to divide a lengthy project into multiple sequences. Its compositing features aren't as rich as those of After Effects, but many users will be willing to make that sacrifice for the convenience of being able to work in one program.

Final Cut Pro has also become hugely popular among film and TV professionals. In Los Angeles, for example, there's a 600-member Final Cut Pro user's group (www.lafcpug.org). Premiere just doesn't enjoy that kind of community among video pros.

Macworld's Buying Advice

Final Cut Pro 2 isn't a slam-dunk winner over Adobe Premiere 6, due to Premiere's lower price, audio mixer, and ties to other Adobe products. Still, it's a superb sequel. Its enhancements address the needs of video professionals, and its performance on a G4 Mac is stunning. Final Cut Pro's unmatched depth of features has made it the editor of choice for video pros, and version 2 will only strengthen that position. **m**

G4 Upgrade Cards

Give a Speed Boost to Your Power Mac G3

BY DAVID READ

Perhaps you've recently upgraded to Mac OS X, and you notice your once acceptably fast blue-and-white Power Mac G3 beginning to show its age. Luckily, this Mac's 100MHz system bus makes it a prime candidate for a processor upgrade, which can give you nearly top-of-the-line performance. Macworld Lab examined PowerLogix's 450MHz PowerForce G4 ZIF card; Sonnet Technologies' 400MHz and 500MHz Encore ZIF G4 cards; and XLR8's 400MHz, 450MHz, and 500MHz Mach Speed G4 ZIF MPe cards. We found that although these cards performed similarly (relative to their speeds), those from Sonnet and XLR8 offered the most extras.

G4 or Not G4?

A G4 processor has a subprocessor called AltiVec (Apple calls it the Velocity Engine), which can dramatically boost performance—but only in applications designed to take advantage of it (such as Adobe Photoshop and some other image-editing programs, MP3 encoders, and video-editing packages). Not many applications are optimized for AltiVec, but if you happen to work with one of them every day, you'll want a G4. And Mac OS X uses the Velocity Engine much more than Mac OS 9 does, so if you're planning to switch to OS X, a G4 upgrade may be in order.

Anatomy of an Upgrade

A G4 processor cannot work in a blue-and-white Mac without a firmware patch, which modifies the ROM, preparing the motherboard for the upgrade. But only Sonnet provides a method for removing the patch; you would have to contact the other companies for a removal procedure (at press time, each was developing this procedure and was hesitant to release it).

XLR8 had the best installation package, providing all of the necessary tools and excellent instructions. Sonnet's instructions were also very well written—especially for users with little experience inside a Mac—with clear, descriptive illustrations and a minimum of jargon.

Controlling the Cache

Each card has a 1MB L2 cache that, by default, runs at half the processor's speed. (The L2 cache stores frequently used instructions, allowing the processor to operate with greater efficiency.) All the cards come with software that monitors the cache, but the amount of control provided differs from company to company. PowerLogix and XLR8 provide control panels, but XLR8's gives you more control over the cache's speed and other performance parameters. Additionally, XLR8's control panel checks the cache and sets it to the

Clocking the Velocity Engine

Macworld LAB TEST

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

	SPEEDMARK 2.1	SOUNDJAM 2.5.2	ADOBE PHOTOSHOP 6.0.1		QUAKE III
	Overall Score	MP3 Encode	Gaussian Blur	Unsharp Mask	Normal
Sonnet Technologies Encore ZIF G4 400MHz	120	2:24	10	14	30
XLR8 Mach Speed G4 ZIF MPe 400MHz	127	2:21	9	13	32
PowerLogix PowerForce G4 ZIF 450MHz	128	2:06	9	12	34
XLR8 Mach Speed G4 ZIF MPe 450MHz	134	2:15	8	12	34
Sonnet Technologies Encore ZIF G4 500MHz	137	2:02	9	12	33
XLR8 Mach Speed G4 ZIF MPe 500MHz	140	**2:01**	8	11	35
Apple Power Mac G3/450	*127*	*3:00*	*15*	*18*	*31*
Apple Power Mac G4/466	***157***	*2:02*	***6***	***8***	***46***
	Better ▶	◀ Better	◀ Better	◀ Better	Better ▶

Speedmark 2.1 scores are relative to those of an iMac 350 MHz (1999), which is assigned a score of 100. SoundJam scores are in minutes:seconds. Photoshop scores are in seconds. Quake scores are in frames per second. We tested each card in a Power Mac G3/450 (blue and white) with Mac OS 9.1, 128MB of RAM, a default system disk cache, and virtual memory enabled. 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. For more information on Speedmark, visit www.macworld.com/speedmark.—**Macworld Lab testing by Jason Cox**

G4 Upgrade Cards Compared

COMPANY	PRODUCT	MOUSE RATING	COMPANY'S ESTIMATED PRICE	CONTACT	PROS	CONS
Sonnet Technologies	Encore ZIF G4 400MHz	4½	$349	800/786-6260, www.sonnettech.com	Good documentation; flexible firmware package; excellent value.	No tools provided.
XLR8	Mach Speed G4 ZIF MPe 400MHz	4½	$399	770/564-5682, www.xlr8.com	Excellent installation package; MP enabled; good software; excellent value.	Firmware-patch uninstaller not included.
PowerLogix	PowerForce G4 ZIF 450MHz	3	$449	877/849-2504, www.powerlogix.com	Easy to install; offers good performance boost.	Firmware-patch uninstaller not included; no tools provided.
XLR8	Mach Speed G4 ZIF MPe 450MHz	3½	$449	770/564-5682, www.xlr8.com	Excellent installation package; MP enabled; good software.	Firmware-patch uninstaller not included.
Sonnet Technologies	Encore ZIF G4 500MHz	4	$499	800/786-6260, www.sonnettech.com	Relatively inexpensive; good documentation; robust firmware package.	No tools provided.
XLR8	Mach Speed G4 ZIF MPe 500MHz	3½	$599	770/564-5682, www.xlr8.com	Excellent installation package, MP enabled; good software.	Pricey; firmware-patch uninstaller not included.

fastest possible settings (even if they exceed the default settings) automatically and reliably. Sonnet's software is invisible to the user and sets the cache settings to the proper speed during startup. If you don't intend to experiment with overclocking—driving the cache to a higher speed than is recommended, to squeeze out more performance—Sonnet's arrangement will be preferable.

Pedal to the Metal

XLR8's 450MHz Mach Speed G4 ZIF MPe had a slightly better Speedmark score than PowerLogix's 450MHz PowerForce G4 ZIF; however, the difference was negligible—the Mach Speed beat the PowerForce by only a second when performing a Gaussian blur in Adobe Photoshop, and it even fell a few seconds behind when encoding an MP3 in SoundJam. The performance of both 450MHz upgrade cards was close to that of the 450MHz Power Mac G3 in our Speedmark and Quake III tests, but the upgrades' speeds far exceeded the G3's when it came to Photoshop, which is optimized for the G4.

The Speedmark subtest that looked specifically at disk speed confirmed that the Power Mac G4, with an ATA/66 controller and a newer hard drive, has much better disk performance than the blue-and-white Power Mac G3, with its slower SCSI hard drive. (The faster disk is part of the reason that the 466MHz Power Mac G4's scores were better than those of the 500MHz upgrade cards.) Even if you upgrade your G3 and your hard drive, you'll be limited by the slower ATA bus.

The upgrades from XLR8 are multiprocessor enabled (MPe). If you purchase a 400MHz MPe ZIF, you can use it as one of the processors in XLR8's multiprocessor upgrade.

Macworld's Buying Advice

XLR8's upgrades come with all of the tools you need, and its products can later be incorporated into a multiprocessor upgrade. Sonnet's good documentation and low prices make its upgrades exceptionally attractive. And software that works without intervention, along with easily removable firmware patches, makes Sonnet's upgrade cards excellent choices for those who don't enjoy tinkering with their machines. The 400MHz cards from these two manufacturers are sensible investments. However, the prices of the faster cards begin to approach those of used or refurbished Apple G4s, which have faster hard drives and CD-ROM drives. The G4 upgrade card from PowerLogix is technically sound, but it has no distinguishing features, and its rough documentation makes it less appealing than the others we tested. **m**

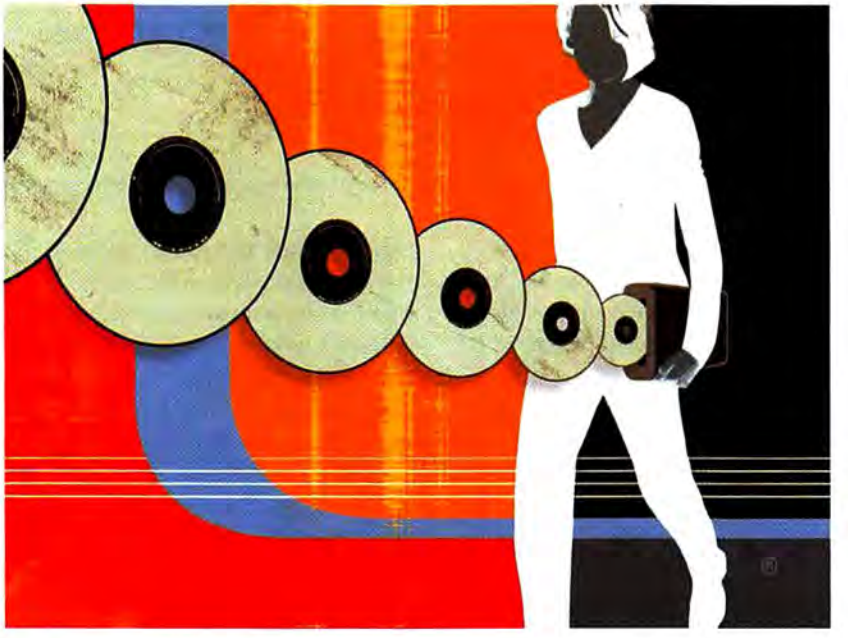
From left: The XLR8 Mach Speed G4 ZIF MPe 400MHz, the PowerLogix PowerForce G4 ZIF 450MHz, and the Sonnet Technologies Encore ZIF G4 400MHz

GIBSON

CD-Burning Software

Powerful Program Toasts the Competition

BY JONATHAN SEFF



JOHN RITTER

Not long ago, CD-RW drives were too costly for all but mammoth corporations, ivy-covered universities, and the planet's wealthiest residents. Now they are plentiful and affordable—Apple is even building them into many of its new Macs. And you have a few choices when it comes to software: CharisMac's Discribe is bundled with Sony drives; Roxio's Toast comes with most others. If your Mac has a built-in CD-RW drive, it will work with Apple's free iTunes and Disc Burner, but you'll get the most out of your drive if you buy a full version of software designed just for burning CDs.

Two packages now available for the Mac are Toast 5 Titanium and Discribe 4. (NeroMax, the Mac version of the popular Windows program Nero, was released in May [too late to be included in this review].) Both programs have many more features than their free counterparts, including the ability to duplicate discs, burn cross-platform and bootable discs, and burn multiple sessions on a disc. But of the two, Toast has more to offer.

At Face Value

When you start Toast, you're greeted by a very refined, Aqua-like interface (a free OS X update should be available soon) with a few minor inconsistencies: similar commands are sometimes located in different places.

Discribe's interface is simpler but looks amateurish. The icon for choosing an audio CD is a poorly bitmapped picture of two eighth notes. And you have to set preferences for each CD you burn.

DISCRIBE 4.0

Rating: ♦♦♦

Pros: Performs basic burning functions well; flexible control over disc verification; accurate data-size representation.

Cons: Limited support for FireWire and USB drives; rough interface; limited number of burning formats.

Company's estimated price: $100

Company: CharisMac, *800/487-4420*, **www.charismac.com**

TOAST 5 TITANIUM

Rating: ♦♦♦♦½

Pros: High-quality MPEG-1 encoding and VCD burning; allows burning in the background; on-the-fly MP3 burning; support for DVD drives.

Cons: Minor interface inconsistencies.

Company's estimated price: $90

Company: Roxio, *800/518-2432*, **www.roxio.com**

Under the Hood

Both programs support Burn-Proof, a feature that momentarily pauses your burn if it detects potential problems. Keep in mind, though, that your drive must also incorporate this technology—not all do. In Toast, you make the decision to turn on Burn-Proof each time you start to burn—important because you don't want to use it when burning an audio CD (interrupting a drive in process can result in audible glitches); in Discribe, you select the Burn-Proof setting (in the Preferences menu) independently. If your drive doesn't support Burn-Proof, Toast lets you adjust the RAM cache used in burning (to reduce the chances of dropping data), an option Discribe doesn't offer.

Toast lets you burn in the background, so you can surf the Web or

Aqueous Interface With Toast 5 Titanium, you can burn many types of discs, including Video CDs.

perform other tasks while a burn is in progress. (This was available in version 4 but was not documented.)

Discribe lets you choose to verify the integrity of your discs before burning. Fortunately, the option is turned off by default, because verification is time consuming. In Toast, you must eject your disc within seconds after it's burned or it will automatically be verified. You can abort the process, but it's a hassle.

Toast supports most CD-RW drives. CharisMac lists about 200 supported drives on its Web site, but only 10 of them are FireWire or USB drives. (Discribe didn't recognize the 12× QPS FireWire drive or Formac's 16× FireWire drive.)

Bits and Bytes

Both programs can burn HFS and ISO9660 formats, Mac-PC hybrid discs, and bootable Mac volumes; Toast adds support for HFS+ in Mac and hybrid formats.

Toast also includes some functionality of the discontinued Toast-DVD, so you can use it with DVD-RAM, DVD-R, and DVD-RW drives (including those in new Macs), too. And you can use Toast to make backups to Digital Linear Tape (DLT).

When you drag your data into Toast's main window, you see the size of individual files and their icons, but you see the true total only when you click to begin burning your CD. Discribe shows you file sizes and the disc total before you burn.

Play That Funky Music

In my mind, the coolest thing about CD-RW drives is being able to burn your own music CDs to play in CD players. Both Discribe and Toast let you do just that—each with its own quirks, however.

With Discribe, you can drag only *files* to the CD window. If you try to drag a *folder* containing files, Discribe will change your disc to HFS format, treating all of your audio files as data. Toast has no such problem; it will even import only the audio in a mixed folder containing audio and text.

Toast can burn either AIFF or WAV files directly to CD. And it can convert MP3 files to the audio standard for CD players (16-bit, 44.1kHz, stereo) without having to expand them. That's great if your hard drive doesn't have an extra 600MB to 700MB of space per disc to handle the expanded files. (Burning compressed MP3 files at more than 4×, however, will result in unusable discs.) Discribe can handle both WAVs and MP3s, but it must first convert them to AIFFs.

Both come with utilities for recording analog audio—such as LPs—to your computer: Toast has CD Spin Doctor, and Discribe has Audio Scribe. CD Spin Doctor lets you hear what you are recording through your Mac's sound system. When finished, it displays the waveform of your file, which helps when you define and name your tracks. If you like, you can let the program define the tracks automatically—it searches for places in the waveform where the signal goes flat. Spin Doctor even figures how much recording time you have left on your selected drive. Once you have a large file on your Mac, you can apply filters to clean up pops and clicks.

Made for TV

One area that Toast has all to itself is burning in the Video CD (VCD) format. Toast has long been able to burn VCDs—about an hour's worth of 320-by-240-pixel MPEG-1 video that will play on most computers and newer set-top DVD players. But previous versions of Toast could handle only material in the Toast-Ready subset of the VCD format. Toast 5 accepts any White Book–compliant MPEG-1 file (White Book is the standard defining VCD). But that's not even the best part.

Toast 5 has a built-in MPEG-1 encoder—the same technology in Terran Interactive's $599 Cleaner 5 (★★★★½; *Reviews*, February 2001). So in addition to creating VCDs from existing streams, it can take any QuickTime file or iMovie and create a VCD from it. The process isn't very fast; encoding a one-minute QuickTime movie took 5 minutes and 45 seconds on a G4 and 15 minutes on a blue-and-white G3. But the encoder would cost a lot more purchased separately, so it's hard to complain.

Although a VCD's quality is far beneath that of a DVD, the only hardware you need to create one is a common CD-RW drive.

Macworld's Buying Advice

Discribe is a relatively easy-to-use program that performs simple tasks well, but Toast is a much richer, more powerful application. Its VCD encoding and burning alone are worth its price (which is $10 less than Discribe's). But Toast includes a lot more: extra CD- and DVD-burning capabilities, on-the-fly MP3 burning, bundled programs, and even a Y-cable for connecting a Mac with audio inputs. **m**

Dutiful Scribe Discribe gives you control of basic functions through a simple interface.

iDVD 1.0

Apple Finally Releases Easy-to-Use, If Buggy, DVD-Authoring Software

BY JASON SNELL

Ever since Apple brought FireWire to the Mac and introduced its iMovie video-editing software, the Macintosh has been at the forefront of the digital-video revolution. But one piece of the puzzle was missing: the ability to output digital video to DVD, the most popular digital video-playback format around. With the introduction of iDVD—and the just-released DVD Studio Pro, Apple's $999 pro-level product—Apple's digital-video story is finally complete. But for all its promise, iDVD is rife with bugs and quirks that keep it from being a pleasure to use.

Interface Builder

If you've ever seen a DVD, you know why Apple had to provide special authoring software to go with the DVD-burning hardware on the new 733MHz Power Mac G4. DVDs are more complex than videotapes, with interfaces that have selectable items and clickable buttons for playing movies, enabling special features, and viewing other information. Video files must be compressed into the MPEG-2 format before being written to a DVD (iDVD does this automatically).

iDVD eases the authoring process with a simple drag-and-drop, button-based interface. The main window contains a preview of what you'll see on the current screen of your DVD. At the bottom is a tool bar with buttons you use to add items to the interface. To add a movie, simply drag its file from the Finder; a button representing the movie will appear in the DVD interface. However, you can't create movies with multiple chapters or stitch individual movie files into a single movie. While you can drag buttons to reorder them, you can't move them from their predefined locations on the screen. And each iDVD screen can contain only six items (although you can create subfolders if you want to add more).

Likewise, it's easy to create collections of still images by clicking on the Slideshow button. Unfortunately, when I dragged 50 JPEG images into the Slideshow window, some appeared out of sequence. You can reorder only one item at a time in this window; worse, the program quit repeatedly when I tried to edit my slide show.

Preview and Burn

When you're ready to see how your DVD will behave, click on the Preview button; the iDVD window turns into a simulated DVD-player environment, complete with a floating palette that emulates a TV remote control. Once you're satisfied with your project, click on the Burn DVD button. A helpful gauge shows how much space is left on a disc. (iDVD can write only about one hour of video to each disc.)

The program took about two and a half hours to burn my near-full disc, and the end result was impressive but slightly quirky. When I viewed the disc using Apple's DVD Player software, I could not exit to a menu from any of my slide shows. On my Panasonic home DVD player, the slide shows worked fine, but the titles' left edges were cut off—despite assurances from iDVD that the buttons and text were within the screen's "TV Safe" zone.

Sneak Peek Use iDVD's Preview command to see how your final product will behave.

Macworld's Buying Advice

iDVD makes the complicated task of creating DVDs impressively easy, but it's far from perfect. If you're thinking about buying a new Power Mac G4 just to get iDVD, beware: you can make it work, but not without a good deal of frustration. **m**

iDVD 1.0

Rating: ★★½

Pros: Easy to use; attractive results.

Cons: Limited interface control; awful Slideshow interface; prone to crashes; incompatibilities with Apple DVD Player.

Company's estimated price: Free (available only on the Apple Power Mac G4/733MHz with SuperDrive)

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

CalculationCenter

A Gentle Introduction to the Power of Mathematica

BY CHARLES SEITER

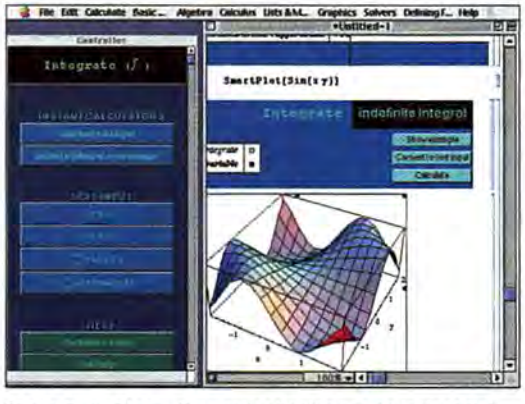
Wolfram Research's Mathematica (♦♦♦♦½; www.macworld.com/2001/02/05/reviews/mathematica.html) is an undeniably powerful program for performing numeric and symbolic calculations. But its interface—which presents you with only a blank page and some symbol palettes—can leave new users wondering how to proceed. Wolfram's newest product, CalculationCenter, is an attempt to make the power of Mathematica accessible to new users with just a few minutes' practice. It's the first math program you can use without a manual, and it's the best introduction yet to symbolic math computation.

Show and Tell

At the heart of CalculationCenter is an interactive help feature called Instant Calculators. Nearly every item in the simplified main menu of calculation modes—Basic Math, Algebra, Calculus, Lists & Matrices, Graphing, Solvers, and Defining Functions—calls up an Instant Calculators wizard that offers an example of the calculation, accepts and formats input for a problem, and executes the calculation. The Instant Calculators cover such a wide range of problems, you may find that your day-to-day use of CalculationCenter amounts to simply invoking a few of the Instant Calculators wizards to solve problems quickly.

Because the program records the results of calculations in a standard Mathematica notebook, it's easy to run an Instant Calculators example and then modify it in the notebook to solve your particular problem. The Instant Calculators system also greatly simplifies plotting, carefully walking you through details of 3-D parametric plots and offering, for simpler cases, a SmartPlot option that handles the details for you.

Although CalculationCenter is an introductory product, it's still based on Mathematica, so all functions work in symbolic as well as numeric calculations. The overall scope of the functions is good, if somewhat uneven—for example, Lists & Matrices has a choice for eigenvalues but none of the advanced matrix-decomposition types found in Mathematica.



Three Easy Steps CalculationCenter has an Instant Calculators wizard for nearly every function. Click on a button to see an example, format an entry, or run a calculation.

Getting Around

CalculationCenter reads standard Mathematica notebooks such as those available from Wolfram's MathSource, the giant online repository of user-contributed notebooks. The program doesn't accept notebooks that call on functions from Mathematica's Standard Packages, but most of the MathSource packages we tested ran flawlessly in CalculationCenter. Using MathSource notebooks lets you add a variety of functions—such as statistics, business, and engineering—that CalculationCenter lacks.

One area that needs a bit more work is error handling. For example, if you accidentally enter **Sin[x}**, you'll be treated to half a page of incomprehensible messages that fail to point out the actual typo. Mathematica veterans will be unfazed by such messages, but a product for beginners should do a better job of handling errors.

Macworld's Buying Advice

CalculationCenter gives new users most of the power of Mathematica without requiring a Ph.D. in math. Thanks to the innovative Instant Calculators feature, you can start working right away without consulting a manual. For a wide range of technical professionals, and for most college course work, this is the computational program to buy. **m**

CALCULATIONCENTER

Rating: ♦♦♦♦

Pros: Simple access to Mathematica functions; easy graphing; reads most MathSource notebooks.

Cons: Occasionally produces inscrutable error messages.

Company's estimated price: $295

Company: Wolfram Research, *800/965-3726*, **www.wri.com**

SmartSound Sonicfire Pro 2.0

Soundtrack-Creation Application Now Easier to Use

BY CHRISTOPHER BREEN

Those who've attempted to add background music to digital movies know that it's difficult to find a piece of music exactly as long as a particular scene. Sonic Desktop Software offers a solution to this vexing problem with its SmartSound line of soundtrack-creation software, which automatically creates royalty-free background scores of any length. Previous versions didn't allow you to view your movie from within SmartSound as you created a score; instead, you had to run the movie in a separate application, note the length of time you wanted the soundtrack to play, and then create the soundtrack in SmartSound. Sonicfire Pro, the latest addition to the SmartSound family, improves upon this approach by allowing you to score a variety of video types—including QuickTime, DV, and AVI—directly within the Sonicfire Pro application.

Smart Sound

Like previous versions of SmartSound, Sonicfire Pro includes a collection of royalty-free music in a variety of styles. Each musical piece is divided into small blocks; when you ask Sonicfire Pro to create a piece of music that's 37 seconds long, for example, it strings together the necessary number of blocks in a way that makes musical sense.

The program creates these strings of music via its Maestro feature, an assistant that asks you to select the category of music you want (action or background, for example), a style of music within that category (such as jazz or classical), the soundtrack's length, and a thematic variation. Once you've satisfied Maestro's curiosity, it creates a soundtrack that suits your needs.

Smarter Sound

Sonicfire Pro's interface comprises Timeline, Blocks, and Video windows. The musical snippets Maestro helps you create appear as colored bars in the Timeline window; you can expand or contract these snippets by dragging the edge of a bar. The Blocks window contains the individual musical blocks that make up the snippet. The Video window, as its name hints, is for video display.

To score your video, simply start playing your movie and add markers where you'd like music to begin and end, and then run Maestro to audition different scores. As you add bits of music to the video, you can change the score's volume by adding adjustment points to the volume timeline and moving them to create fades or more-abrupt dynamic changes. Because you can change the sound level only via this graphical interface, however, fine-tuning your score's volume can be difficult.

Included with the program are two music CDs in a format compatible with Sonicfire Pro. Additional collections of music are available for purchase (they cost $70, for the 22kHz version, and $130, for higher-quality 44kHz files). I sampled four of these CDs and found the quality excellent throughout. You can also turn your own music into SmartSound-compatible files, though only music with a relentlessly steady beat works well with SmartSound's blocking scheme.

Audio with Visuals With SmartSound Sonicfire Pro's Video window, it's easy to sync your music and video.

Macworld's Buying Advice

Sonicfire Pro 2.0 is as easy to use as other members of the SmartSound family, and like its siblings, it lets you create and customize dynamic, royalty-free musical scores for your video projects. If your movies would benefit from musical accompaniment, you should certainly give Sonicfire Pro 2.0 a try. **m**

SMARTSOUND SONICFIRE PRO 2.0

Rating: ♦♦♦♦

Pros: Easy to use; high-quality scores; lets you see video while adding music.

Cons: Difficult to make fine adjustments to volume level.

Company's estimated price: $349

Company: Sonic Desktop Software, *800/454-1900*, **www.smartsound.com**

PowerShot G1 and Pro90 IS. Digital Gets Serious.

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NetBarrier 2.0

Firewall Fights Off Network Crackers and Privacy Invaders

AS IF NETWORK CRACKERS weren't hassle enough, now we must contend with miscreants who want to pry into our Web-surfing habits and inundate us with viruses and ads. Intego's NetBarrier personal firewall protects you. New in version 2.0.2 are handy tools that block annoying advertising and protect privacy. And the program's price, $50 ($100 less than the cost of version 1.0), makes it an incredible bargain.

Rating: ♦♦♦♦½

Pros: Comprehensive protection; spam filtering; cookie and banner-ad blocking.

Cons: No log-analysis capability.

Company's estimated price: $50

Company: Intego, *877/946-8346*, **www.intego.com**

NetBarrier keeps out intruders, blocks network attacks, and filters the sludge from your daily Internet stream. An array of preset configurations lets you set up the program with a single click, and in-depth settings give power users control over details.

NetBarrier can alert you when a site you're visiting attempts to retrieve personal information, such as your credit card number. The program logs these and other security events, though its log messages can be cryptic. Other features let you keep an eye on traffic levels and protocols. A new spam filter deletes annoying messages from your mail server, and an extensive cookie-monitoring feature lets you control who can send you cookies. The program can also selectively block banner ads and pop-up ad windows.

Cookie Monster NetBarrier keeps cookies under tight control, preventing companies from tracking your surfing habits.

Macworld's Buying Advice

Less expensive and more capable than Symantec's Norton Personal Firewall (♦♦; *Reviews*, May 2001), and with an easily navigable interface, Intego's NetBarrier is the best personal firewall on the market today.—MEL BECKMAN

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..."

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Repairs disk problems such as disks that won't mount, files you
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Boswell 1.0

Personal Text Organizer Short on Import Tools

PICTURE AN ASSISTANT able to retrieve text for you in an instant: that's the premise behind Copernican Technologies' Boswell 1.0.2, a database in which you can store text clippings as large as 32K.

Boswell—which requires only 5MB of memory—was designed to be kept running, ready to accept or retrieve text. Boswell's electronic manual warns you not to try to learn the program by trial and error, and that's good advice—it took me two readings to familiarize myself with the terminology. In Boswell-speak, text blocks are called "entries," and they reside in a temporary storage area, the Journal, until they're transferred to the permanent Archive (once you put an entry there, you can't edit or delete it). Boswell's powerful cataloging functions make it easy to group related entries, so it's a snap to find, for example, all e-mail messages from your cousin Agnes that include the word *fruitcake*.

Personal Librarian Fields in the header area above an entry describe its contents.

Alas, the only way to transfer text into Boswell is to cut and paste it, drag it from another application, or import it from a text file, so users who want the program to store all of their Microsoft Word documents or Entourage e-mail messages have some tedious work in store.

Rating: ½

Pros: Powerful search capabilities; easy on memory.

Cons: Expensive; needs additional import tools.

Company's estimated price: $130

Company: Copernican Technologies, *831/429-1775*, **www.copernican-tech.com**

Macworld's Buying Advice

Though free utilities such as Sherlock let you search for files by content, having a separate, permanent record of your text has advantages. But as it is now, Boswell may be more trouble than it's worth.—FRANKLIN N. TESSLER

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Stata 7

Statistics Program Offers Power at a Price

Rating: ♦♦♦½

Pros: Powerful; fast; extensible.

Cons: Procedural language is difficult to learn; graphing options lag behind the competition's; no OLAP support.

Company's estimated price: $995

Company: Stata, *800/782-8272*, **www.stata.com**

MOST STATISTICS PACKAGES, such as SPSS's eponymous SPSS and SAS Institute's JMP, have entered the new millennium as interactive menu- and dialog-driven programs. In contrast, Stata is still reminiscent of a 1970s mainframe application. This otherwise powerful program relies on a procedural language for all interactions with your data, making for a substantial learning curve.

A Different Approach

Stata does have a Mac interface, which it uses for relatively infrequent actions, such as setting preferences, opening files and windows, and printing. You'll spend most of your time in the Command window, typing and editing procedural instructions for displaying data, generating statistics, and creating graphs. The program routes all text output to a scrolling window; graphs appear in another window. Constructing and typing commands is no harder than it was with the early statistics packages, but this approach occasionally results in typos and syntax errors that users of menu- and dialog-driven programs never have to deal with.

To aid in the learning process, the program comes with 15 pounds of manuals, a series of noninteractive tutorials, and an extensive help system. Stata is extensible: you can modify the statistical procedures or create new ones. You can also capture a log of your session and use it as the basis for an executable *do-file* (a batch file used to automate a series of analyses).

Alas, Stata 7 lags behind the competition in graphics and formats, supporting only eight 2-D graph types (plus combinations). For a slightly lower price, SPSS 10 (♦♦♦♦½; *Reviews*, March 2001) can produce more than twice as many graph types, lets you edit graphs, and can generate attractive 3-D graphs suitable for business reports. And while Stata offers an impressive array of statistics and options, it doesn't support OLAP (online analytical processing) cubes as SPSS 10 does.

Type or Click You can type procedure names, variable names, and options in Stata's Command window or choose them from the Review and Variables windows.

Macworld's Buying Advice

Stata 7 isn't for casual users or novice statisticians. But if you're a full-time researcher or statistics professional who can devote the time needed to learn Stata, it's well worth considering. However, if you prefer a more interactive, menu-driven approach—one that doesn't rely on memorizing commands and syntax—you'll be happier with SPSS.—STEVE SCHWARTZ

Lyra2

MP3 Player Adds FM Tuner, Retains Bulky Hardware

THE LATEST entrant in the already crowded field of portable MP3 players, RCA's Lyra2 has its share of cool features, including great sound and a new FM tuner. It comes with accessories that are often optional with

other players, including a tiny remote control for adjusting volume and directing playback; a power cable that plugs into your car's cigarette lighter; and a cassette-shaped adapter that lets you play music from the Lyra2 via a cassette deck.

Unfortunately, it also has more than its share of flaws. Transferring MP3s is a hassle: most MP3 players connect directly to the Mac, but with the Lyra2 you have to remove the 64MB flash memory card, insert it in the USB-based writer (which is almost as big as the player), and then use the bundled MusicMatch Jukebox software to transfer the files. Transfers are sluggish: a track that zipped into the Sonicblue Rio 600 in 12 seconds took 22 seconds to transfer to the Lyra2. And next to Apple's iTunes (which doesn't support the Lyra2), MusicMatch Jukebox is downright ugly.

Macworld's Buying Advice

The Lyra2 is priced to compete with other MP3-FM combo players. But if you don't need FM, the $220 Rio 600 is a better MP3 player—it's less expensive, faster, and supported by iTunes.—JIM HEID

Rating: ♦♦♦

Pros: Great sound; lots of goodies, including a remote control.

Cons: Slow transfers; external hardware is bulky.

Company's estimated price: $299

Company: RCA, *800/336-1900*, **www.lyrazone.com**

2-Minute Drill

Unpolished Sports-Trivia Game

ON ESPN'S *2-Minute Drill* TV game show, sports celebrities bombard contestants with sports-trivia questions. Unfortunately, the CD-ROM of the same name fails to bring the fast-paced excitement of the show to your Mac's screen.

In the tradition of games such as Berkeley Systems' You Don't Know Jack, 2-Minute Drill features clever audio commentary from the host of the TV series, Kenny Mayne. But all

we get from Mayne are non sequiturs; neither Mayne nor his celebrity guests actually read the questions aloud. That makes the photographs of the celebrities a bit silly, since their voices merely shout out the occasional irrelevant comment.

And although the questions are challenging, they started to repeat after only two games. Another reason this game lacks the excitement of the real thing is that there's no multiplayer mode. In addition, you are forced to deal with awkward key combinations as you rush to answer as many questions as possible in two minutes.

Macworld's Buying Advice

With repeating questions, no multiplayer mode, and poor use of audio, 2-Minute Drill is a weak sports-trivia game and a pale imitation of its TV counterpart.—JASON SNELL

Rating: ♦♦

Pros: Challenging questions.

Cons: No audio for questions; clumsy key combinations; no multiplayer mode; repeating questions.

Company's estimated price: $40

Company: ESPN The Games, *888/782-4186*, **www.espnthegames.com**

SOFTWARE UPDATES

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Adobe Acrobat Reader 5.0
New version of PDF viewer

Adobe PostScript printer driver 8.7.2
Works with Carbon applications

America Online 2a
Beta OS X client for AOL

Apple Mac OS X 10.0.1
Update adds USB drivers

Apple Darwin OS 1.3.1
Open-source binary OS X core

Connectix Virtual PC 4.0.2
Bug fix for PC emulator

Dantz Retrospect client 1.0b1
Beta OS X backup client

DIMM First Aid 1.0
Checks RAM compatibility with Apple's firmware update

DivX Player 1.0b10
Beta DivX media player

Fizzilla 4/17/01
Carbon version of mozilla.org's browser

FoldersSynchronizer 2.1
Carbon version of backup shareware

FWB Hard Disk ToolKit 4.5
Adds support for FireWire RAID

GraphicConverter 4.0.7
Bug fix for Carbon version

Kensington MouseWorks OS X 1.0b2
Beta OS X driver for mice and trackballs

LaCie Silverlining Pro 6.4.1
Now iTunes-aware

MacJanitor 1.0
Runs OS X system-maintenance scripts

OpenOffice 04/11/01
Source code for Sun's productivity suite

OpenUp 3.1
Cosmetic upgrade to OS X expander

PowerLogix ProfilerX 1.0b1
Enables backside cache with OS X

PrintToPDF 2.2.2
Bug fix for conversion shareware

Sorenson Video 3.0b
Developer edition codec

SoundJam MP Plus 2.5.3
Adds support for Rio player

Timbuktu Pro X 1.0b
Beta OS X file-exchange software

VST FireWire Updater 2.3
Adds support for DV capture

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- ♦♦♦ MyPalm
- ♦♦♦♦ ScheduleOnline
- ♦♦♦ Yahoo Calendar

Racing wheel
- ♦♦♦½ Saitek R100 USB Wheel

Professional monitor
- ♦♦♦♦ Personal Calibrator V

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- ♦♦½ Andrea Electronics NC-7100
- ♦♦♦ Parrott Aruba
- ♦♦♦ Parrott Caribbean
- ♦♦♦ Parrott Jamaica
- ♦♦♦ Plantronics DSP-100
- ♦♦♦½ Plantronics DSP-300
- ♦♦♦♦ Plantronics DSP-400
- ♦♦♦♦ Plantronics DSP-500
- ♦♦♦ Telex H-531
- ♦♦♦½ Telex H-831
- ♦♦½ Telex M-560

Color laser printer
- ♦♦♦½ HP LaserJet 4550N

Teaching software
- ♦♦♦ ThemeWeavers: Animals
- ♦♦♦ ThemeWeavers: Nature

USB MIDI controller
- ♦♦♦½ Tascam US-428

Music-assembly software
- ♦♦♦½ Phrazer 1.0

Portable photo printer
- ♦♦♦ Olympus Camedia P-200

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- ♦♦♦♦ Puzzle Power 3.1

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- ♦♦½ VideoGenetics

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- ♦♦♦♦ Snap Server 4100

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RATINGS

OUTSTANDING:	♦♦♦♦♦
VERY GOOD:	♦♦♦♦
GOOD:	♦♦♦
FLAWED:	♦♦
UNACCEPTABLE:	♦

PETER COHEN

The Game Room

Yo ho, yo ho, a pirate's life for me! Ever since I was a wee lad, I've been obsessed with pirate stories. This hasn't abated in my adult life—much to my therapist's fascination, I'm sure. So when I heard that Aspyr Media was publishing a Mac version of LucasArts' latest Guybrush Threepwood adventure, Escape from Monkey Island, the Blackbeard in me wildly gyrated his hook and peg leg with joy.

It's been a long time since a top-shelf adventure game made it to the Mac. Adventure games of any kind are a rare breed these days, even on PCs, but the industry-wide dearth hasn't diminished LucasArts' skill at crafting them. Escape from Monkey Island is a rollicking good time, and thanks to recent advances in graphics technology, it's a feast for the eyes as well.

Escape from Monkey Island is the fourth adventure game to star Guybrush Threepwood, a wannabe pirate and an unlikely hero if ever there was one. Although he's a bit daft, he means well. And as the story unfolds, you'll find that even though Threepwood may have a bit of Walter Mitty in him, he's not just a daydreamer—he's a doer, but in his own bumbling, incompetent sort of way. In fact, he's already won the hand of the beautiful and plucky Elaine Marley-Threepwood, resident governor of Mêlée Island—a veritable pirate haven.

Elaine and Guybrush return to Mêlée Island after a three-month honeymoon to discover that Elaine has been declared legally dead. Elaine's gubernatorial seat is up for grabs, and challenger Charles L. Charles is making his play for the position. Charles is a new—yet disturbingly familiar—presence in town. Guybrush and Elaine soon discover that proving Elaine's identity and health status is more difficult than they thought, and that their old nemesis, the dread (and undead) pirate LeChuck, is behind recent events.

Yo Ho Ho and a Venti Latte!

What makes this adventure tale so engaging is that it's firmly rooted in situations that folks can identify with today. Threepwood's arch-nemesis LeChuck may be a supernatural force straight from the flaming bowels of heck, but Guybrush needs to solve all sorts of mundane—and riotously funny—problems in his attempt to vanquish him. Threepwood and his band of brigands square off against the most fearsome menace on the high seas: lawyers. Threepwood also goes head-to-head with a real estate tycoon, a thief with no nose, a prosthetics salesman, and perhaps the most frightening of all, a bucktoothed barista at the local Starbuccaneers coffee shop. That's only the tip of the iceberg, mateys—to tell you any more of the story would ruin the surprise.

Throughout, the game is rife with well-written dialogue superbly delivered by top-notch voice actors. And an engaging soundtrack accompanies the action; contrary to my habit, I didn't scramble to turn off the music after the first few minutes.

Don't let the brightly colored, cartoonish animation fool you, by the way—kids may enjoy this title, but it's definitely made for adults (the game is recommeded for teens and adults). If the topical humor I described doesn't make that clear enough, consider that some of the puzzles in this game are tougher than a six-month-old sea biscuit.

continues

TIPS **Avast ye! If you can't find your sea legs in Escape from Monkey Island, try these tricks:**

- Typically, anything Guybrush can pick up is useful, so don't be afraid to grab whatever you find. He has amazingly voluminous pants, apparently, because that's where he keeps everything.
- Don't be afraid to talk with others. Often, conversations will get you somewhere, even if at first you feel as though you're wasting your time.
- Can't figure out what the old drunken sailor's birthday balloon is good for? Challenge the dart-throwing champ to try to hit it.
- Getting out of the bank vault involves wedging open the door frame. Hint: sponges swell when soaked.
- Once you get the directions to Pegnose Pete's lair in the Mystes O' Tyme Marshe, write them down. This will make navigation a lot easier. Otherwise you'll be traveling by raft, looking at the map to see where you are, adjusting your course, and trying again until you get there.

Simpler Than a Slipknot

Escape from Monkey Island's user interface is intuitive and straightforward. The game consists of 2-D illustrated backgrounds populated by 3-D characters and objects. The 3-D animation is excellent—objects and characters move realistically and even cast shadows.

You direct Guybrush using the arrow keys on your keyboard, and you can make him look at, use, or store various objects, as well as talk with characters. When Guybrush needs to address someone, you're presented with a branching menu containing various comments, queries, and replies, depending on the context.

The game is cleverly designed, so if you haven't yet explored a crucial area or gotten a key piece of information, your interaction with other characters in the game may subtly change so as not to give the story away. This level of detail is refreshingly complex and challenging.

Escape from Monkey Island is also nicely configurable—you can set keys to execute a variety of commands, tweak audio and video settings to your liking, and save the game at any point.

Four Sheets to the Wind

The 3-D characters and objects in Escape from Monkey Island are rendered using OpenGL, which can tax a Mac's graphics hardware. Aspyr recommends running the game on a Mac with an ATI Rage Pro or comparable graphics card and at least 64MB of RAM.

Westlake Interactive, the company that ported the game from the PC, did a nice job on the conversion. Installation was a breeze, and the game performed reliably, although it did crash once or twice on my 450MHz Power Mac G3. Interestingly, it ran perfectly on my 333MHz PowerBook G3, which is slower and equipped with less-formidable video hardware. The game's only apparent technical deficiency is a prodigious appetite for space on your hard disk. It needs 500MB in "normal" installation mode and 1GB for the full installation, and you have to keep the CD in the drive at all times.

More Fun Than an Isle o' Monkeys

If Escape from Monkey Island has any shortcomings, it's that the game often depends on self-referential jokes and on characters who were introduced in the series' first three games—which you probably haven't played, unless you have a PC lying around. If you aren't already a Monkey Island fan, you'll occasionally have that somewhat uncomfortable feeling of not being in on the joke. But that does little to diminish the otherwise excellent story.

As a single-player adventure game, Escape from Monkey Island can be played only once. But it's vast, spanning two CDs in all, and you can count on getting days—if not weeks or months—of challenging fun out of it, depending on how much time you invest. Like a long, engrossing novel, Escape from Monkey Island would be a good game to be stranded with on the proverbial desert island.

Macworld's Buying Advice

Escape from Monkey Island is an exemplary modern adventure game, superbly executed by Westlake and Aspyr. If you find the adventure genre appealing and have a bit o' the pirate in ye, then set sail for Monkey Island, by hook or by crook. **m**

If you ever hear PETER COHEN, senior editor at MacCentral, suddenly shriek "Yaar! Weigh anchor and hoist the mainsail!" while brandishing a cutlass, be very patient—he's working out a few issues.

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

ESCAPE FROM MONKEY ISLAND

Rating: 4½

Company's estimated price: $45

Pros: Engaging story; terrific graphics; many satisfyingly challenging puzzles.

Cons: Occasionally too self-referential; not for players with short attention spans.

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

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Before You Buy or Upgrade, Find Out What Really Affects Your Mac's Performance

DOES MHz MATTER?

BY JONATHAN SEFF / PHOTOGRAPH BY JAMES PORTO

Speed. Whether you need a new Mac that'll give you more of it or you want to wring as much as possible from the machine you've got, speed is what it's all about. If you've ever waited and waited for a Microsoft Excel calculation to finish or for an Adobe Photoshop filter to appear, pixel . . . by . . . pixel, you know what we're talking about.

It's easy to look at the clock speed of a Mac's processor—measured in megahertz—as the prime indicator of the computer's speed. But your hard drive, your RAM, your video card, and many other parts of your Mac also affect its speed.

That MHz number in your Mac's name *does* matter—but it's far from the only factor. To gauge how different components can optimize a system's performance, we enlisted the expertise of Macworld Lab. When you see what we found, you'll never look at *MHz* the same way again.

Quest for Speed

Your processor can be thought of as your Mac's brain, but a lot of other hardware inside your computer helps to process and transfer information. Each piece can significantly affect your system's overall speed. (See "Your Mac's Inner Life" for how everything works together.)

Your Mac can read and write data much faster to RAM than to your hard drive, so the more RAM you have, the more data your Mac can keep at the ready. Photoshop, for example, places into RAM as much information as possible about the images it's editing. When there's no more real memory available, the rest of the data is stored on the hard drive. If you've ever edited a large image in Photoshop on a system with very little RAM, you know that when the hard drive comes into play, you must sit and wait.

Though the hard drive can't move data as quickly as RAM, it still has the ability to affect performance in a major way. Regardless of its size, a faster hard drive will certainly speed up your work when memory-intensive applications such as Photoshop run out of RAM and begin storing data on the disk. And many applications—FileMaker is one example—spend most of their time reading and writing data on the hard drive.

Then there's the video card, which dramatically affects image-intensive features such as scrolling speeds, screen redraws, and the frame rates of 3-D action games.

Which of these subsystems are most vital for you to consider when you're shopping for a new system or upgrading your current one? The answer depends on how you use your Mac.

The Processor

The Mac Classic II that Apple sold ten years ago had a 16MHz processor. Today's fastest Power Mac G4s run at 733MHz. But does multiplying megahertz by 45 *really* mean 45 times the speed? When is an incremental boost in processor speed worth its price? When is a dual-processor system a prudent choice?

To analyze the power of the processor, Macworld Lab tested several models: single- and dual-processor 533MHz Power Mac G4s; a single-processor 733MHz Power Mac G4; and a 450MHz blue-and-white Power Mac G3, with and without a PowerLogix G4 upgrade card.

Basic Tasks For most basic tasks, such as starting up your Mac and using the Finder, a faster processor won't gain you anything. However, for a few basic, processor-intensive tasks, you do benefit: unstuffing a file in our trials went 7 percent faster on the 733MHz G4 than on the 533MHz G4, and encrypting a file using Apple's Encrypt command was about 12 percent faster. (See our test results in "Variations on a Mac.")

In Microsoft Office tests, the power of a faster processor was evident—the 733MHz G4 beat the 533MHz model in all five of those tests. Most impressive: the faster processor was worth a 21 percent edge in scrolling through an Excel document.

Graphics and Media When it came to Photoshop, the 733MHz Power

Variations on a Mac

We chose one Mac system as our primary guinea pig: a Power Mac G4/533 with 128MB of RAM, a 7,200-rpm Maxtor internal ATA-100 hard drive, an ATI Radeon AGP graphics card, and Mac OS 9.1 installed. We then varied components to see how each part affected the system's overall speed. We also tested a Power Mac

Best results in bold.
Shorter is better.
Longer is better.

	SPEEDMARK	MICROSOFT OFFICE 98					QUAKE III	
	Overall Score	Word Document Scroll	Word Search and Replace	Word Autosummarize	Excel Calculate Spreadsheet	Excel Document Scroll	Install	Frames per Second
Apple Power Mac G4/533	169	:20	:53	:31	:42	:14	2:45	59
with 768MB RAM	165	:20	:52	:31	:42	:14	2:45	59
with 5,400-rpm IDE drive	171	:19	:54	:31	:39	:13	2:45	59
with two 10,000-rpm Ultra 160 SCSI drives	178	:19	:51	**:30**	:38	:12	2:44	60
with ATI Radeon PCI graphics card	166	:22	:54	:31	:46	:14	2:45	54
with ATI Rage 128 Pro AGP graphics card	165	:20	:54	:31	:40	:16	2:45	40
Apple Power Mac G4/533 DP	172	:20	:54	:31	:40	:13	2:48	59
Apple Power Mac G4/733	**183**	**:16**	**:50**	**:30**	**:34**	**:11**	5:31	**67**
Apple Power Mac G3/450	128	:21	1:22	:38	:49	:19	**2:39**	33
with 450MHz G4 upgrade card	129	:20	1:21	:37	:49	:19	2:41	35
	Better ▶	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	Better ▶

Speedmark 2.1 scores are relative to those of a 350MHz iMac (1999), which is assigned a score of 100. Quake frame-rate scores are in frames per second; all other scores are in minutes:seconds. The 18 real-world tasks used in our testing, all of which use stock applications, are part of Speedmark 2.1. (In addition to our Speedmark tests, we ran a Maxon Cinema

Mac was only negligibly faster at most of the tasks than the 533MHz system (see "Putting Photoshop to the Test"). Where the processor speed really seemed to make a difference, however, was when we converted an RGB image to the CMYK color space. The 733MHz Mac did the task 30 percent faster.

In Mac OS 9, an application that is written to take advantage of both processors (such as Photoshop) can spin off tasks to the second processor. In Mac OS X, applications native to OS X can run on either processor, and tasks use the processors more equally (see "Double Vision," November 2000).

The more RAM you have installed, the more DATA your Mac can keep AT THE READY.

Audio and video applications also demand processor power—as our MP3 and video-export tests demonstrated.

Games can also be very processor-intensive. In our Quake III tests, the 733MHz system displayed 14 percent more frames per second than the 533MHz machine. The result was more-fluid game animations and a far more enjoyable gaming experience.

The Dual-Processor Difference Mac users can once again choose a computer with two processors.

In our tests, the dual-processor 533MHz model showed its best results, predictably, in Photoshop. In four of six tests, the dual-processor system beat its single-processor cousin, shaving more than 20 percent off the time needed to complete a Gaussian blur, for example.

The 3-D application Cinema 4D XL, from Maxon, also takes advantage of multiple processors. When rendering a model—a very processor-intensive task—the dual-processor Mac cut nearly half off the time of the single-processor 533MHz machine, and it cut more than a third off the 733MHz Mac's time.

In tests of software not optimized for multiple processors, however, the dual-processor Mac offered little or no advantage.

G3 versus G4 Another choice you have as a Mac user is between the G3 processor used in Apple's consumer systems (the iMac and iBook) and the G4 processor used everywhere else. The two are very similar, except for AltiVec—Apple calls it Velocity Engine—on the G4. It gives G4-savvy applications (Photoshop is one) an extra boost in speed.

We explored the differences between the G3 and G4 by pitting a 450MHz blue-and-white Power Mac G3 system against itself—with a 450MHz G4 upgrade card inside.

The two configurations were neck-and-neck in most Finder and Office tests; however, the G4 chip came through on features designed to take advantage of AltiVec. Our upgraded

continues

Macworld LAB TEST

G4/733; a dual-processor Power Mac G4/533; and a Power Mac G3/450, with and without a 450MHz G4 upgrade card. To isolate processor differences, we used the 533MHz system's hard drive, graphics card, and RAM in tests on the dual-processor G4 and the 733MHz G4 systems.

GENERAL USE						INTERNET			MULTIMEDIA		
Duplicate 100MB File	Open Multiple Folders	Encrypt 100MB File	System Startup Time	Unstuff File with StuffIt Expander 5.5	Scroll PDF File	100MB FTP Download from Server	MS Outlook Express 5 Download E-Mail	MS Internet Explorer 5 Browser Test	SoundJam 2.5.2 MP3 Encode	Render iMovie 2.0.1 File As QuickTime	Cinema 4D XL 6.3 Model Render
:09	:19	:33	:57	2:19	:35	:42	:43	:34	1:59	1:55	13:10
:08	:19	:32	1:01	2:22	:37	:48	:41	**:33**	2:00	1:50	13:13
:10	**:18**	:35	:58	2:19	:37	:40	:42	:34	2:00	1:51	13:13
:05	**:18**	:31	1:22	2:13	:35	:39	:41	:34	2:01	1:51	13:18
:08	:19	:33	:59	2:20	:37	:42	:43	:35	1:59	1:50	13:12
:08	:19	:32	:56	2:20	:39	:40	:43	**:33**	2:01	1:49	13:13
:08	:19	:32	**:54**	2:19	:36	:48	:41	**:33**	2:00	1:47	**6:45**
:09	**:18**	**:29**	:55	**2:10**	**:34**	**:38**	**:40**	**:33**	**1:21**	**1:33**	10:21
:18	:21	:48	1:10	3:03	:45	1:10	:51	:43	2:59	2:19	16:42
:18	:21	:41	1:30	2:58	:47	1:08	1:03	:42	1:55	2:22	16:05
◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better

4D XL test to gauge 3-D performance.) For more information about Speedmark, visit www.macworld.com/speedmark.—**Macworld Lab testing by Jason Cox and James Galbraith**

DOES MHz MATTER?

YOUR MAC'S **INNER LIFE**

A Lot More Goes On Inside Your Mac Than You Know. Take a Peek.

The inside of your Mac is complicated: in addition to your processor, RAM, and hard drive, there are dozens of subprocessors and controllers that ensure smooth operation. The great unsung hero of your Mac is the motherboard—the large circuit-card platter that houses, powers, and allows communications among all the components. (See "Speed Racer.")

The Processor

Most basically, computers take in data, manipulate it, and then either output the result or store it for you to work on later. The part of your Mac responsible for the most important step—the manipulation of data—is the processor, your Mac's "brain."

A processor isn't a monolithic calculation machine. Rather, it's made up of many execution units working together to run your applications. Some execution units do the actual computations that result in Microsoft Excel calculations or Adobe Photoshop blurs, for example. Others figure out which instructions to follow next and coordinate efforts among the execution units. Still others are responsible for connecting the processor to the outside world—allowing the processor to talk to the motherboard and its physical components.

All these components on a processor work in lockstep, based on the processor clock, which sets its internal rhythm. The clock is a metronome that synchronizes the workings of all the different execution units—some units may take five beats, others three, and so on. The clock's speed is described in terms of *MHz* (megahertz), or millions of cycles per second. For example, the processor clock of a 733MHz G4 processor "ticks" 733 million times a second.

Even a state-of-the-art processor such as the PowerPC G4 isn't all-powerful. It doesn't normally issue direct commands to the Mac's other components—say, telling your monitor to draw a letter on the screen. A processor usually just reads data sitting in your Mac's RAM, manipulates that data (based on the instructions given by your software),

and writes the results back into RAM. Endless variations of these steps, coupled with the movement of finished work from RAM to the hard drive or the monitor, result in the productive Mac you know and love.

The Motherboard

The motherboard provides physical connections and power for all of the components on it, which are numerous: RAM, processors, ROM chips, modems, AirPort cards, power controllers, PCI and AGP card slots, ATA and EIDE connectors for peripherals such as hard disks and CD/DVD drives, and external connectors for audio, USB, FireWire, and Ethernet.

But the motherboard is more than a power socket and hardware organizer. As the conduit for communication between your Mac's many systems, it allows the processor to send its commands to the other components, and it lets those components communicate with the processor and each other. Your processor tells the EIDE controller on the motherboard what data to burn in your CD-RW, for example, and that controller manages the CD-RW's burning process.

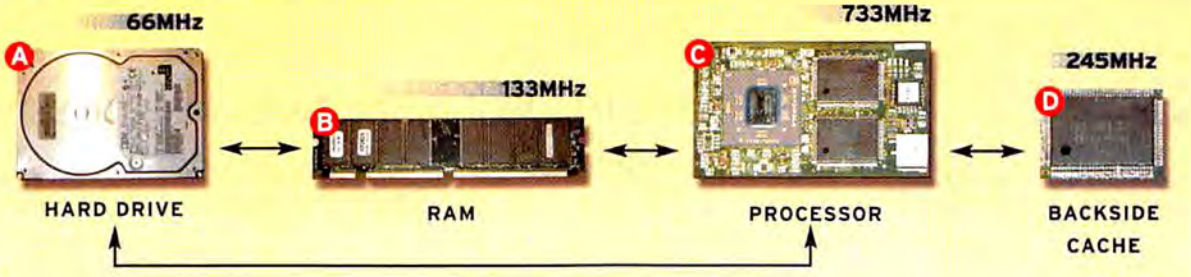
Lines of Communication

Of all the tasks your Mac's motherboard must perform, perhaps the most difficult is allowing all your Mac's parts—which run at different speeds—to communicate with one another. The lines of communication are called *buses*, and each has its own clock speed (measured in MHz) and *width* (how many bits of data it can transmit in one tick of the clock).

Every computer motherboard has *bridges* that act as go-betweens for the many different buses. Most of the Mac's peripheral systems—USB, FireWire, and IDE, to name a few—are connected to the PCI bus, which runs much more slowly than the system bus (the processor and the memory). Data from the Mac's slower components (such as the hard drive) travels across the PCI bus and from there via bridge to RAM.

Thanks to the bridges, the processor is more efficient—it rarely has to waste

Speed Racer



To open a file—a Photoshop image, for example—your processor C tells your hard drive A to send those bits of data into RAM B. To apply a blur filter, a pixel-by-pixel operation that repeats the same instruction set over and over, the processor grabs the image from RAM and then stores the reusable code in the much faster backside cache D. After going back and forth between the speedy processor and backside cache, the processed data is dumped back into RAM and sent to the hard drive.

ticks of the clock waiting on a slow component. The processor can fire commands off to a bridge and then move along to another task. For example, the processor can send a block of data to the video card, and the video card can collect the data later, when it is ready, all because the bridge is acting as the conduit. Many of the components on the motherboard have their own RAM for collecting data before it is sent to or received from the processor in one efficient burst.

An efficiently running Mac is one in which the processor is working on something **ALL THE TIME.**

Caches

In an efficiently running Mac, the processor is working on something all the time. If the processor has to wait idly for data to arrive from RAM, that inefficiency will translate to a slowdown. The only way to ensure that the processor is always busy is to have all the RAM run at the same speed as the processor. Unfortunately, equipping all Macs with such speedy RAM would be much too expensive—and that's where cache RAM comes in.

The 733MHz Power Mac G4 processor operates five-and-a-half times faster than the Mac's 133MHz RAM, yet the machine is incredibly efficient. This is accomplished with a *backside cache*.

The frontside bus is the channel between the processor and the main memory, but that bus is slow. So, engineers created a special backside bus that runs only between the processor and the cache, a small amount of memory manufactured to run many times faster than normal RAM.

Backside caches improve performance in a very elegant way. Your Mac's processor receives repeated commands and data about 90 percent of the time. Storing that information in an ultrafast cache reduces the number of times your Mac must read from the far slower RAM on the motherboard.

Sooner or later, the processor will need something from main memory that isn't in the cache—called a *cache miss*. When this happens, the processor retrieves what it needs from the RAM on the motherboard.

The latest Power Mac G4s have three layers, or levels, of backside cache. The first layer, called level one (or L1) cache, is built into the processor itself. It contains 32K worth of cached instructions for the processor, and 32K of data that the processor will use to execute those instructions. The L1 cache, which runs at the same speed as the processor, contains the stuff your processor will work on during the next few nanoseconds.

Since the introduction of the G3, PowerPC Macs have also had an L2 cache, which tends to run a bit slower than the processor, but because it's connected directly to the processor, it still runs much faster than system RAM. On current G4 Macs, the L2 cache has been integrated into the processor itself. However, these Macs have been bolstered with even more cache—an L3 cache that runs at one third of the processor's speed. That may sound a bit poky, but using the L3 cache is more efficient than retrieving information from RAM on the motherboard.

Working Together

All of your Mac's subsystems work together to help the processor run more efficiently, with the motherboard serving as the great negotiator and communicator among them all. Yes, the processor is a critical component, but it's only one element of your Mac's complex inner life.—DAVID READ

G4 system performed a Gaussian blur in Photoshop in half the time it took the original system, and it also rendered lighting effects faster. In MP3 encoding, the upgraded system shaved 36 percent off the G3's time.

The Bottom Line Just look at the difference between similarly configured Power Mac G4s, one running at 533MHz, the other at 733MHz: the latter model has a clock speed nearly 40 percent faster (and at press time, it cost roughly $500 more). Yet in most of our tests, it provided a less-than 10-percent improvement, and in only a handful did it make a difference of 20 percent or more.

Faster or multiple processors generally mean faster computers, but the difference won't matter much unless you spend most of your time in a 3-D, graphics, or video-editing application. Even then, RAM might give you more bang for your buck. If you do a lot of work with graphics, the horsepower of a faster processor will help, but an *extra* processor will help even more—if the applications you use are multiprocessor-aware, and especially if you're using Mac OS X.

WHAT MATTERS WHEN?

Mac Tasks	Critical Components
General use	RAM
Microsoft Office	RAM
Adobe Photoshop	RAM, dual processors
Digital video	Processor, hard drive, RAM
Digital audio	RAM, hard drive
3-D	Processor, RAM
Games	Video card, RAM

RAM

The more RAM you have, the more information you can store there. That means fewer trips to your relatively slow hard drive. And although RAM prices fluctuate, lately they've been as low as prices on the stock market. So when does adding RAM make sense? To find out, we retested our 533MHz G4 after increasing its puny 128MB of RAM to a total of 768MB.

Basic Tasks In most general-use areas, adding RAM to our test systems made little difference. However, it's important to note that the more RAM you have, the more applications you can run simultaneously. That's not technically a speed gain, but being able to switch between open applications instead of having to quit some before launching others certainly helps productivity.

Mac OS also offers built-in virtual memory; turning it on sets aside part of your hard drive to be used as memory when your RAM fills up. But hard drives are slower than RAM. If you rely on virtual memory to keep all your favorite applications open, adding RAM instead will dramatically improve your system's responsiveness.

Graphics and Media In Photoshop work, you manipulate a lot of information. Every time you run a filter, that filter must analyze and modify every last pixel of your image. The more image information you can keep in RAM, the faster Photoshop runs.

So when we added 640MB of RAM to our test system, Photoshop began to fly. Rotating and applying lighting effects to an image went twice as fast as they did on the original 128MB system. The extra RAM tripled the system's scores in the Gaussian Blur and Unsharp Mask tests. And resizing an image was four times as fast with the added RAM.

Outside of Photoshop, additional RAM didn't make much difference in test results. The system's performance in our iMovie test was slightly better with the additional memory, but scores in our Cinema 4D XL, SoundJam, and Quake tests were essentially unchanged.

For a Photoshop professional, massive amounts of RAM and two G4 processors are a **POTENT DUO.**

Dual Processors We also added RAM to our dual-processor 533MHz and single-processor 733MHz Power Mac G4s, and we tested them with Photoshop. The result was an impressive display of Apple's dual-processor technology: the dual-processor system was clearly faster than the 733MHz system in four of our six tests.

Massive amounts of RAM and two G4 processors are the most potent combination any Photoshop professional could want.

The Bottom Line If you're a Photoshop pro, RAM is where it's at. We saw tremendous gains when we added memory, especially on the dual-processor G4. If Photoshop is not your main application, more RAM won't bring huge speed gains, but it can help if you run many applications simultaneously or rely on virtual memory.

The Hard Drive

Writing to or from a hard drive has traditionally been a performance bottleneck for Macs. Processors had to wait around for slow hard drives to provide them with data. The surefire way to speed up a Mac II was to buy a speedy new hard drive.

We tested three hard drive configurations in our 533MHz G4: its built-in 7,200-rpm Maxtor ATA-100 drive; a slower 5,400-rpm Western Digital ATA-66 drive; and a RAID array with two 36GB Seagate 10,000-rpm drives connected via Adaptec's 39160 Ultra 160 SCSI card.

Basic Tasks The 5,400-rpm drive and 7,200-rpm drive were evenly

Putting Photoshop to the Test

Few applications expose a Mac's deficiencies better than Adobe Photoshop. We ran a series of Photoshop tests on each of our various Mac configurations. Since RAM is a major factor in Photoshop performance, we tested each system twice—once with 128MB of RAM and a second time with 768MB.

Best results in bold.
Shorter is better.

		ADOBE PHOTOSHOP 6.0.1					
	RAM	Gaussian Blur	Unsharp Mask	Resize	RGB to CMYK	Rotate Canvas	Render Lighting effects
Apple Power Mac G4/533	128MB	:16	:15	:08	:23	:18	:13
	768MB	:05	:05	:02	:20	:09	:06
with 5,400-rpm IDE drive	128MB	:27	:23	:18	:24	:28	:15
	768MB	:05	:05	:02	:20	:09	:06
with two 10,000-rpm Ultra 160 SCSI drives in striped RAID array	128MB	:13	:12	:05	:23	:15	:11
	768MB	:05	:05	:02	:20	:08	:06
with ATI Radeon PCI graphics card	128MB	:15	:15	:08	:23	:19	:15
	768MB	:05	:05	:02	:20	:08	:06
with ATI Rage 128 Pro AGP graphics card	128MB	:14	:13	:08	:23	:13	:15
	768MB	:05	:05	:02	:21	:08	:06
Apple Power Mac G4/533 DP	128MB	:12	:12	:08	:23	:16	:12
	768MB	**:03**	**:03**	**:01**	:20	**:05**	**:04**
Apple Power Mac G4/733	128MB	:15	:14	:08	:16	:17	1:03
	768MB	:05	:05	:01	**:12**	:07	:06
Apple Power Mac G3/450 with 128 RAM		1:02	:32	:18	:36	:36	:38
with 450MHz G4 upgrade card		:31	:31	:17	:37	:36	:29
		Better	Better	Better	Better	Better	Better

All scores are in minutes:seconds. We used a 50MB file and tested each system with a default system disk cache, virtual memory disabled, and displays set to 24-bit color and 1,024-by-768-pixel resolution. We set Photoshop History to Minimum. In tests with 768MB RAM, we set Photoshop's memory partition to 250MB; with 128MB of RAM, we set it to 75MB.—**Macworld Lab testing by Jason Cox and James Galbraith**

matched in most of our Finder tests, but the RAID array was clearly faster than either. With this configuration, our system duplicated a 100MB test file in just over half the time it took the other drives.

Graphics and Media Photoshop likes lots of RAM, but once it runs out, it has to write data to the disk—and the faster the hard drive, the better. The RAID array had the fastest times, beating our 7,200-rpm drive on nearly every front. Resizing an image went nearly 40 percent faster on the RAID system. The 5,400-rpm drive was dead last in all our tests.

The Bottom Line For most common tasks, the speed of your hard drive won't make much difference. As our testing showed, a hard drive's effect is most apparent in disk-intensive programs such as Photoshop.

The advantage of a faster drive applies most to capturing and editing digital video and audio—tasks that involve gigantic amounts of data. For example, if you're a musician, you'll want a speedy drive so you can simultaneously play back multiple audio tracks.

But the cost of our high-end RAID system ($480 for a SCSI card plus $1,100 for two 10,000-rpm drives) makes it a serious investment for a graphics professional. Before you buy such a drive, consider adding a lot of RAM and a faster processor instead.

The Video Card

A Mac's video card draws everything you see on its monitor. Today's video cards are blazing fast, and most are designed to draw complicated graphics, such as the 3-D graphics in cutting-edge games, as fast as possible. To see how different video cards affected performance, we tested the G4/533 with its installed ATI Radeon AGP card and with an ATI Rage 128 Pro AGP. (We also tried it with a Radeon PCI card.)

Basic Tasks Most of these results weren't affected by the change in video cards. But for scrolling—which relies heavily on the power of your video card—the faster Radeon card clearly outperformed the Rage 128 Pro. The Radeon was 10 percent faster at scrolling a PDF file and 12 percent faster at scrolling in Excel.

Graphics and Media The Radeon has more RAM and is newer than the Rage 128 Pro, and that hit home in our gaming tests. In our Quake test, the Rage 128 Pro drew about 40 frames per second, compared with Radeon's 59 frames, which made for noticeably smoother game play.

The Bottom Line A better graphics card will speed up scrolling and support monitors with higher resolutions. If you are a graphics profes-

continues

sional, improved scrolling speeds will save you some time. But the best reason to upgrade your video card is to play games on your Mac.

Other Factors

Several other things also affect performance. You can't upgrade your system bus, and most people won't upgrade their DVD- or CD-ROM drives, but each of these has bearing on a Mac's speed.

System Bus A *bus* is a line of communication between your Mac's components. The system bus connects the processor to the RAM. Essentially, the faster your Mac's system bus, the faster your Mac's processor can work.

The latest Power Mac G4s feature a system bus that runs at 133MHz. The system bus on the PowerBook G4, G4 Cube, and iMac runs at 100MHz. iBooks have a slower 66MHz system bus.

Optical Drives A major quirk our tests revealed was that the 733MHz G4 took twice as long as our 533-MHz G4 to install Quake from a CD. That's because the 733MHz model we tested uses Apple's new DVD-writing SuperDrive, which reads CD-ROMs much more slowly than the CD-R drive in the 533MHz G4.

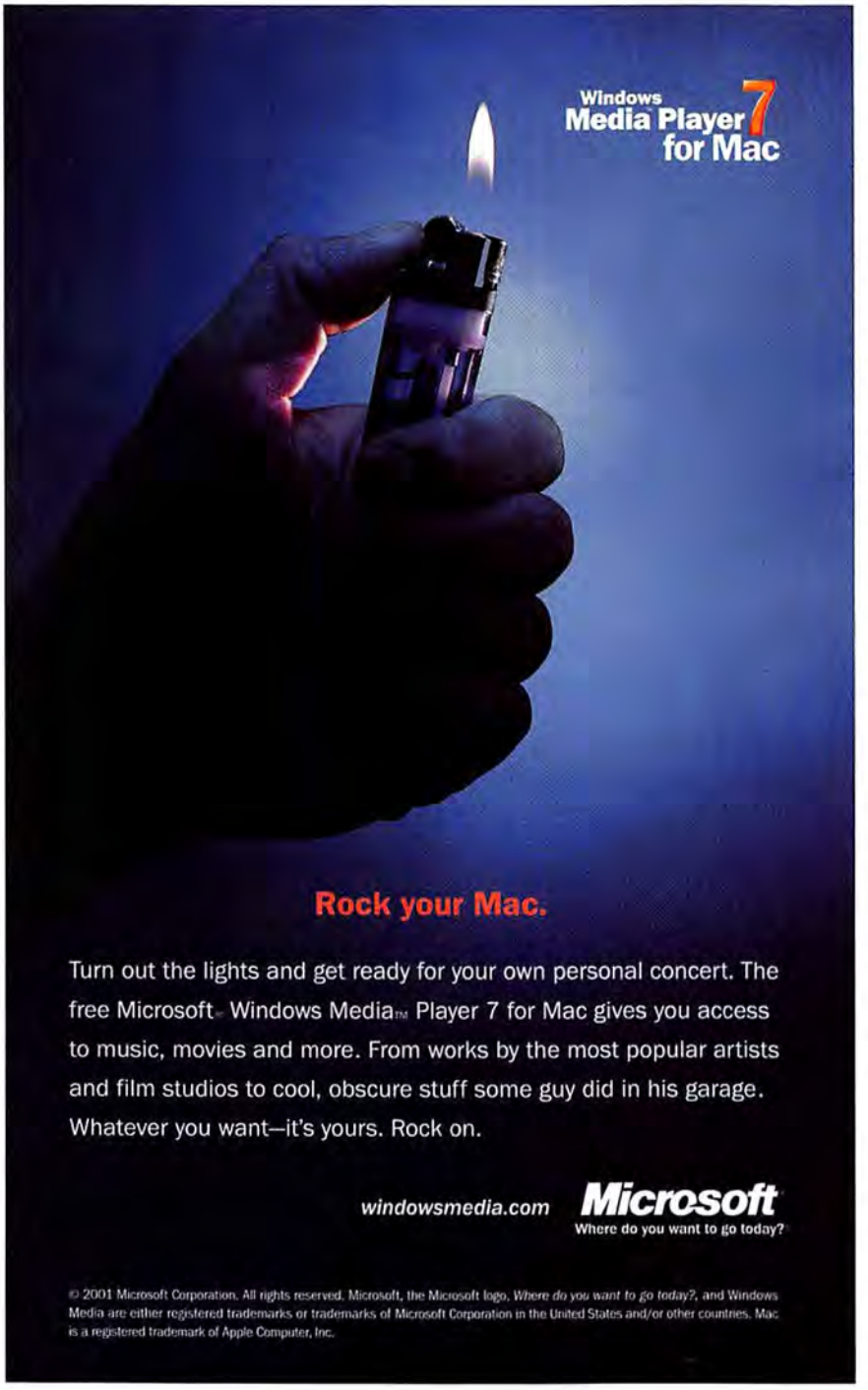
The Last Word

Processor speeds measured in hundreds of megahertz are flashy, easy-to-compare numbers, but they don't tell the whole story. Your Mac's other components also have a lot to do with how fast it runs.

How you use your Mac on an everyday basis will determine which components mean the most to you (see "What Matters When?"). If you need to move large chunks of data—Photoshop pros, take note—loading up on RAM will generally do you more good than superfast hard drives and hyperclocked processors. Faster processors generally make for faster Macs, but they aren't good investments unless you spend a lot of time with processor-intensive 2-D, 3-D, or video applications. And if you're a gamer, spend some cash on a better video card and watch frame rates skyrocket along with your scores.

Whether you're shopping for a new Mac or just trying to squeeze more life out of your current system, look beyond megahertz: it will help you make a much wiser hardware investment. **m**

Associate Editor JONATHAN SEFF specializes in Mac systems and multimedia.



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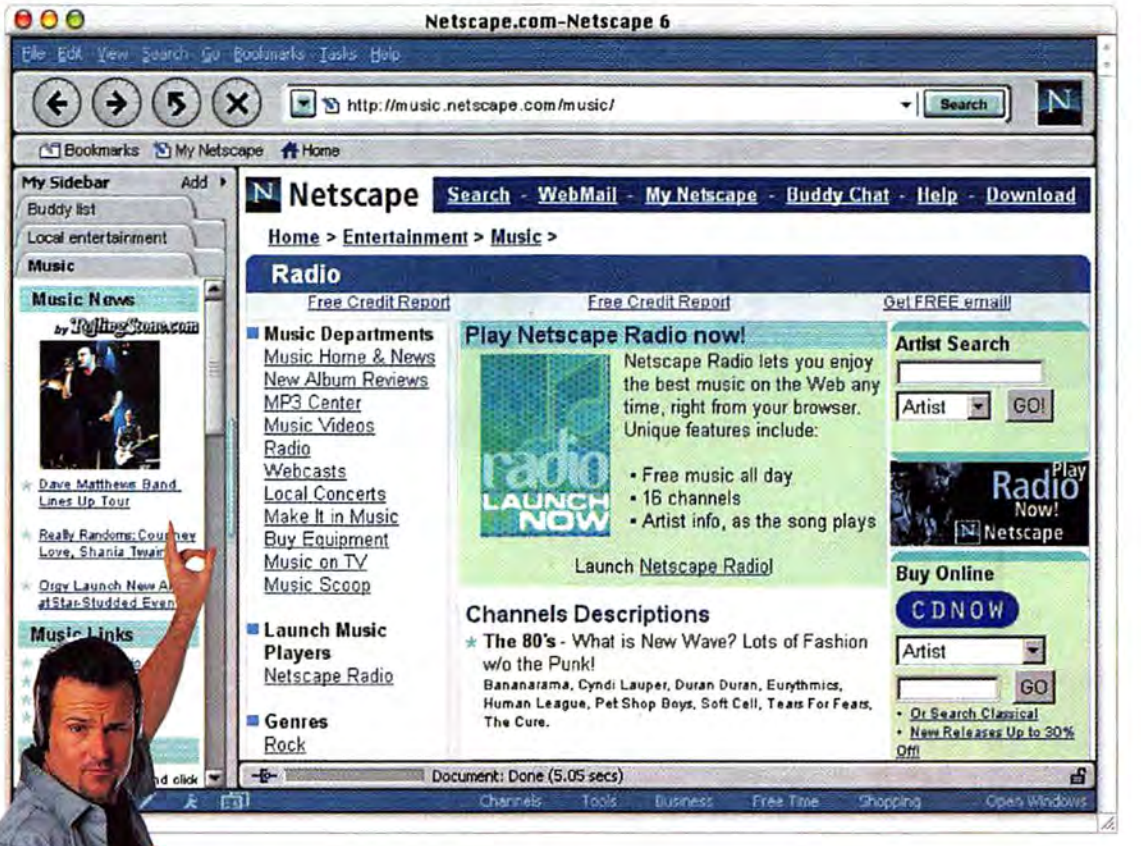

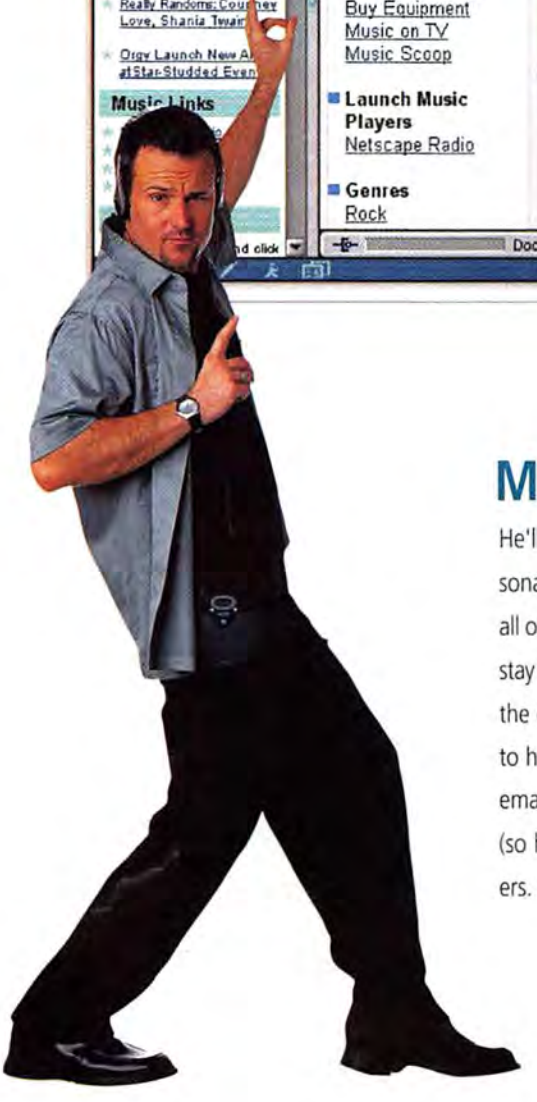

Michael Cunningham is a software developer and a real music lover.

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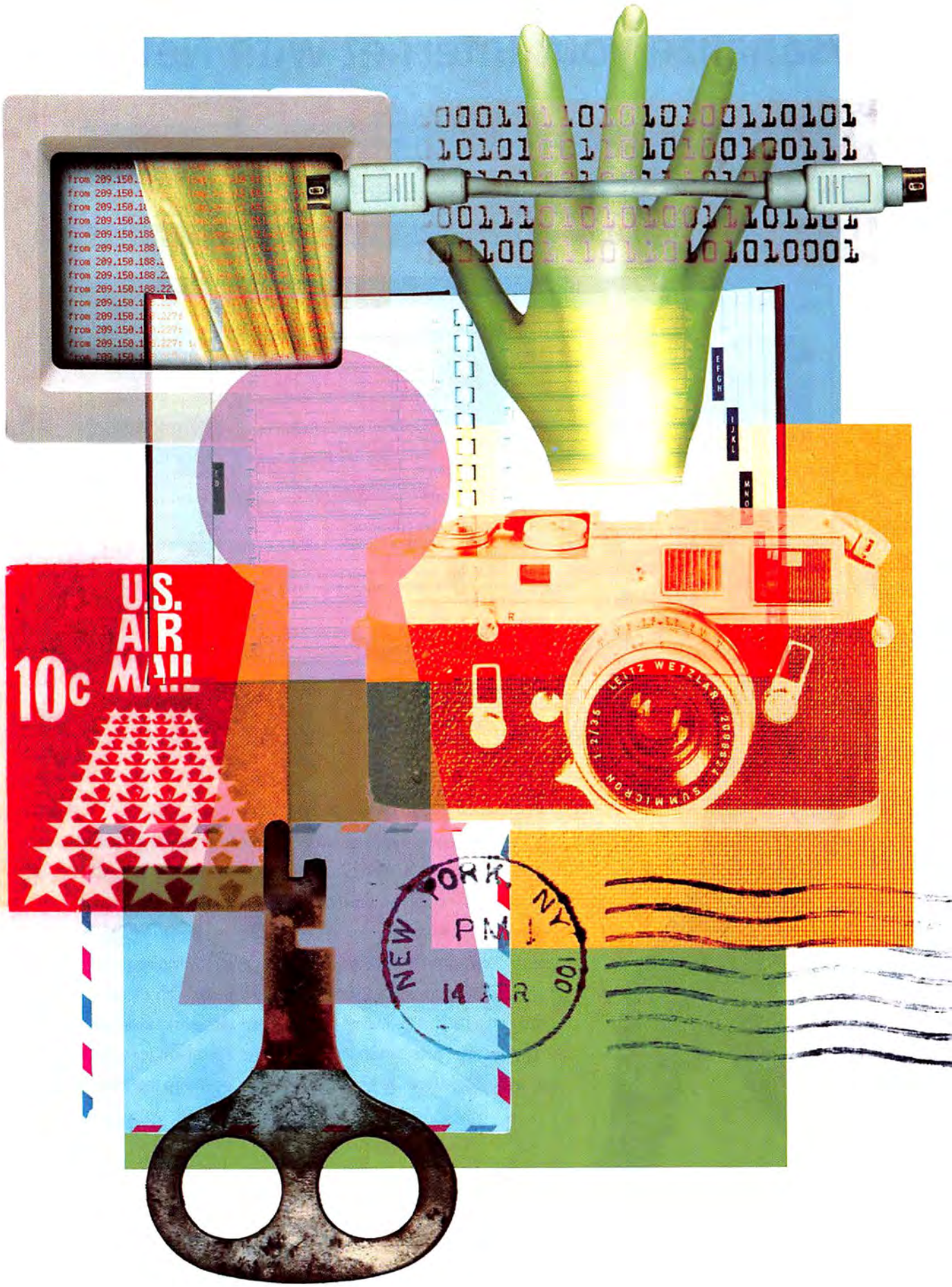
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INSIDE THE OS X EXTRAS

GET THE SCOOP ON 5 USEFUL APPLICATIONS THAT COME WITH THE NEW OPERATING SYSTEM

ILLUSTRATION BY MARGARET RIEGEL

Apple has provided not only a completely new operating system but also a collection of new applications and utilities to show it off. Like the MacPaint and MacWrite programs on the earliest Macs, the new Mac OS X applications exist as much to demonstrate the promise (and polish) of OS X as to do their primary jobs.

Take the Clock application. Despite its location in the Utilities folder, its actual utility is debatable. After all, if you want to know what time it is, you need only glance at the right side of the menu bar. But when you adjust the transparency of Clock's analog display so that it floats faintly over a document window without obscuring your work, the elegance of OS X's Aqua interface is undeniably apparent. A similar claim can be made about the updated Stickies application. No, the world hasn't been clamoring for a better, prettier Stickies app, but this one sure *looks* cool.

Given the resources Apple surely invested just to get the first version of OS X out the door, it's a little surprising that apps as nonutilitarian as Clock or as inessential as the Chess program were included at all. But most of Apple's OS X applications serve more practical needs. Console, Process Viewer, Terminal, and NetInfo Manager, for instance, help Unix and network geeks get their work done. Internet Connect, Grab, QuickTime Player, Image Capture, Calculator, and TextEdit take care of basic functions—often far more elegantly than their predecessors. And showing its commitment to open-source standards, Apple includes Applet Launcher (for Java applets), too.

Here's a look at the most-important applications that come with OS X. And to help you get some OS X dirt under your nails while you wait for Carbon apps to appear later this year, we've also included some tips on using them.

ADDRESS BOOK

For Apple to call Address Book an application is somewhat misleading. This is not what used to be called, in pre-handheld days, a "personal information manager," or PIM. Address Book is not what you'll use to address your holiday newsletter or to keep track of birthdays. Rather, Address Book is like a part of Apple's Mail application (see "Review: Mail," elsewhere in this feature) that has been split off into its own app—kind of like *Joanie Loves Chachi* was spun off from *Happy Days*.

Every e-mail program has some kind of address book where you can keep a list of e-mail addresses that you frequently use. Address Book provides that functionality in stand-alone form. Its primary purpose at present is to provide address-book functionality to Mail, but there's no reason it couldn't work with other e-mail programs or interact directly with your handheld in the future. Address Book supports the vCard specification for personal information—a standard endorsed by everyone from Microsoft to Palm. Address Book lets you save individual addresses as vCards, essentially electronic business cards. They can be sent (by e-mail or IR beam) as files and then imported into applications such as Address Book by dragging and dropping.

Putting It in Contacts When you open Address Book, a window lists

all of your contacts. This view lets you see only each contact's name, phone number, and e-mail address. To view more information, you must open a contact's record.

There are two easy ways to add contacts. One is to import them from a tab-delimited list. If you keep e-mail addresses in a PIM such as Palm Desktop, it's easy to save your contacts in a text file and then use Address Book's File: Import command. If you want to import addresses from a different e-mail program's address book, things might get trickier. Check out the eMailman Web site (http://emailman.com/conversion/#addrmac) for tips on importing address books from various programs.

The other approach is to use Address Book's Add Sender command (⌘-Y) to quickly add a bunch of e-mail addresses. Say you have a folder of saved messages from your friends. Select them, and redirect them to yourself from within your e-mail program. (Don't forward them or they'll be sent to you from yourself.) Send these messages; then quit your e-mail program before it has a chance to check your mailbox. Log on to OS X's Mail program to receive the messages that you just redirected to yourself. Select them, and press ⌘-Y.

Address Book has a few other cool tricks, as well. To put a vCard from Address Book onto your desktop, click on the address's head icon and drag the vCard to where you want it (see "Desktop Business Cards"). If you receive a vCard that you'd like to add to Address Book, double-click on the vCard, and it will open in the Address Book application—with a button that allows you to add it.

Every vCard has a field for a picture. It's simple to add a photo to this field: you just drag and drop a JPEG, GIF, TIFF, PNG, or PDF file. Apple says you'll get the best results using a file that's 64 by 64 pixels, but you can get acceptable results with photos nowhere near that size or proportion, as the following example illustrates.

1. First, create a new contact record in Address Book.
2. In the Name fields, enter **Andy Ihnatko** (*Macworld* columnist and beloved industry figure).
3. Enter Andy's e-mail address: **andyi@world.std.com**. This step is essential, because without an e-mail address, a record cannot contain a picture.
4. Using Microsoft Internet Explorer, visit www.andyi.com.
5. Scroll down to the "unnaturally flattering" photo of Andy; click and hold the mouse on it to download it. Save it to the desktop for easy access.
6. Quit Internet Explorer.
7. Drag the photo from the desktop to the Picture field on the address record you just created. Once Andy's face appears in the field, you can click on Save. Andy Ihnatko's name, e-mail address, and photo should now appear in your Address Book.

Adding a photo to a record has one immediate benefit: every time you

continues

Desktop Business Cards Want to put a vCard on your desktop? Simply grab the head icon next to the contact's name (top) and drag it to the desired spot (bottom).

Consuelo Lopez.vcf

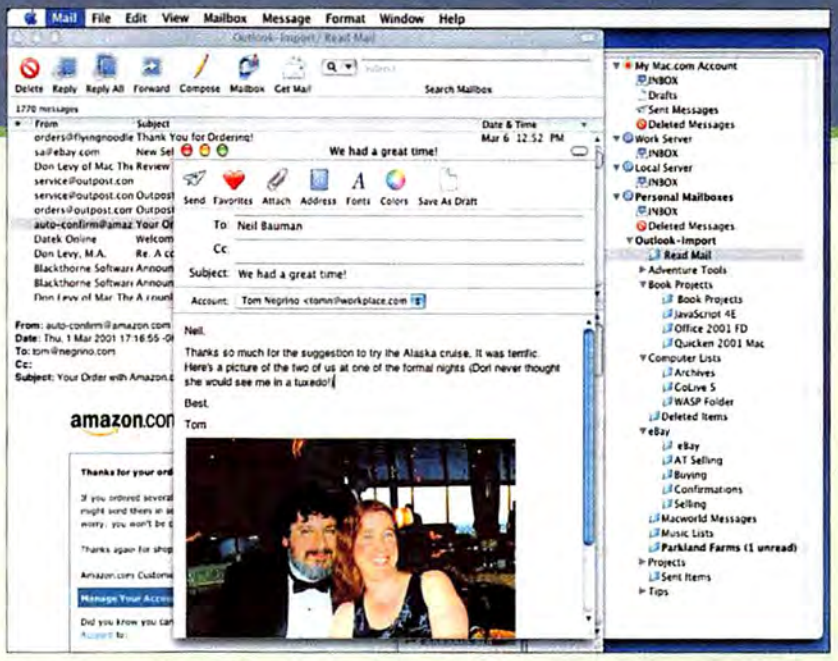
REVIEW: MAIL

Mac OS X's E-mail Program Lacks Polish, Harbors Bugs

Mac OS X's commitment to the Internet is one of its most appealing features, from the Apache Web server under the hood to the inclusion of iDisks in the Finder. Most people use the Internet primarily to send e-mail, so Apple's Mail 1.0, included with OS X, is welcome, especially as one of the few native Mac OS X (or Cocoa) applications available in these early days. Unfortunately, the first version of Mail has many drawbacks and outright bugs, making it unsuitable for heavy use.

The program includes most of the features you would expect in a modern mail application. It supports multiple e-mail accounts, of which any can be POP, IMAP, or Unix. You'll also find a Rules feature, for filtering mail based on criteria you select; support for multiple signatures; and the ability to create and view messages with images and Rich Text formatting. Converting from other mail programs is easy; Apple has made a set of unsupported AppleScripts, available on its Web site, that let you import messages from Microsoft Entourage and Outlook Express, Qualcomm Eudora, Netscape Communicator, and Claris Emailer.

As part of the initial registration of Mac OS X, you're asked to enter or create an iTools account, which includes a mac.com e-mail address. (You can also choose to add other mail accounts during setup.) The installer conveniently sets up your mac.com account in Mail as part of this process, so you're ready to send and receive e-mail as soon as you're up and running with Mac OS X. If you skipped entering your iTools information during installation, Mail can still set up your mac.com account for you. Just open System Preferences, click on the iTools tab, and enter your iTools user name and password; then click on the Email tab and select the Use iTools Email Account option.



Pretty on the Outside Mail, which is free with OS X, looks great, thanks to the Aqua interface; however, it needs more depth and better stability.

Making and Reading Mail

Mail lets you compose e-mail messages in one of two formats: plain text and Rich Text. The first is text with no fancy formatting. Rich Text adds formatting tags to text, allowing you to add fonts, font styles, and inline images. Rich Text is similar to HTML; however, Mail cannot create e-mail in HTML format. Rich Text conforms to the Internet mail format for enriched text and can be read (with varying degrees of accuracy) by programs such as Eudora and Outlook Express. Some older e-mail programs can't handle Rich Text; those programs will show the formatting tags in the message body and turn embedded images into attachments. Mail's Rich Text is not the same as Rich Text Format (RTF), a document interchange format created by Microsoft (and also the native format of OS X's TextEdit).

Using Mail to compose messages is easy and enjoyable. Mail uses Apple's Address Book application for addressing; addresses automatically complete as you type them, or you can drag and drop addresses from Address Book into your new message form. One annoying drawback is that if a contact has more than one e-mail address listed in Address Book, Mail can access only the first address. You can work around this by making another address record for each e-mail address, but there's no way to define an e-mail address as the primary one for a person. Spelling mistakes are underlined as you type, and you can fix errors simply by clicking on a contextual menu item. And of course, as a Cocoa program, Mail takes full advantage of OS X's gorgeous text styling and rendering, with the full palette of antialiased fonts, styles, and text colors available.

Mail displays incoming e-mail that was created in plain text, Rich Text, or HTML formats. Unfortunately, the HTML mail display is buggy; sometimes inline images fail to display when you first view the e-mail message. If you switch to another message, then back to the first one, the images load properly.

Deficient in the Details

Good filtering is an essential feature for e-mail programs (especially to help keep the flood of spam out of your in-box), but here Mail falls short. The range of filtering criteria is too small, and you can filter only by one criterion per rule. Mail also lacks some useful features you can get in other programs, such as Outlook Express's Junk Mail Filter, or Eudora's text-formatting plug-ins.

You'll quickly run into some of Mail's limitations. For example, you can search only one mailbox at a time, and you can't redirect incoming mail. Overall performance wasn't especially snappy on a 400MHz Power Mac G4 with 256MB of RAM; like much of OS X, Mail just feels slow, especially when opening mailboxes with many messages or resizing windows. If you need assistance, you probably won't find it in Mail's abysmal help files. Far from comprising a good tutorial or reference, they supply only the smallest amount of information, and they fail to explain many of Mail's features altogether.

Given the importance of e-mail, you would expect Mail to be practically bulletproof, or at least immune to simple crashes. Unfortunately, this is not the case. The program unexpectedly quit many times during my testing, and I discovered a reliable way to crash it: simply double-clicking on a particular spot in the mailbox list.

Macworld's Buying Advice

That it's free is one argument in favor of using Mail, but when you consider Mail's problems, this argument may not prove strong enough. You can readily get free versions of other, better mail programs, and no one likes a program that crashes. Until Apple fixes Mail's bugs and addresses at least some of its shortcomings, you're better off sticking with Qualcomm Eudora or Microsoft Outlook Express.—TOM NEGRINO

MAIL

Rating: ❦❦

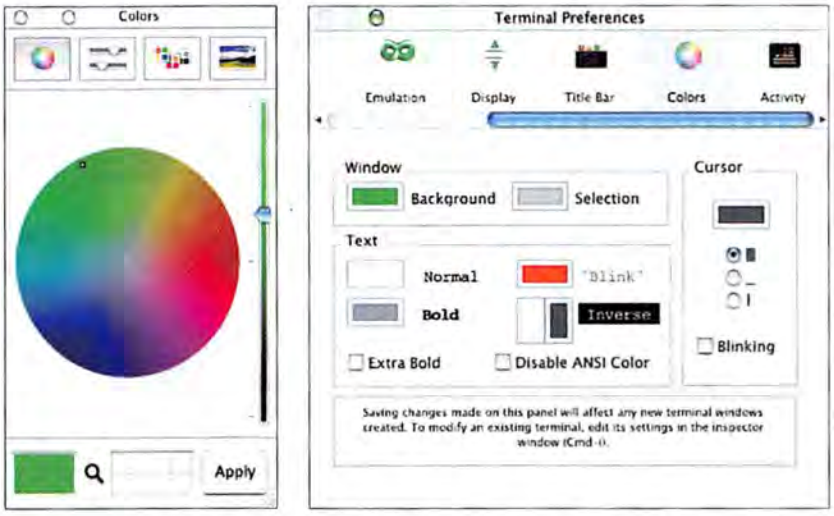
Pros: Nicely integrated with iTools; flexible mail composition; many formatting options.

Cons: Buggy; limited by Address Book; weak mail filtering; inadequate help files.

Company's Estimated Price: Free with Mac OS X

Company: Apple Computer, *408/996-1010*, **www.apple.com**

get a message in OS X's Mail application from that e-mail address, the person's photo will appear in the upper right corner of the Address Book window. Of course, to test our example you'd have to get an e-mail from Andy Ihnatko; fortunately, he's a prolific correspondent.—JAMES BRADBURY



Terminally Beautiful Get in touch with your inner geek—change Terminal's look by using green Monaco text on a black background (think Apple II).

TERMINAL

Before 1984, most computers used what was essentially a "terminal" interface. You may remember it well: the blinking orange cursor waiting for you to type something such as C:// on a black screen. The Mac changed all that, as the first personal computer to have a GUI (graphical user interface). So it may seem odd that Mac OS X includes Terminal, an application that lets you access the Unix command line underneath the interface.

Why would Apple catapult us back to the early eighties? Well, even though you'll be just fine if you never venture beyond OS X's Aquified programs, you can do much more with OS X by taking control of the command line. You can use OS X's built-in suite of Unix commands to perform a wide range of tasks, from finding hidden files to deleting files you're unable to put in the Trash Can. (See "Take Command of Mac OS X," *How-to*, elsewhere in this issue for help with using the command line.)

But you don't have to limit yourself to the commands under OS X's hood. The Internet abounds with Unix applications that you can compile and run from the command line. For instance, you can use pine (a popular text-based e-mail client) and mmap (an application that scans IP addresses for open ports, helping you find security holes in your network). You can also use the command line to create *shell* scripts (similar to AppleScripts) that enable your Mac to perform tasks such as copying a set of files to a removable disk and then compressing them. Using a script with the Unix **cron** command—which lets you schedule system functions such as copying or synchronizing files—you can even have your Mac run scripts in your absence.

Hey, Good Looking Before you dive into using the command line, you may want to try customizing Terminal's appearance. For example, you can change the size of the Terminal window if you want to see more or longer lines of text than are visible in the default setting, 80 by 24 characters. Simply go to Terminal's Preferences dialog box and click on General to get to the window-size options. Keep in mind, however, that if you access a computer remotely, Terminal will use the standard 80-by-24-characters setting on the remote display. The result could look rather odd.

You can also go for a whole new look by customizing the font and background colors of the Terminal window. You do this from within the Colors and General panels in the Preferences dialog box (see "Terminally Beautiful").

Perhaps a more useful trick is making the Terminal window semitransparent, so you can see other applications while you're using Terminal. To adjust transparency, type **defaults write com.apple .Terminal TerminalOpaqueness .4** in the command line: **.4** is the level of transparency; the higher the number, the more opaque Terminal's window. One limitation is that all you'll be able to see through it are your Carbon and Cocoa applications.—BRETT LARSON

GRAB

Grab is a simple program that performs an essential task: capturing screen images as TIFF files. Apple no doubt had to create Grab so that the developers working on OS X applications could illustrate on-screen help and instructions. The program is useful for the rest of us, too, since it offers an easy way to quickly grab low-resolution images off the screen. And Grab has a couple of nifty features that far outstrip the old keystroke combinations of early

Mac OS iterations: for instance, you can choose the cursor you'd like to appear in your screenshot, take timed shots, or choose a portion rather than the entire screen.

Grab is also one of the applications that appears as a service in other applications. To see how this works, open the TextEdit application from the Applications folder. Type in some text, and then choose Services: Grab: Selection from the TextEdit menu. After you select a portion of the screen as directed, Grab inserts it into your text window.—JAMES BRADBURY

NETINFO MANAGER

NetInfo Manager is a powerful administration tool, but it's not for the average user. If you're a system administrator, or if you've had experience managing Unix computers that used the NetInfo Database or Mac OS X Server, you're a prime candidate for putting this application to work.

You use NetInfo Manager primarily to perform Unix administration tasks. You can use NetInfo Manager to mount NFS directories, for instance (Network File System is a Unix file-sharing standard for localnetworks). Since OS X stores user and password information in the NetInfo database, you can also use NetInfo Manager (instead of System Preferences) to make changes to user accounts. If the database is shared on a network, you can administer user accounts on multiple Macs and Unix machines.

Are You Ready for Your Mystery App? There's nothing Mac-like about the NetInfo database, and the NetInfo Manager utility is only remotely Mac-like. Making changes in this application—such as selecting an item and pressing the delete key—can cause damage and even make OS X unusable on your Mac. Be sure you know how to use this program before opening it.

It's not easy to obtain help in using NetInfo Manager. Don't even bother looking to the Help menu, which will tell you only, "Help isn't available for NetInfo Manager." Fortunately, you *can* access information from the Unix command line. Open Terminal (Applications: Utilities), and type the command **man netinfo** in the Terminal window. This will bring up a Unix manual (circa 1990) that defines the various aspects and parameters of the NetInfo database. In order to scroll through the manual, just press the return key. When the percentage displayed at the bottom of the Terminal window reaches 100, you have reached the end of the document.

Getting into NetInfo Manager Except for its Aqua interface, this NetInfo Manager is the same as the Mac OS X Server version. The top half of its main window consists of a Directory Browser that looks like the Finder's column view. However, NetInfo *directories* are not folders in the file system but subgroups of the database. When you click on a NetInfo directory, the bottom portion of the NetInfo Manager window will display Property fields and a corresponding value. You can edit the field names and values or create new directories. To edit them, click on Users and then on a user name. This will let you see and edit the user's name, short name, password, password hint, and other attributes.

Power Troubleshooting If you need maximum control over a system so you can do low-level Unix troubleshooting, log in to NetInfo Manager as the root user. This will give you access to every folder in OS X—even the invisible ones. (Unless you're sure of what you're doing, though, skip this trick; it gives you so much control that you can endanger your entire system.)

The Key to Change You can use NetInfo Manager to make changes to Mac OS X user names, passwords, and hints; all are stored in the NetInfo database.

To log in as the root user, click on the padlock icon in the lower left portion of the NetInfo Manager window, and type in your administrator password (the password you chose when you installed OS X). Now go to the Domain menu, select Security, and choose Enable Root User from the submenu. You'll be asked to create a password for the root domain. Do so, and you'll be able to log in as the user Root.—JOHN RIZZO

THE LAST WORD

The extra applications that come on the Mac OS X installation disc are certainly not the be-all and end-all of what we can do with this new operating system. Instead, they simply whet our appetites for the feast that will be available in the Mac's near future. **m**

JAMES BRADBURY is a former editor of *MacUser* magazine. *Macworld* Associate Lab Analyst BRETT LARSON writes about Mac OS X in his weekly online column (www.macworld.com/subject/macosx/). JOHN RIZZO is the author of *How the Mac Works* (Que, 2000) and creator of the MacWindows.com Web site.

OLD MAC NEW TRICKS

PUT THAT MAC BACK TO WORK AS A WEB SERVER

BY ADAM C. ENGST

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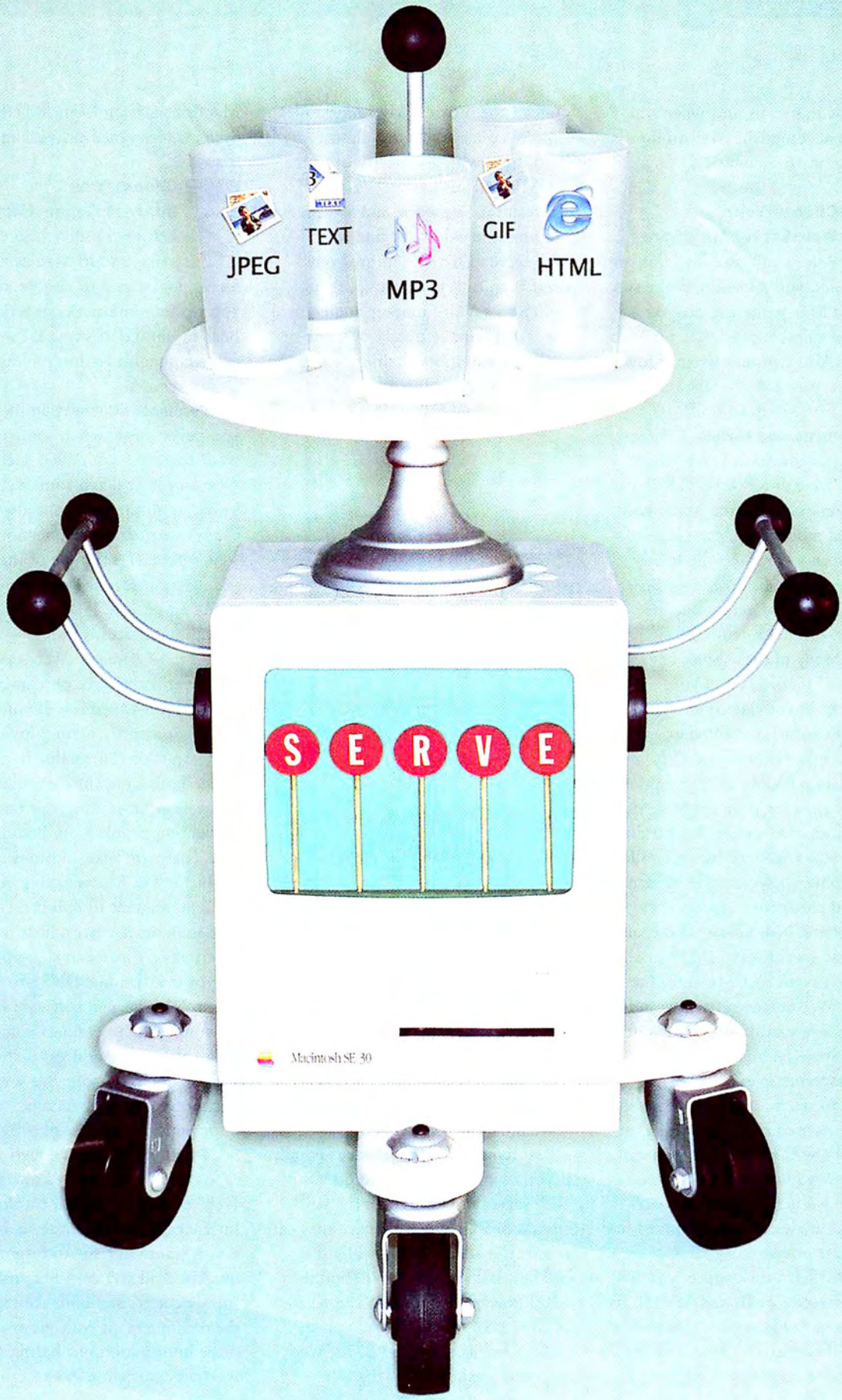
You don't need an expensive Web-hosting service to share pictures of your toddler with a few relatives online or to support a flood of visitors to your custom fly-tying business's Web site. You can turn an old, idle Mac into a server that will give you the ultimate control over your personal Web site. Serving Web pages doesn't require much CPU power, RAM, or hard disk space, making it a perfect use for an older Mac.

In the first article in our "Old Mac, New Tricks" series (*How-to,* June 2001), we told you how to get an old Mac up and running again. Now we'll show you how to turn it into a Web server. The process is fairly simple—and depending on

ILLUSTRATION BY DAN WINTERS AND GARY TANHAUSER


JPEG
TEXT
MP3
GIF
HTML
S E R V E
Macintosh SE/30

your raw materials and what you want to accomplish, you can do it for little or no money.

STEP 1 Choose Your Web-Server Hardware

Before you dive into this project, you'll need to make sure your old Mac gathering dust on a shelf is a suitable candidate for Web serving. Also consider what hardware upgrades your elderly Mac might need to bring it up to snuff.

Recommended Models For reasonable performance, I recommend a Power Mac or a PowerPC-based PowerBook or Performa (those with four-digit model numbers, such as the PowerBook 5300 or Performa 6400). A 68040-based Mac—those in the Centris or Quadra line, for example—will also work, albeit slowly. Many of these Macs have on-board Ethernet, but if your Mac lacks it, you'll need an Ethernet card to connect your server to other computers. The tricky part is finding the appropriate Ethernet card for your old Mac; the possibilities vary widely. See Farallon's LAN Product Selector (www.farallon.com/products/selector/) for information, and check for deals on eBay.

RAM and Disk Space Make sure your Mac has at least 32MB of RAM—enough room to run Mac OS, the Web-server software, and perhaps a few utilities. More is better, but since buying new RAM for older machines is expensive, ask around to see if anyone will give or sell you unused memory cards that will work with your Mac. You can check www.gurulounge.net if you're not sure what type of memory to buy, and www.ramseeker.com to find the lowest prices.

As for hard-disk space, you will need between 75MB and 150MB for the System Folder—plus whatever your Web-server software and site files require. Unless you're serving QuickTime movies, MP3 music files, or a lot of large images, almost any hard drive with a capacity of over 300MB will suffice.

Monitor, Keyboard, and Mouse An old monitor will work fine with your Web server. Or you can use your main monitor during setup, then switch to a VGA adapter and control the server Mac remotely over the network with a utility such as Netopia's Timbuktu Pro or the free VNC. (The VGA adapter—a small plug that lets

older Macs use monitors with VGA-style connectors—fools your Mac into thinking it has a monitor and enables the remote-control software to work.) The same goes for a keyboard and mouse—you will want them for initial setup, but after that you can rely on remote-control software most of the time.

Automatic Restart Device Finally, if you're going to check in on your Web server only infrequently, you should probably use a device that can restart the Mac automatically if it crashes, such as the $99 Rebound, $200 PowerKey Pro, or $179 Kickoff (for USB Macs), from Sophisticated Circuits (800/769-3773; www.sophisticated.com), or the $99 MacCoach, from Neuron Data Systems (www.neuronsys.com).

STEP 2 Choose Your Internet Connection

Before you dive into configuring an old Mac as a Web server, make sure to choose an appropriate Internet connection. Bear in mind that some ISPs—mostly cable companies—don't allow you to run servers.

Permanent Connection Because you never know when someone will want to access your Web site, you must not only leave your Web server running all the time, but also maintain a permanent connection to the Internet. Any type of Internet connection can be permanent, but DSL, cable, and ISDN are the most common choices.

IP Address Web servers generally have permanent addresses—stable IP numbers that identify them. However, the dynamic or changeable IP numbers handed out by many ISPs change whenever you restart your machine, preventing people from finding your site. There are two solutions to this problem: The first is asking your ISP for a permanent IP number. (That service sometimes costs a little more.) Alternatively, you can sign up with one of the dynamic DNS providers that rely on special software (running on your Mac) to connect whatever your dynamic IP address is to a specific domain name. See www.technopagan.org/dynamic/ for more information and a list of providers.

Fast Connection Though you can save money and can still operate your Web server if you opt for a slower Internet connection, faster is better if you want your site to respond quickly. And you can share this speedy connection with the rest of the computers on your network. (For more information on sharing your Internet connection via an Ethernet

network, see "Simultaneous Surfing," *How-to,* September 2000.)

The upload speed of your connection is particularly important. Many Internet connections, including most DSL and cable ones, are asymmetrical. This means the upload speed, which affects how fast your Web pages load on viewers' screens, isn't as fast as the download speed, which determines how fast you can grab a collection of MP3s off the Web, say.

To determine whether your upload speed is fast enough to meet your needs, find out the real speed of your connection using the tests at www.dslreports.com/stest. You'll want an upload speed of at least 56 Kbps; 128 Kbps or higher is better.

Domain Name Finally, though it's not essential, you should get a domain name for your site. Without a domain name—a simple, easy-to-remember URL such as www.macworld.com—people will have to enter long, complex links or your Web server's IP number into their browser to visit your site. Unfortunately, setting up a domain name can be quite confusing. If your ISP can't or won't help, check out The Public DNS, at soa.granitecanyon.com, or ZoneEdit, at www.zoneedit.com, for free domain-name service (the latter also supports dynamic DNS).

STEP 3 Choose Web-Server Software

Think realistically about your needs when choosing your Web-server software. Try to estimate how much traffic you will get and what utilities you may want. (See "Traffic Control" for help selecting the appropriate hardware, software, and Internet connection for the amount of traffic you expect.)

IT'S EASY TO START WITH APPLE'S PERSONAL WEB SHARING

Software for Light Traffic If you expect a few thousand hits a day at most and aren't concerned about your Web site's response speed, you can get by with free or inexpensive server software. These programs are also best if the Mac you're using is on the slow end of the models we recommend.

It's easy to start with Apple's Personal Web Sharing. It comes free with Mac OS 8 and later, it's trivially simple to set up (see "Web Sharing Control Panel"), and it offers Personal NetFinder (which provides a Finder-like listing of files) for people who might want to, say, share some baby pictures without building an entire HTML page. Personal Web Sharing's performance is OK, but the program is tweaked to work best in the background of a Mac that's doing everyday tasks. Another downside is that it doesn't have a live log (on which you can watch connections scroll by—many people find this quite entertaining). Also, if you're trying to figure out why your machine keeps crashing, why you can't get in via the Web, or just what in heck is going on, the live log is a big help.

Also free is Chuck Shotton's recently revitalized MacHTTP (www.machttp.org). MacHTTP performs well, it provides a live log (see "MacHTTP Log Watching"), and it's almost as easy to set up and maintain as Personal Web Sharing.

continues

Web-Server Software

COMPANY	PRODUCT	MOUSE RATING	COMPANY'S ESTIMATED PRICE	CONTACT	COMMENTS
4D	WebStar Server Suite 4.3	4 mice	$599	800/881-3466, www.webstar.com	Easy setup; additional features include an e-mail server, FTP server, support for secure connections, and database connectivity.
Apple	AppleShare IP 6.3.3	4½ mice	$450	800/692-7753, www.apple.com/appleshareip/	Includes FTP, e-mail, and print servers; offers file sharing for Macs and Windows machines.
Apple	Personal Web Sharing	N/A	Free	800/692-7753, www.apple.com	Easy setup; provides a Finder-like listing of files; best option for a Mac that's also being used for other tasks; no live log.
Chuck Shotton	MacHTTP	N/A	Free	www.machttp.org	Easy setup; best performance among the low-end options; provides a live log.
Stairways Software	NetPresenz 4.1	4 mice	$70	www.netpresenz.com	Relies on Personal File Sharing for access privileges; complicated setup; provides an FTP server.
Tenon Intersystems	WebTen 3.0	N/A*	$495	800/662-2410, www.tenon.com	Features the Unix-based Apache Web server, site caching to improve performance, and the PHP scripting language for dynamic Web content; includes a Web-based mail server, FTP and DNS servers, and a search engine.

N/A = not applicable. * WebTen 2.0.4 received 4 mice (*Reviews,* September 1998); a review of version 3.0 is pending.

Another alternative is the $70 NetPresenz, from Stairways Software (www.netpresenz.com). It relies on Personal File Sharing for access privileges, which makes it more complicated to set up and slows performance a bit. However, it also provides an FTP server for remotely uploading files via programs such as Interarchy or Fetch, which is useful if you want to let other people update your site from their own computers.

Of these Web servers, Personal Web Sharing is the easiest to use, and MacHTTP offers the best performance and the bonus of a live log. Purchase NetPresenz only if you need an FTP server for remote uploading.

Software for Heavy Traffic If you expect more than a few thousand hits a day, you'll need more-expensive high-performance software. For example, the main TidBits Web site relies on a Power Macintosh 7600 with 80MB of RAM running WebStar; that combination enables it to handle 30 simultaneous users, accounting for roughly a million hits a month, without breaking a sweat.

All the high-performance Web servers come bundled with extensive suites of other servers, including mail servers, search engines, and more.

The best-known Web-server software for the Mac is 4D's $599 WebStar Server Suite (408/557-4600, www.webstar.com). It provides not just a Web server but also an e-mail server, an FTP server, support for secure connections (in case you want to conduct e-commerce), a built-in search engine, and database connectivity through WebStar Lasso Publisher (useful for serving FileMaker or 4D databases via the Web). It has

a number of powerful features, yet it's easy to set up and it performs extremely well.

Tenon Intersystems' $495 WebTen (805/963-6983, www.tenon.com) is based on the Apache Web server. This means you can tap into the features and performance of this powerful open-source Unix server, which many of the major Web sites use. WebTen also features site caching to improve performance, a Web-based mail server and client, FTP and DNS servers, a search engine, and the PHP scripting language for making dynamic Web content. Despite its Unix-based power, WebTen remains a Mac application, with support for AppleScript, WebStar plug-ins, and more.

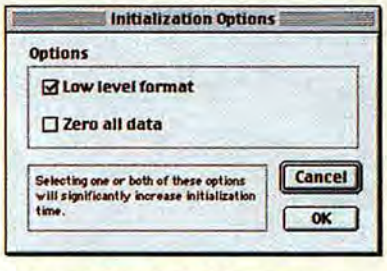
Finally, Apple's AppleShare IP ($450 for a ten-client license; 800/692-7753, www.apple.com/appleshareip/) provides a suite of services along with Web serving, including an FTP server, file sharing for Macs and Windows machines, an e-mail server, and a print server.

The most common choice is probably WebStar. WebTen is popular with people who want the ultimate in performance and have some Unix experience. AppleShare IP is best if you need its local file- and print-serving capabilities as well as Web and e-mail serving.

Utility Software To run your server without a monitor, mouse, and keyboard, you'll need to control it remotely with either Netopia's $140 Timbuktu Pro (510/814-5000, www.netopia.com) or the free, but somewhat flaky, VNC, from AT&T Laboratories Cambridge (www

Web Sharing Control Panel Starting up Apple's Personal Web Sharing can be as simple as selecting the folder that holds your Web files and clicking on the Start button.

MacHTTP Log Watching It can be a lot of fun (not to mention useful in troubleshooting) to watch the log of people accessing your Web server in real time.



Reformat Your Hard Disk To prepare a hard disk for Web serving, run Drive Setup. From the Function menu, choose Initialization Options, select the Low Level Format option, and click on OK. Then select the hard disk and click on Initialize.

.uk.research.att.com/vnc/). Timbuktu Pro comes in a twin-pack—one copy to run on your server, one to run on the remote machine—and offers niceties such as drag-and-drop file transfer.

Karl Pottie's $22 Keep It Up (www.vl-brabant.be/mac/kiu.html) is a useful shareware utility with which you can monitor your server remotely, launch and quit applications, restart the machine on a regular schedule or whenever programs crash, and receive e-mail alerts of low memory or disk space.

Traffic Control

Use this chart to select the hardware, software, and Internet connection that will meet the minimum requirements for your expected level of traffic. Although it's difficult to be precise, assume that a Web server set up for light traffic can accommodate a few thousand hits a day at most. If you expect more traffic than that, refer to the heavy-traffic recommendations.

	LIGHT-TRAFFIC MINIMUMS	HEAVY-TRAFFIC MINIMUMS
Mac CPU	68040 or PowerPC 601	PowerPC 603
RAM	32MB	64MB
Hard disk space	300MB	500MB
Connection speed	56 Kbps	128 Kbps
Software	Personal Web Sharing, MacHTTP, or NetPresenz	WebStar, WebTen, or AppleShare IP
Utilities	None	Automatic restart device, Keep It Up

STEP 4 Configure Your Mac

Once you've arranged for the proper Internet connection and gathered all the hardware and software you need, it's time to install and configure your software.

Reformat and Install First you'll need the Mac OS CD-ROM, preferably version 8.1 or 8.6. If you have the CD-ROM for only 8.0 or 8.5, you can download free updates to 8.1 or 8.6 from Apple's Software Updates Web site (asu.info.apple.com).

Since you may have no idea of the state of your old Mac's hard disk, I strongly recommend booting from the Mac OS CD-ROM and using Apple's Drive Setup to do a low-level reformat (see "Reformat Your Hard Disk")—you'll want to know sooner rather than later if the drive is dead.

After reformatting, install the Mac OS. It's best to do an Easy Install and let the installer give you everything. Afterward, use Extensions Manager to turn off unnecessary extensions and control panels that can take up memory and contribute to instability. If you're not sure what to turn off, consult either Dan Frakes's $15 InformInit (www.informinit.com) or Teng Chou Ming's $20 Extension Overload (www.extensionoverload.com).

Finally, install the Web-server software you've chosen, along with any utilities you've decided to use.

KEEP AN EYE OPEN FOR LOG FILES FILLING UP THE DISK ON BUSY SERVERS

Ready, Set, Go Starting up your Web server is easy—all you need to do is specify your Web-site folder (the location will vary depending upon which software you're using), copy HTML files and associated GIF or JPEG graphics to the Web-site folder, and launch your Web-server program. Be careful to put only files you want to serve to the public in the Web-site folder—you wouldn't want to publish any personal information by mistake.

All that's left is testing. Try accessing your Web site from another Mac on your network as well as from a computer outside the network. Be sure your ISP has updated any domain-name servers (if looking up your domain name fails, try the IP number). A final tip: Keep an eye open for log files filling up the disk on busy servers.

It's easy to miss a minor step, so if your site doesn't come up, don't panic—just retrace your steps.

The Last Word

It's easy and fun to set up your own Web server on an older Mac, and it can save you money—compared with paying a Web-hosting service. So bring that Mac down off the shelf and give it some dignity in its old age by letting it perform a useful task for which it's eminently well suited. **m**

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

LINKS

More Info: www.macworld.com/2001/04/13/howto/backup.html	More Info: www.macworld.com/2001/05/14/howto/kitchen.html	More Info: www.macworld.com/2001/subject/oldmac
Find out how to use an old Mac as a backup server.	Learn how to put your old Mac back to work as a kitchen assistant.	No time to type in URLs? Get a complete list of the links mentioned in this article.

ANTON LINECKER

Designing DVD Menus

Photoshop and DVD Studio Pro Make Menus Together

A great meal at a restaurant would be difficult without a menu, which tells you the dishes being served, how they're prepared, and how much they cost—a menu is an indispensable communication tool. Using a DVD also requires menus; they power a DVD's interactivity. Without well-designed and complete menus, users won't be able to reach your DVD's content—or won't even know what's available to them.

Earlier this year, Apple released a new tool for making DVDs: DVD Studio Pro ($999; 800/692-7753, www.apple.com). It's a valuable resource for professionals, but the application provides no way to create menus; you can add interactivity only to menus created elsewhere. This may seem odd, but authoring a professional-level DVD, like HTML editing, involves assembling final elements: the video and audio should already be compressed, and the menus already complete.•

So if you don't make your menus in DVD Studio Pro, where should you make them? In the industry standard: Adobe Photoshop (800/833-6687, www.adobe.com). The following steps illustrate how to efficiently build a DVD menu in Photoshop 6.0, but the basic instructions work in versions 4.0, 5.0, and 5.5, as well. Any static menu can be built on these steps; the complexity of the artwork is up to you. **m**

ANTON LINECKER is a video technical advisor and writer based in Los Angeles.

1

Make Your Background If interactive buttons are the brains behind DVD menus, backgrounds are the beauty. Though there are a few technical restrictions to keep in mind, backgrounds can be as simple or as elaborate as you wish. In this example, we start by making a background for a fictitious training DVD called "Scuba Safety."

In Photoshop, create a new project with an image size of 720 by 540 pixels and a resolution of 72 pixels per inch. This approximates the way your menu will eventually look on a TV screen. Choose the RGB mode.

Choose a color for the background, and fill it in using the Paint Bucket tool (under the Gradient tool in Photoshop 6). This gives you a base to work on, even if it's only temporary.

A

Place and size the images you want on your menu background A. Separate layers make the elements easier to manage in Photoshop. (Layers also add functionality to a menu once it's imported into DVD Studio Pro.)

TVs crop the outer edges of a picture. To avoid having important information cut out of your image, keep it away from the outer 10% or 20% of the image area. The middle space is called the *title safe area.*

Once you have the background you want, flatten the image (Layer: Flatten Image).

2

Design Your Title and Buttons Adding a title is straightforward; buttons are a little more complex. Clicking on a button in a DVD menu starts an event, such as playing a movie, displaying a picture, or changing languages. Although you add the action in DVD Studio Pro, you make the static image of the button in Photoshop.

With the Text tool, create and place the DVD title A. Overly thin fonts tend to flicker when displayed on a TV, so make sure your type has enough heft. You may want to add a drop shadow (Layer: Layer Style: Drop Shadow).

Lines are another potential problem. Make horizontal lines at least 2 pixels thick B, or they'll flicker.

For the first button, set the foreground color, making sure to avoid overly saturated colors, which can cause problems on NTSC displays. (NTSC is a video standard used in the United States.) Although buttons can be any shape, for this example, we selected the Rounded Rectangle tool and drew our button.

In the real world, buttons are usually raised from a surface. To imitate this look in the 2-D world of a DVD menu, give your button a raised appearance C by applying the Bevel And Emboss effect. (Layer: Layer Style: Bevel And Emboss). So viewers will know the button's purpose, you need to identify it. Use the Text tool to create a title, size it, and position it over the button.

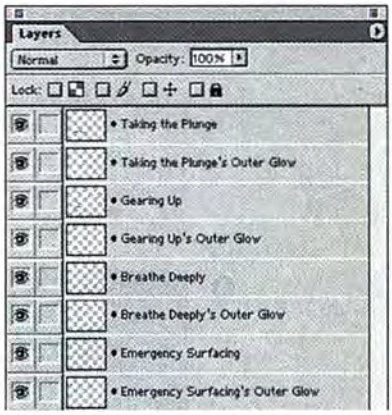
Text alone can be a button. With the Text tool, we created chapter titles D and made the text stand out from the background (Layer: Layer Style: Outer Glow).

3

Link and Merge Layers DVD Studio Pro doesn't recognize effects layers. You have to *rasterize* text and layer effects to make them visible on your finished DVD. (In previous versions of Photoshop, this process was called *rendering*.)

Under the Layer menu, choose Rasterize and then select All Layers.

Next, select each layer that has layer effects, and choose Layer: Layer Style: Create Layer. This separates the effects layers from the target layer A.



Link each layer with its effects layer. Click on the text layer so it's the active layer; then pick Merge Linked from the Layers Menu B.

When merging the text (in our example, *Play Movie*) onto the rounded rectangle, include the text and effects layers to complete the button C.

Finally, link your title and background image layers together and merge them.

continues

4

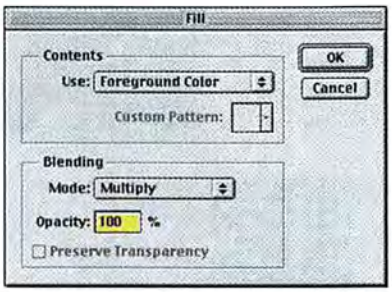
Add Layers and Button States In DVD Studio Pro, menu buttons have three states: normal, which is the default display; selected, when the remote control passes over the button; and activated, when the user has chosen the button. You can emphasize each state with different visual effects that exist as individual layers in the Photoshop file.

In step 2, you created your buttons' normal states. To differentiate the selected and activated states, add color casts.

To create a selected state for the Play Movie button, we duplicated the layer and called it "Play Movie-Selected." (This naming convention helps when you load the file into DVD Studio Pro.)

First, you'll set your foreground color. Go to Edit: Fill, and choose Foreground Color from the Contents pop-up menu A. As the Blending mode, select Multiply so the button's text will show through.

A



Duplicate the button layer again. We called this layer "Play Movie-Activated" and used a different color fill. You can even add an outer-glow effect in the same color if you want the button to appear to flash when activated on screen B.

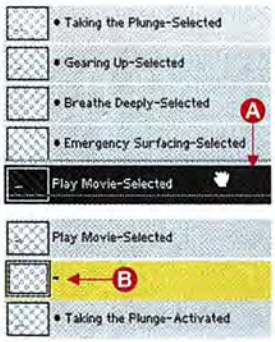
B

Repeat this process for the text buttons, but use the Normal Blending mode for the fill so the black text will also fill. Be sure to rasterize all effects and merge them with their layers. You should now have three separate layers for each of your buttons.

5

Check, Resize, and Save You have built your DVD menu. Now you must prepare it to be imported into DVD Studio Pro.

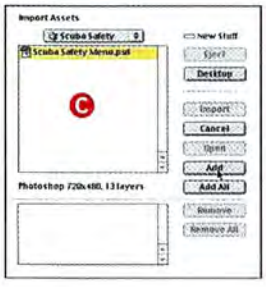
Check your work. Make sure that you've rasterized your layers and your text, and that each layer is properly identified.



Group your layers in button clusters (normal, selected, and activated) by clicking and dragging their titles in the Layers palette A.

Add new, blank layers between your button groups and name them "-" (hyphen) B. These blank layers will appear as dividers when you import the menu into DVD Studio Pro and will help you manage your buttons.

Next, resize the overall image. Under the Image menu, choose Image Size. Set the image size to 720 by 480 pixels. You will notice that this distorts your picture slightly, squeezing it vertically. This is normal. NTSC video is displayed at 720 by 480, but it uses non-square pixels. When you see the finished DVD displayed on a TV screen, the menu will be the correct size.



Finally, save the resized static menu, launch DVD Studio Pro, choose the File menu's Import command (⌘-I), and navigate to the Photoshop menu file C. Click on Add; then click on the Import button. Now the menu is in your Studio Pro Assets bin D, ready for you to add interactivity and make it functional.

D

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STEPHAN SOMOGYI

Take Command of Mac OS X

The Command Line Makes Your Mac More Powerful

Underneath its candy-coated Aqua interface, Mac OS X is based on Unix, an operating system that dates back to 1969. Unix and its archetypal user interface, the command line, look alien to many Mac users. Instead of using graphic methods such as clicking and dragging, you interact with the command line via terse, cryptic text. The commands and responses may be bewildering at first, but even the most visually oriented user should consider learning this lingo—some tasks can be accomplished much more quickly in the command line, and some are possible *only* in the command line.

In OS X, you reach the command line through an application called Terminal. This article, a collection of tips, will introduce you to Terminal and some essential Unix commands. Future articles will build on this knowledge, but if you find you're immediately thirsting for more, go to our Mac OS X resource page at www.macworld.com/subject/macosx.

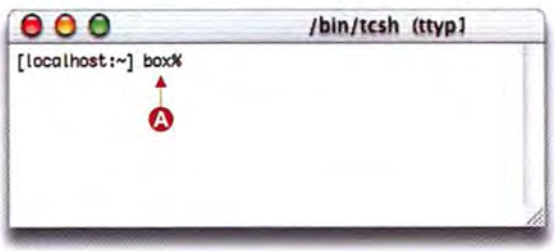
Just keep in mind that the command line is serious business. Even experienced users occasionally wipe out entire directories (and their contents) by accident. It's easy to overwrite existing files. And there is *no undo command* here. Always double-check what you're about to do so you avoid mishaps. **m**

Contributing Editor STEPHAN SOMOGYI thinks the addition of the command line to the Mac OS tool chest is a feature, not a bug. As with any power tool, though, appropriate protective gear should be worn at all times.

1

Find Your Way Before you can manipulate files and folders, you need to know how to get to them. Instead of double-clicking on folders to look inside, you have to tell the command line which folders to go to and which files to enumerate.

When you launch Terminal, you're greeted with a line of text that ends in a **%** (percent) character Ⓐ. This line of text, the *prompt*, indicates that the software that interprets your commands (the *shell*) is ready.



Every time you launch Terminal, you start from your OS X Home directory. To see which files are in the Home directory, enter **ls**—short for "list directory contents"—after the prompt, and press return.

In the traditional Mac OS, when you want to copy or duplicate a file, you first open its folder in the Finder. To do the same using Terminal, enter **cd**—short for "change directory"—in the command line. If you have a subfolder named "clam" in your home folder, entering **cd clam** will change the current working directory to that subfolder. To then list its contents, type **ls**.

If you want to move back up through the folder hierarchy, you can use **cd ..**—two periods mean "the directory above" when used as a directory name. A single period means "the current directory."

2

Manipulate Your Files Now that you can examine your files via the command line, you'll want to do things with them.

You use one command both to move files to other folders and to rename them: **mv**, short for "move." If you have a file named "pismo" that you want to change to "brighton," type **mv pismo brighton** and press the return key. But first make sure you don't already have a file by that name in the same location—if you do, it will be overwritten.

When you want to copy a file (rather than move or rename it), use the **cp** command, which, like the **mv** command, wants to know what you're copying and where you're copying it to.

TIP: Traditional Unix is case sensitive: if a file or folder is called "Ocean," you must enter the capital *O* every time. Although the HFS+ file system used by Mac OS X isn't as strict, using consistent capitalization is a good habit to get into, especially because OS X can mount volumes (either over the network or locally) whose file systems are case sensitive (for example, UFS).

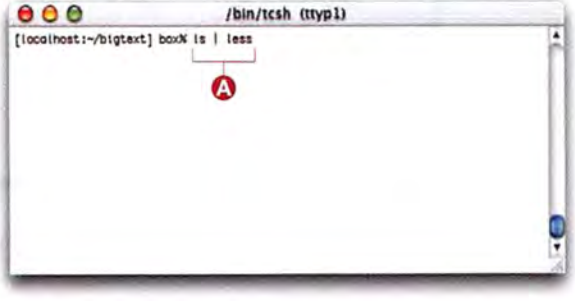
3

Control Text Flow Sometimes commands spew more lines of text at you than can fit on one screen. Fortunately, there are several ways to slow the onslaught and move through it.

The **less** command lets you move forward through reams of text one page at a time and also lets you move backward. This command is often handier than using Terminal's scroll bar.

When you combine commands by using a *pipe scheme*, you allow Unix to use one command's output as a second command's input. A pipe is represented by the | (vertical bar) character.

Say you want to list the contents of a directory that contains hundreds of files and folders. Enter only **ls**, and many of those files and folders will scroll past too quickly to read. The solution is to use a pipe, along with **less**, creating a code string that looks like this: **ls | less** Ⓐ.



This command tells the system to feed the result of **ls** to **less**, which then proceeds to display it one page at a time Ⓑ.

continues

4

Wild Cards Wild-card characters are among the most powerful—and most perilous—features of the command line because they allow you to affect many files with one command. In this example, I combined some now-familiar commands with wild cards. When you explore wild cards, try not to be too all-encompassing: use them cautiously, particularly when deleting files, so you don't delete or damage files you care about.

When constructing commands, you frequently have to specify which file or files you want to affect. Instead of typing the name of each file, you can use a wild card to make the computer do the work. The * (asterisk) wild card basically translates to "anything." Another useful wild card, **?**, translates to "any single character."

Suppose you have a folder called "bigtext" in your home directory; it's filled with text files, and you want to examine the contents of those files.

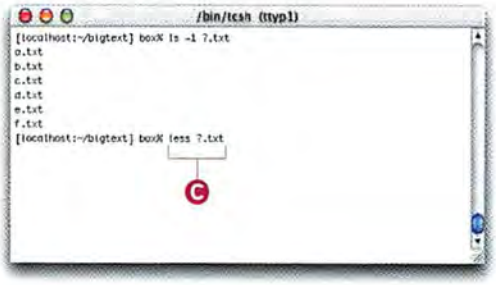
From your home directory, enter **cd bigtext**.

To view the contents of the files, enter **less *.txt** Ⓐ. Using a wild card this way displays every file in the current directory that has a *.txt* ending.

After you enter **less *.txt**, press return. Though results will vary based on your files, you should see output similar to the example Ⓑ.

Ⓑ

But say we want to see only those text files with a single-character name. Simple enough: enter **less ?.txt** Ⓒ, which displays any file with a name that ends in *.txt* and has only a single character before the period.



After you press return, you should see something like the output in the example Ⓓ.

Ⓓ

You can also combine wild cards: **less *.t?t** shows you the insides of all files ending in *.txt*, *.tot*, and *.trt*, for example, but not those ending in *.tt*.

Many Mac files have spaces in their names, so it's useful to know how to handle this situation on the command line as well. If you don't show the shell that the space is part of the file's name, it will treat the space as a file-name separator. When a space is part of a file name, put the whole thing inside single quotation marks. **less 'Pearls ??.txt'** will display the contents of files named "Pearls 00.txt," "Pearls 99.txt," and any similarly named files in between.

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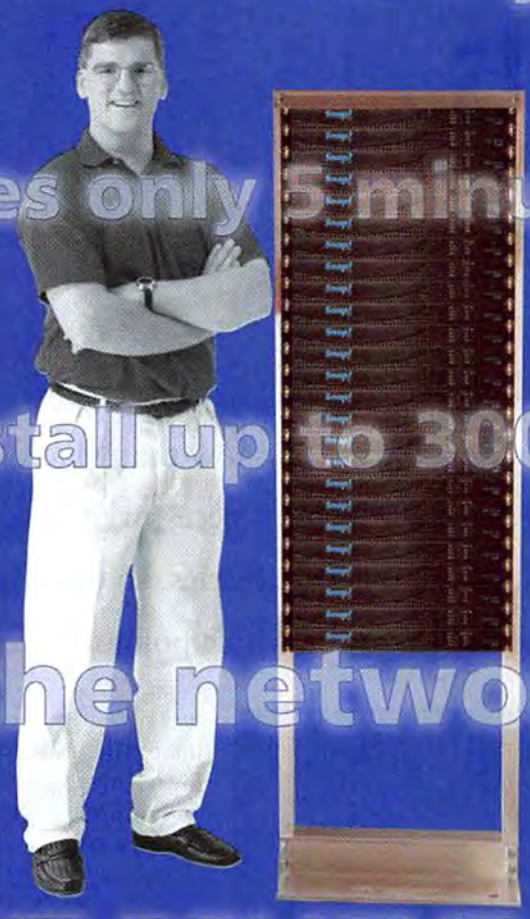

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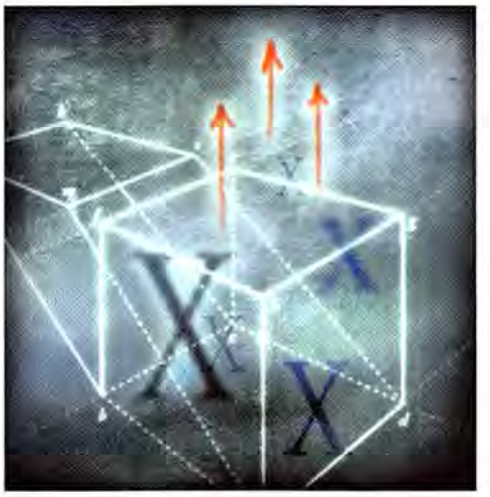
STEPHAN SOMOGYI

Mac OS X Secrets

We Mac users have long been proud that we don't have to type in commands to use our machines to their fullest. That's still true, but now that Mac OS X has opened up the Unix command line, we have all the tools necessary to take advantage of some powerful programming and scripting capabilities, so our Macs can do more of our odious work. And after all, isn't that the whole point of a computer?



Programming is a lot like cooking—a category of activities that spans a broad spectrum, from the complexity of *Iron Chef* to the culinary travesty of microwaving a hot dog. Programming and cooking both can be done at many different skill levels, but even amateur chefs can make tasty food, just as beginning programmers can create useful scripts. And like learning to cook, learning to write scripts may appear daunting at first.

In this column, the first of a series examining OS X's geekier innards, you'll learn how to use the popular scripting language Perl, which is built into OS X. We'll show you how to build a script that converts a Mac text file's line endings to line endings that Unix can interpret. (This will enable the use of Unix-based text-processing tools on the file's contents.) Although developing the script may seem like quite a bit of effort, the results will come in very handy if you ever need to convert multiple text files. (To learn more about specifying multiple files on the command line, see "Take Command of Mac OS X," *How-to*, elsewhere in this issue.) We hope that this example will serve as an appetizing taste of OS X's rich flavors.

How to Write a Perl Script

First, you need to fire up a text editor such as OS X's TextEdit, BBEdit, or if you're already familiar with the command-line realm, one of the traditional Unix text editors such as pico or vi. Then jump right in by typing the following line:

```
#!/usr/bin/perl -w
```

This first line announces to the operating system that it's dealing with a Perl script. The `-w` at the end of the line tells Perl that it should be particularly stringent about its interpretation of the script and display warnings if it encounters code that it considers suspect. Get yourself in the habit of adding `-w` to your scripts: doing so will often help you discover and fix scripting problems before they become a pain in the neck.

```
# linebreak characters: \x0d - Mac, \x0a - Unix
```

In this line, `#` indicates a comment for use by the author of the script or someone else reading it, so Perl will ignore the rest of the line. This comment explains the codes for the Mac and Unix line-break characters. Later, outside of the comment, the `\x` notation will tell Perl that we're using hexadecimal numbers to represent line endings.

```
{
```

Perl uses braces (sometimes called "curly brackets") to group pieces of code. This outermost set of braces in this script is an optional visual indicator of where the script's main part begins and ends.

```
foreach $inFileName (@ARGV) {
```

The script uses this `foreach` loop to work through all the names of files that the script will convert to Unix-readable text. Each individual file name is stored in a separate

ALICIA BUELOW

Perls of Wisdom Writing a Perl script in OS X's command line can be easier than it looks if you follow our instructions.

element of an array—a collection of variables—called @ARGV, which Perl creates.

This line translates to "Take a file name from the @ARGV array, put it in the variable called $inFileName, and run the code enclosed in the following set of braces; continue doing this until you run out of file names in @ARGV." In Perl, all variables begin with the $ character except arrays (which are preceded by @, like @ARGV) and hashes.

```
open (INTEXTFILE, $inFileName);
```

This line tells Perl to open the file, whose name it has plucked from @ARGV, and create a reference to it, which we've named INTEXTFILE. We'll use this reference any time we have to read from this file; Perl wouldn't know which file we were referring to if we didn't name it explicitly.

```
open (OUTTEXTFILE, ">". $inFileName . ".converted");
```

This line creates the new file that will contain our converted text, and a reference called OUTTEXTFILE. The rest of the line contains the file's name; the > character is shorthand for "create the file" and doesn't actually affect the file's name. The variable $inFileName contains the name of the original file, and the script will add *.converted* to the end of its name (so the original is not overwritten). The periods between the elements of the file name tell Perl to combine them into a single string of text.

```
$textFile = <INTEXTFILE>;
```

This statement tells Perl to read the entire text file from INTEXTFILE and put it into the variable $textFile. Make sure the file isn't too big (larger than about 100K); even though OS X has Unix-style virtual memory, you can't assume that exorbitant amounts of memory are available.

Now for the Heavy Lifting

This line does all the real work in the script and is consequently rather dense:

```
$textFile =~ s/\x0d/\x0a/;
```

Perl has a built in search-and-replace function, represented by s. When invoking this function, you specify what it should search for and replace with; these two strings are bounded by / characters. We want to replace Mac line-ending characters with the Unix ones, so those are the two strings we've used in the search and replace fields. Using =~ tells Perl to perform the search and replace on the contents of $textFile and then put the result back into $textFile.

```
print OUTTEXTFILE $textFile;
```

Once the conversion's done, use the print function to write the contents of $textFile to your output file.

```
close (INTEXTFILE);
close (OUTTEXTFILE);
```

These final statements close the input and output files, to keep things tidy. Add two closing braces to end your bracketed chunks of code, and that's it.

When you're done, save this script into a file named "lineconvert.pl"—making sure to give this file Unix line endings. Then use the command line's chmod command to set the script's attributes, so the operating system knows it's an executable script. To do this, type **chmod 744 lineconvert.pl** into the command line. (To learn more about the chmod command, enter **man chmod** at the command-line prompt.)

Using Your Perl Script

Say you have a Mac text file named "mac.txt" and you want its contents to have Unix line endings. You invoke your script by typing **./lineconvert.pl mac.txt** in the command line, and it performs the conversion. You end up with a file called "mac.txt.converted," with contents that have Unix line endings. Ta-da! Now you can modify the script to create a Unix-to-Mac version, for example.

One of the many features you can add to your script is improved error handling. This is particularly important because errors outside of your control do occur, and you don't want them to destroy your data.

Onward

Our example introduces a few of the ingredients in the large and well-stocked kitchen that is Perl programming. And Perl has countless uses beyond changing text files: it can fill the gaps between databases and Web servers to help you create dynamic Web sites. You can even use it to catalog your MP3 archive.

To explore Perl further, browse CPAN, the Comprehensive Perl Archive Network (www.cpan.org). If you find packages that seem useful, you may want to get your hands on *Learning Perl*, second edition, by Randal L. Schwartz and Tom Christiansen (O'Reilly & Associates, 1997). Using it as your beginner's cookbook, you'll soon be concocting Perl scripts that save you time and drudgery. **m**

A longtime MacPerl user, Contributing Editor STEPHAN SOMOGYI is no longer afraid of regular expressions.

More Info: www.macworld.com

For a list of helpful links to Perl resources on the Web, type **OSXSecretsPerl** in Macworld.com's Search field.

LINK

CHRISTOPHER BREEN

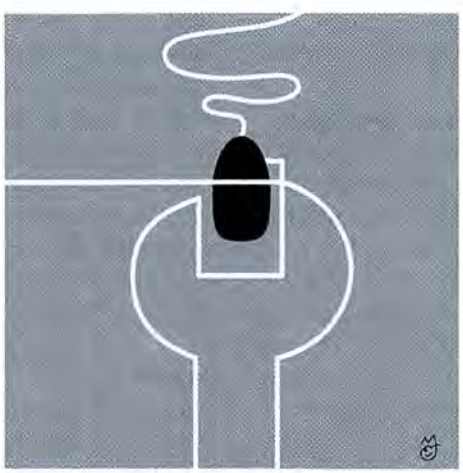
Mac 911

Ah, July, a lovely month in the Northern Hemisphere. A month when we can enjoy the pleasures of outdoor dining, risk setting the neighborhood on fire with an errant bottle rocket, and smile broadly at the wonders revealed during the East Coast installment of Macworld Expo. And speaking of eating, burning, and beaming, that's exactly what we'll discuss in this month's *Mac 911*.

Gobbled Gigabytes

Q. **My hard drive is shrinking right in front of my eyes! I thought I had 3.5GB of available disk space, but my Mac now tells me that I have less than 1GB. What's up?**

"BRUCEFPA"
Macworld.com forums



A. At first blush, this is indeed a scary problem, Brucefpa (Fulsome Podiatrist's Assistant? Feverishly Pulsing Acquaintance?). Thankfully, only a couple of factors can make disk space disappear in this way, and the tools for putting things right are only a download away.

Disk space doesn't just disappear—a file or group of files has scarfed up those gigabytes. More often than not, the scarfer in question is some kind of invisible temporary file. Adobe Photoshop 6.0 is notorious for creating enormous temporary files and failing to give them the boot once the application shuts down. Likewise, Microsoft Word and the classic Mac OS (version 9 and earlier) can create—and neglect to dispose of—their own invisible temporary files.

There are a few ways to get rid of these disk-space thieves. You can use Sherlock to find the invisible files on your hard drive and delete them by hand, but I wouldn't recommend it; before I trash invisible files, I want to know a bit more about them. So my first line of attack is Search-Ware Solutions' Eradicator (www.swssoftware.com). This simple—and free—application reveals the contents of the invisible Temporary Items and Cleanup At Startup folders and allows you to selectively delete files within them. If you'd like more control over what you trash and what you keep, check out Monkey-Bread Software's $15 Ghost Hunter (www.monkeybreadsoftware.com). Ghost Hunter allows you to see all the invisible items on your Mac's hard drive and to move, trash, and make these files visible from within the program.

Be careful when vaporizing files: unless you know what you're doing, it's best to delete only those files inside the Temporary Items folder found at the root level of your hard drive. And do this only when other applications aren't running—otherwise you could kill a file that another application is using.

If Photoshop 6.0 is overwhelming your hard disk with undeleted temporary files, you should be able to solve the problem simply by downloading the free Photoshop 6.0.1 update (www.adobe.com/products/photoshop/main.html). This update reportedly kills the temp files that Photoshop 6.0 leaves behind.

Finally, Bruce, there's another possible explanation for your disappearing disk space. Maybe, like me, you've installed Power On Software's Rewind ($80; 800/344-9160, www.poweronsoftware.com), a utility that can restore your Mac to a previous state. Rewind causes disk space to disappear when it's updating its invisible cache file. If you leave your Mac idle for ten minutes, that drive space should be restored to the level you set in Rewind's preferences. On a couple of occasions, however, Rewind

FELIX SOCKWELL

Tip of the Month

If you have Microsoft Outlook Express configured to run in the background and check your e-mail at regular intervals, you may be annoyed when you hear the new-mail alert, switch to Outlook Express, and discover that you've just received another piece of spam.

To avoid such false alarms, create a new folder and call it Junk. Next, create a Mail Rule that moves any mail Outlook Express designates as junk mail to this folder. Finally, add a Play Sound action that plays a different sound when a message appears in this folder (see "Rule Out Spam"). When you next hear that sound, you'll know that there's no need to rush to read your mail.

CHARLES MOON
Arcata, California

For more information about Outlook Express junk filtering, go to www.macworld.com/2000/10/howto/corral.html.—Ed.

Rule Out Spam Use Microsoft Outlook Express's Rules to move spam to its own folder and issue a unique alert sound.

never did relinquish the disk space on my PowerBook, and I had to uninstall the program to purge its gargantuan database.

Disc Burner Doesn't

Q. I can't seem to make my Yamaha CRW8824S internal CD-RW burner work with Apple's Disc Burner. It's on the Disc Burner compatibility list, so what's the problem?

BETH GORTON
San Antonio, Texas

A. I can easily clear this up, Beth. The letter *S* that follows the drive's model number indicates that it's the SCSI model, and despite Apple's claims of compatibility, you won't be able to use Disc Burner's Finder interface to burn data CDs. As you've no doubt discovered, when you attempt to install Disc Burner on your Mac, an error message waggles its virtual finger and tells you that Disc Burner is incompatible with your Mac. Your SCSI CD-RW drive *is* sufficiently compatible to burn audio CDs from within iTunes, but for data CDs you'll need to use the copy of Toast that was undoubtedly bundled with your burner.

Infrared Printing

Q. I just got a new PowerBook G4 and would like to use its IrDA port to print to my old HP LaserJet 5MP. How do I set this up?

TED LANCASTER
Akron, Ohio

A. Funny you should ask, Ted. It just so happens that a friend who dropped by the house the other day posed the very same question. He had come by to gloat over his new Titanium PowerBook G4, and, spying the infrared port that adorns the HP LaserJet 5MP printer sitting in my office, he asked, "Do you suppose I could print from my PowerBook to that printer via infrared?"

Explaining that such a procedure is devilishly difficult to set up, I persuaded the poor sap to leave his PowerBook with me for a few days. After spending those days playing Oni with his Titanium portable and relishing every double punch and flying kick, I realized that if I didn't actually demonstrate how to print via infrared when he returned that afternoon, he'd know I'd hoodwinked him. Here's how simple this operation really is:

Open the AppleTalk control panel and select Infrared Port (IrDA) from the pop-up Connect Via menu. Now launch the Desktop Printer Utility—it's inside the Utilities folder, which is in the Applications (Mac OS 9) folder at the root level of the PowerBook's hard drive. In the New Desktop Printer window, select Printer (Infrared) from the list of printers and click on OK.

Move the PowerBook to within three feet of the printer's infrared port (making sure that the two machines' infrared ports face each other), and click on the Auto Setup button in the resulting window. After a fair bit of cogitation, the Desktop Printer Utility may ask you to select a PPD file if it doesn't find a native HP printer driver. Select a basic printer description such as LaserWriter, click on OK, name your printer, and save it to the desktop. When you next wish to use this printer, just choose AppleTalk's Infrared setting, point the PowerBook at the printer, and proceed as you normally would. **m**

To get a gander at Contributing Editor CHRISTOPHER BREEN's mug, visit Breen's Bungalow, the video feature he produces each month for the CD-ROM bundled with newsstand copies of *Macworld*.

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*.

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Feature Presentations*
Kevin Browne, General Manager, Macintosh Business Unit, Microsoft Corporation
Thursday, July 19, 2001
9:00 am – 10:00 am

TBA
Friday, July 20, 2001
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Friday, July 20, 2001
11:00 am – 12:00 pm

Exposition Hall
Wednesday, July 18 – Thursday, July 19, 2001
10:00 am – 6:00 pm

Friday, July 20, 2001
10:00 am – 4:00 pm

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Application Spotlight: FileMaker Pro

One of the most important and popular applications in the Mac universe is FileMaker Pro. We're pleased to present an Application Spotlight track exclusively for developers of this amazing tool. Spend 3 days with the FileMaker gurus covering advanced development techniques. Tips, tricks and inspiration galore in this hardcore track for the hardcore FileMaker developer.

The Mac Manager Track

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

Digital Media

The Mac is a mainstream tool in the digital media. Apple technology provides best-of-class tools to produce and deliver the highest quality content. Attend sessions in this track to hear from industry experts and top practitioners how to use these tools to create quality material and delivery experiences to your customers. This track mixes practical tools advice with brilliant industry perspectives to deliver a composite picture of deploying the Mac in the digital media arena.

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Visit www.macworldexpo.com for continuous conference and event updates!

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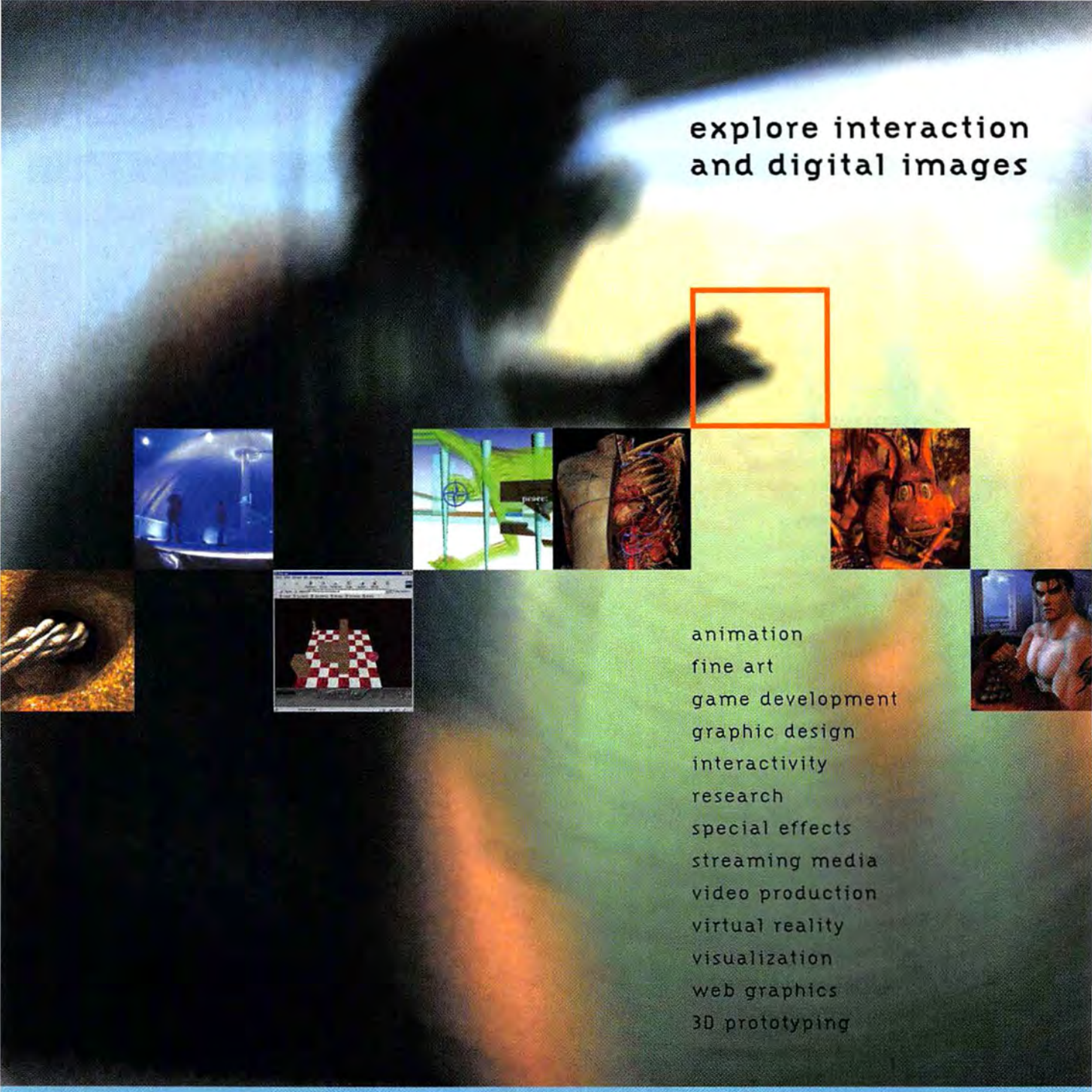
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Macworld congratulates the winners of the Macromedia Flash 5 DESIGN A SITE FOR USABILITY CONTEST

The Macromedia Flash 5 Design a Site for Usability contest garnered more than 700 entries from around the world, proving that designers everywhere are enthusiastic about creating usable sites with Macromedia Flash. We hope this contest helps raise awareness about important usability issues on the Web, and brings user-centric design into focus.

As a community we must continue to strive for the best user experiences possible on the Web, fusing great form (creativity) with exceptional function (usability). Together, we will shape what the Web can be.

We'd like to thank everyone who participated in the contest, offer our hearty congratulations to the winners, and say a special thanks to the judges.

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http://www.vbailey.dircon.co.uk
James Straffon

http://members.telocity.com/~holsum/snug.html
Lary Stucker

http://www.mninter.net/~masimo/
Matthew Plumstead

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Michael Stern

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#956216	533	128MB	256MB*	384MB	40GB	1MB L2	Yes	CD-RW	Yes	NVIDIA GeForce2 MX	$2,194	$62/mo**
#957453	533(2)	128MB	256MB*	384MB	40GB	1MB L3	Yes	CD-RW	Yes	NVIDIA GeForce2 MX	$2,494	$70/mo**
#957951	733	256MB	256MB*	512MB	60GB	1MB L3	Yes	CD-RW	Yes	NVIDIA GeForce2 MX	$2,994	$84/mo**
#956565	733	256MB	256MB*	512MB	60GB	1MB L3	Yes	DVD-R/CD-RW Combo	Yes	NVIDIA GeForce2 MX	$3,494	$98/mo**

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FREE RAM	64MB
TOTAL RAM	128MB
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CD-ROM	YES
56K Modem	YES
USB Ports	2
FireWire Ports	2
iTunes and iMovie 2	YES

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MHz	500
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TOTAL RAM	192MB
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56K Modem	YES
USB/FireWire Ports	2
iTunes and iMovie 2	YES

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MHz	600
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FREE RAM	128MB
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56K Modem	YES
USB/FireWire Ports	2
iTunes and iMovie 2	YES

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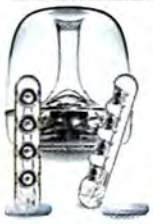

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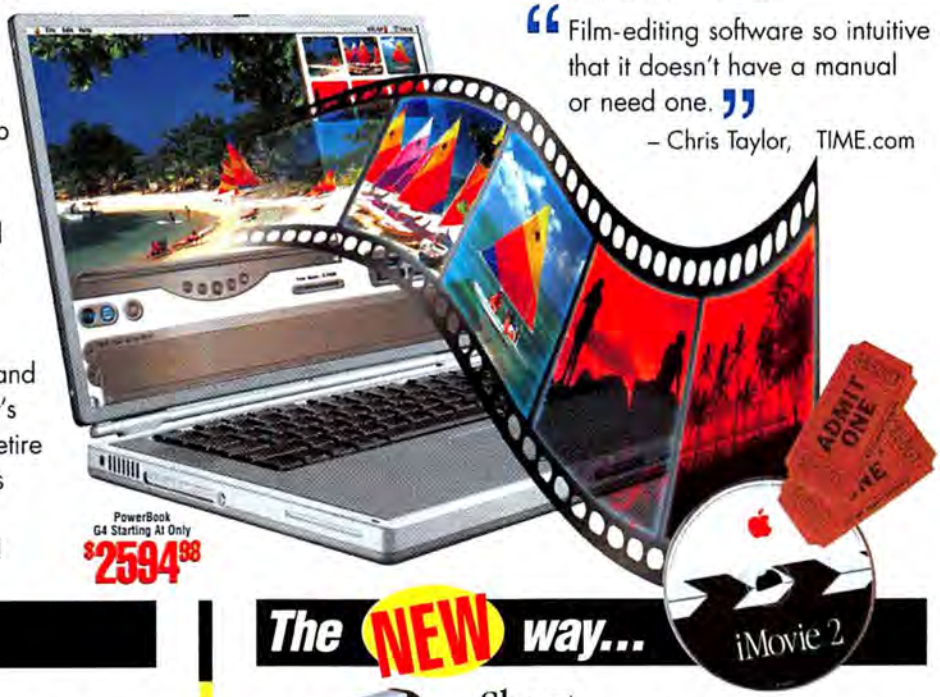

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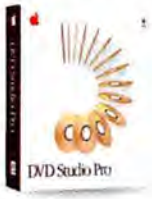

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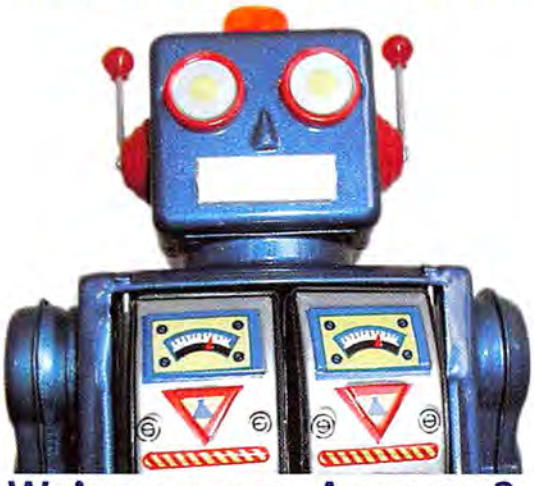

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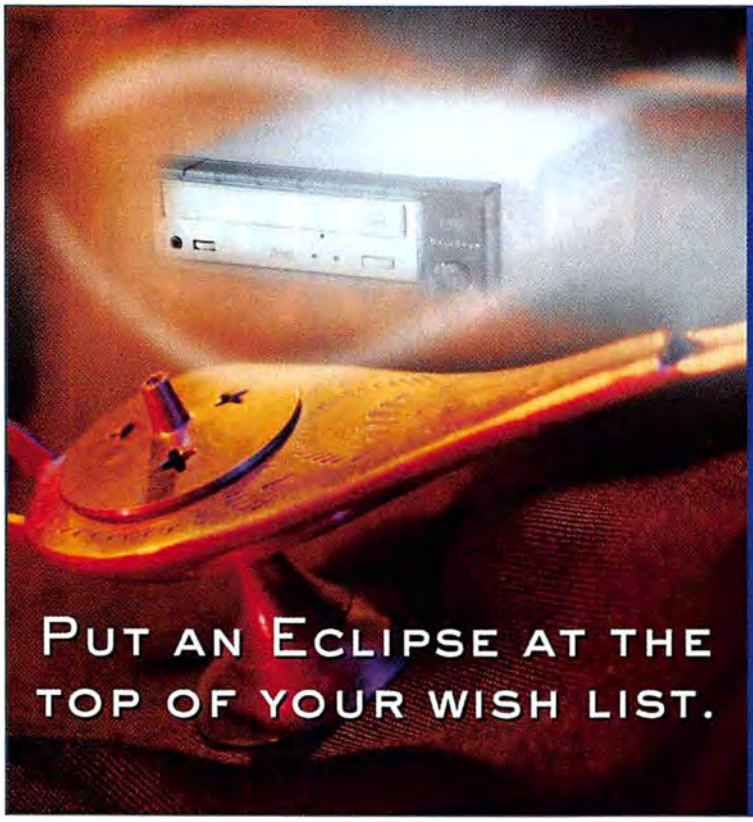

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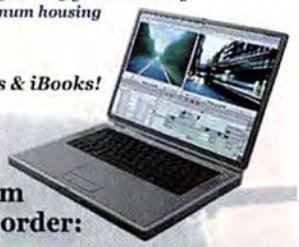

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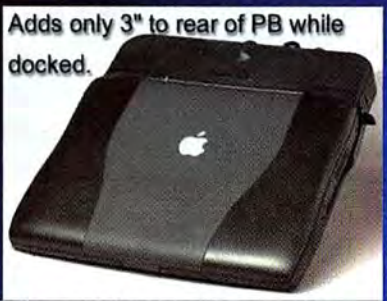

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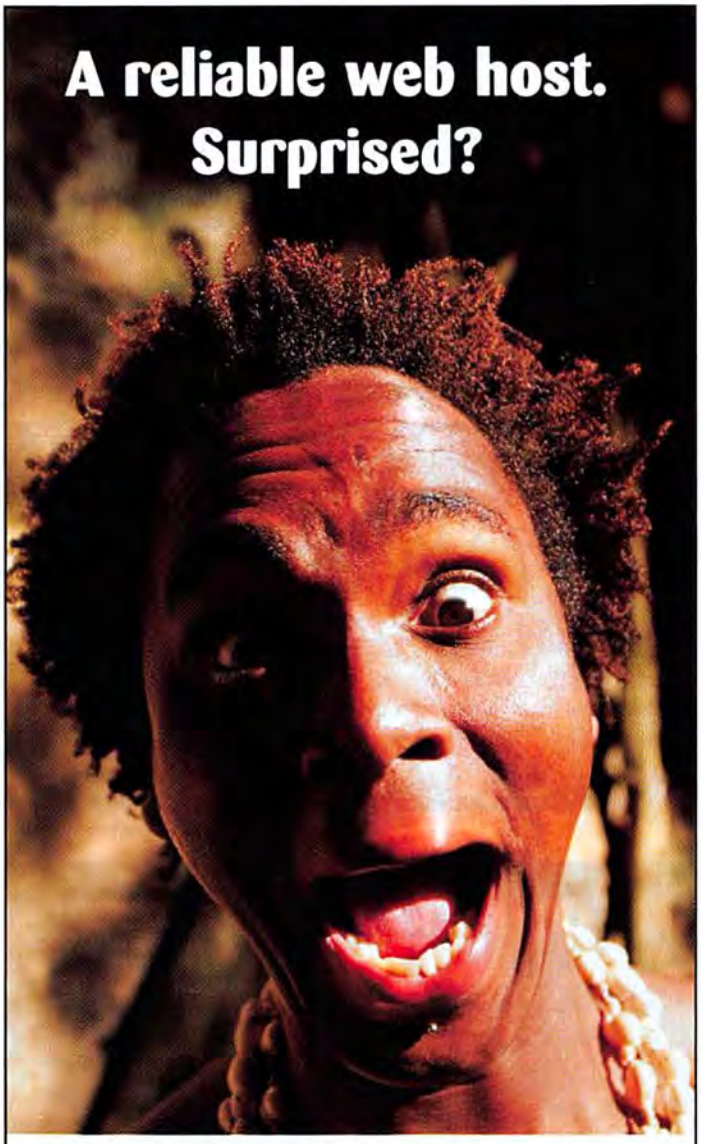

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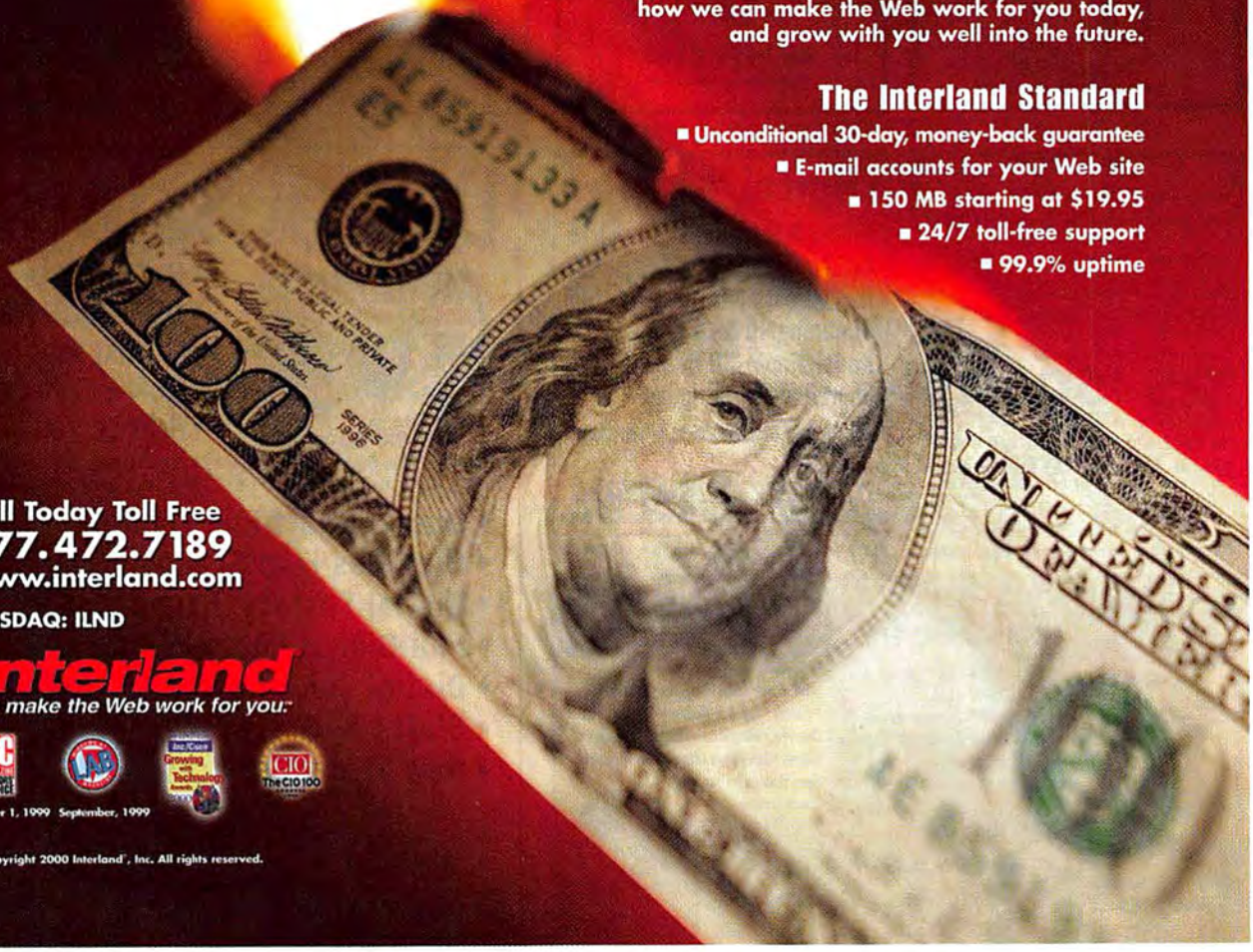

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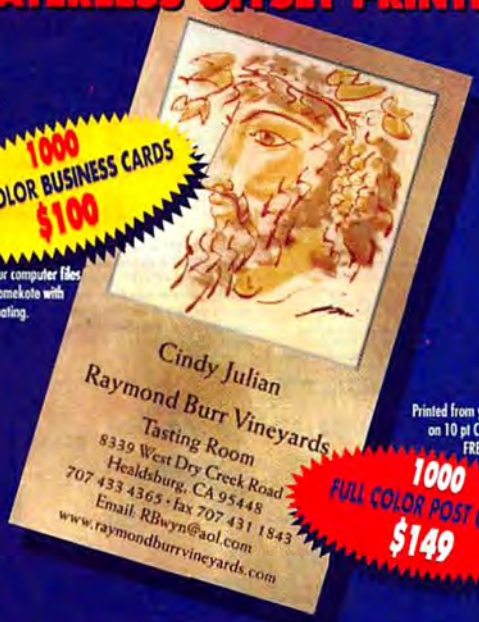

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Chewbacca. But my dilemma illustrates both the importance of the handheld computer and the inelegance of current offerings.

The Newton was ahead of its time. We're just now at the leading edge of the major cultural shift it anticipated: year after year, we're getting closer to the day when the majority of the adult population is made up of people who grew up with computers. The handheld computer is merely a thriving market space today, but before long those things are gonna be like underpants: unless you're participating in an activity that offers a distinct advantage to nudists, not having 'em on your person marks you as an exceedingly odd individual. In this new world, a company without a serious presence in the pocket-doohickey realm is a company behind the eight ball.

For now, Apple's sole presence in that enormous market space is, well, Palm's support for Mac OS. It just seems wrong. If Palm is fulfilling every Mac user's expectations of a Mac handheld, why do cities burn every time there's a new rumor of an—*Ask for it by name!*—Apple Consumer Pocket Electronic Doohickey? We all want Apple to get back into the handheld world, and not just because we're so hard-core that we bleed green, yellow, orange, red, purple, and blue. We want it because it's an opportunity for Apple to do what it's great at. It's *good* at making iMacs in wacky colors, but it's *great* at making, say, the first totally amphibious Web server, or a notebook that doubles as a pop-up opera hat. Apple is the only company both eager and able to present truly fresh damn-the-torpedoes ideas.

The thought of Apple getting back into the handheld game is tantalizing even if you believe that Apple should stay out of the handheld-hardware business altogether. Imagine Apple creating new connectivity software that allowed the Mac to work far more intimately with a Palm device than any Windows machine could, for starters.

After your third or fourth beer, it may even occur to you that the iPaq uses the StrongARM processor—the same one powering the next-generation Palms—and that both handhelds will have flashable ROMs, so their original operating systems can be wiped and replaced with something better, written by a company that's good at spotting and eliminating the most cumbersome aspects of the status quo.

If you keep drinking until your friends, ignoring your seemingly incoherent mumblings, trick you out of your car keys and put you to bed on the nearest sofa, you might drift off to sleep remembering that, hey, you know, Apple still *owns* the Newton OS. And wasn't it written for the StrongARM processor? What if Apple . . . *grrzzzzzzzzz.* **m**

ANDY IHNATKO has written about the Mac for years, and yes, he does own a holster for his Newton.

ANDY IHNATKO

Newton's Ghost

Sure, the Palm Is Great. But I Want an Apple Handheld!

A NEW POCKET COMPUTING device is coming from Apple. If the company isn't planning to release one soon, then it already has some prototypes built and working as proof-of-concepts. Or it's aggressively white-boarding basic ideas on what sort of handheld it hopes to make someday. At least, it refuses to confirm or deny that it might possibly release one eventually. If you don't believe that, maybe this one will work for you: a year or two ago when Steve Jobs modified the tic-tac-toe diagram he uses to represent Apple's hardware strategy, he left a square tantalizingly blank, so there's every reason to—

Oh, who the hell am I fooling? For all we know, Jobs could have intentionally left that space blank for tax purposes. At the moment, the most realistic analysis is that Apple's next handheld will be a flop because the hyperintelligent supermonkeys who will probably rule the planet by then will lack the opposable thumbs and the fine motor skills required to operate a stylus.

Yet folks are still hot for Apple to reinterpret the personal digital assistant for this millennium—perhaps against all logic. But Palm owns the bloody category. It's got a great product that's only getting greater, and even Microsoft is having a hard time convincing people otherwise.

Out Apple-ing Apple

Palm is probably the only company other than Apple ever to design a computer that goes beyond simply being usable to actually being *likable*. Even the very first Palm Pilot had personality and identity, and gave you the impression that it was the result of a philosophy, not of a business plan. Palm seemed to grasp (and it still does) that the development of computer hardware and software is a *creative* endeavor—no less than a great book, movie, or album is—and that the price of endless focus-grouping and market analysis is mediocrity.

Maybe the folks at Apple took that principle to the extreme with the Newton. If they had done a little more analysis before building 'em, perhaps they would have discovered that the only way users can fit Newton into convenient pockets is if they first borrow old leisure suits from their dads. But the Newton OS remains the gold standard in handheld operating systems. The Palm OS is at first forgivably clunky and then endearingly so. But when you put a Palm next to the manifestly elegant and powerful aura of a Newton, you're left wondering why no one's making anything that can approach it, even today.

You think I'm kidding? Years after the Newton was discontinued—and after I finally determined that I was expending more calories keeping my Newton working with incompatible hardware and software than its developers had spent designing it—it still takes no fewer than three items to spackle the hole my Apple MessagePad 2100 left behind.

My Palm is the best thing for managing contacts and appointments, has the best library of mobile apps and games, and has the most elegant operating system. My Compaq iPaq runs PocketPC, which is the first version of Windows CE that inspires me to write about it calmly instead of causing me to jump up and down, gesture wildly, and shriek incoherently, as you might behave after a car turned right without signaling and knocked you off your bicycle. It's the best handheld computer for working with large quantities of desktop data (databases, documents, sound, and graphics). And for the most important function of my Newton, I'm back to using a pocket sketchbook. No other pen-based handheld computer is worth a shaved elk hoof if you need to jot down notes longer than a sentence or two.

Generation Handheld

Maybe I'm not a typical user. I mean, I actually enjoy the serene knowledge that in any room, I'm the person carrying the most microprocessors, even if it means wearing them all on a bandolier across my chest like

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