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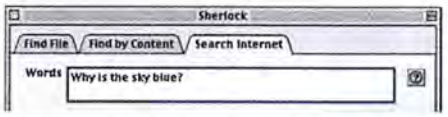

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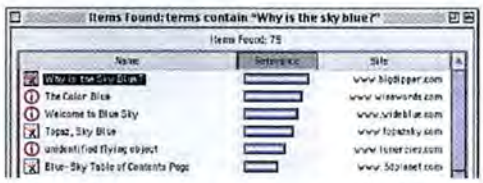

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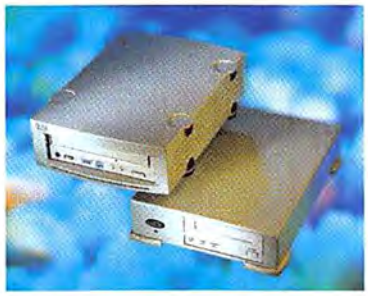

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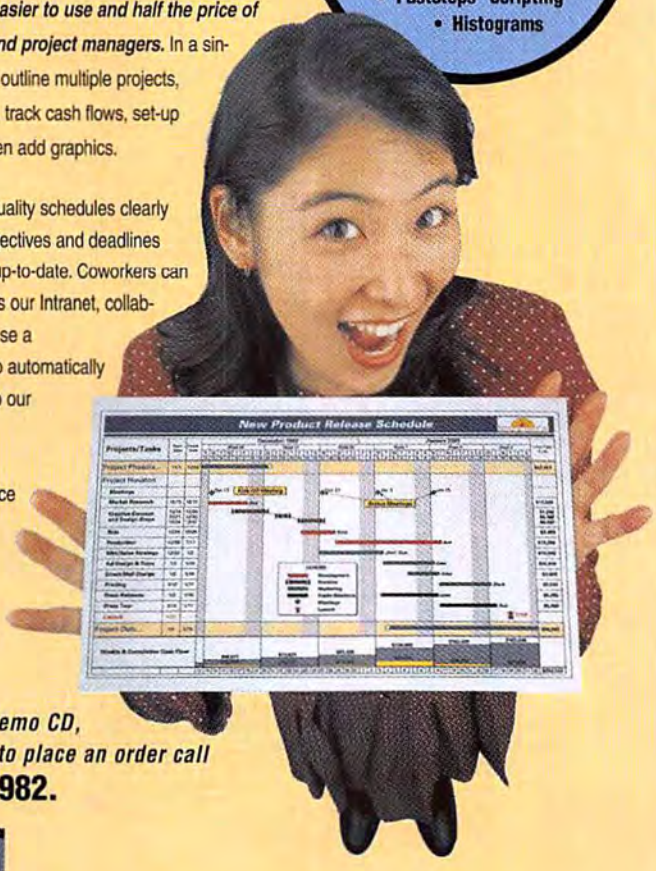

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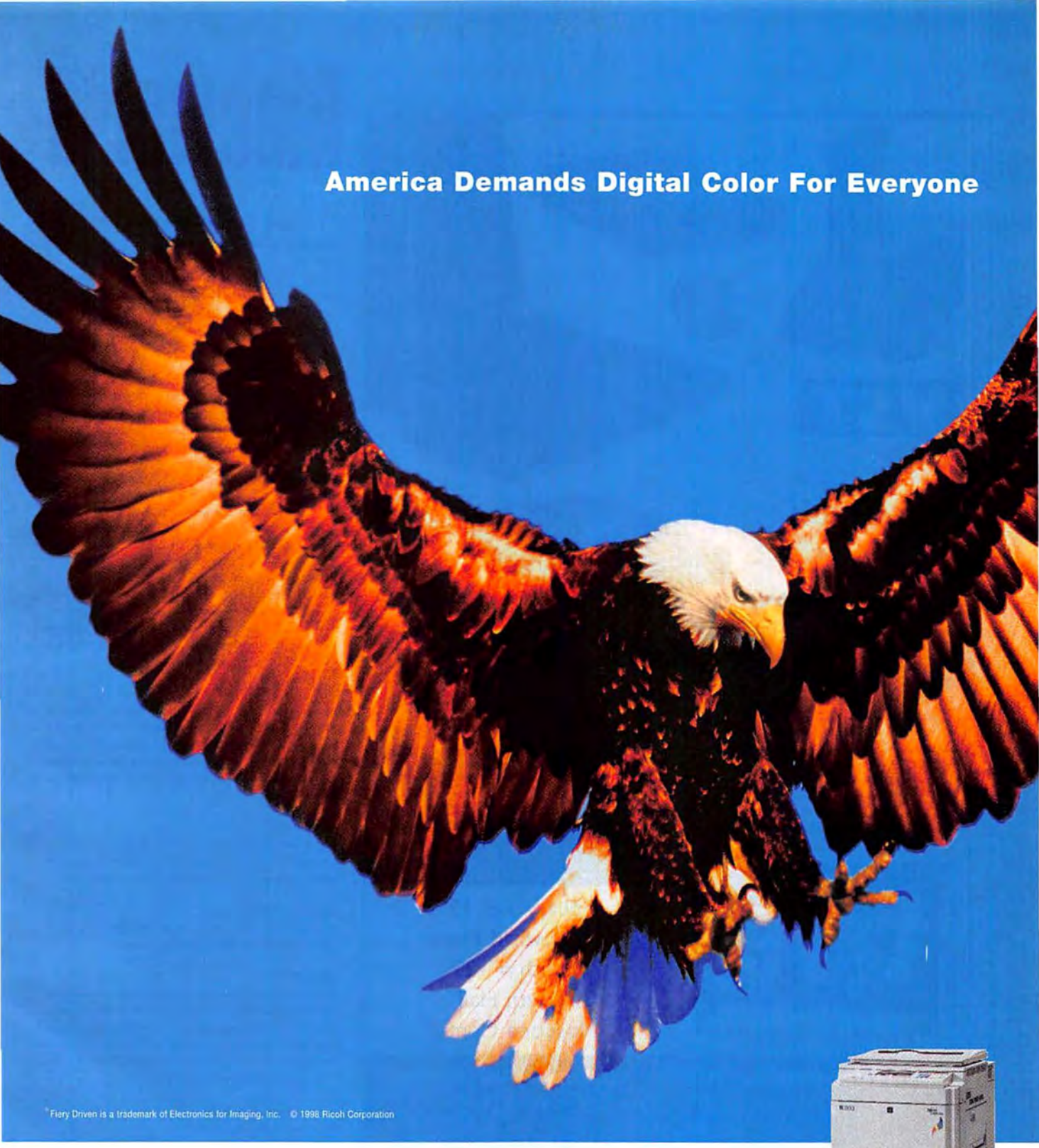

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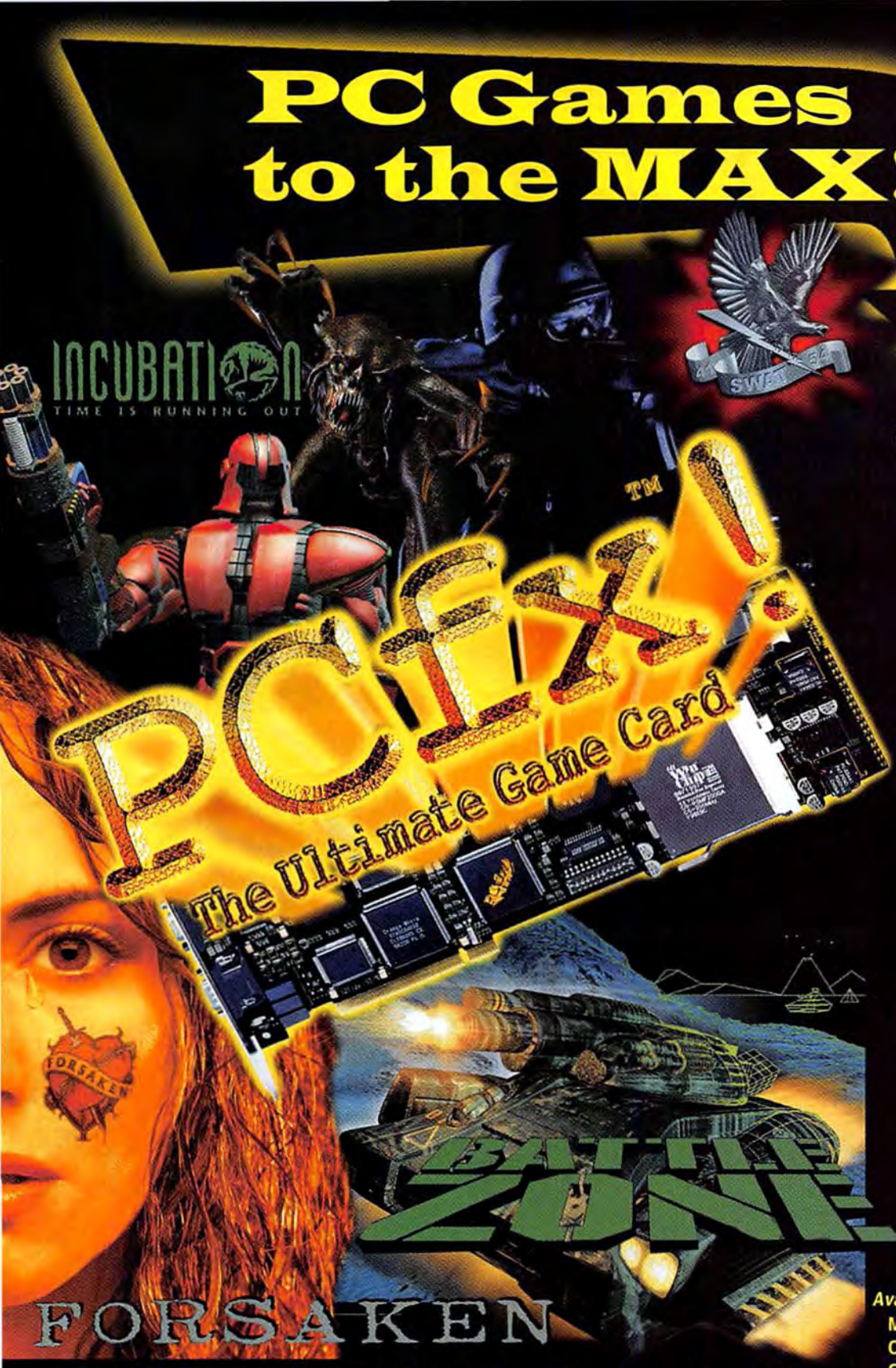

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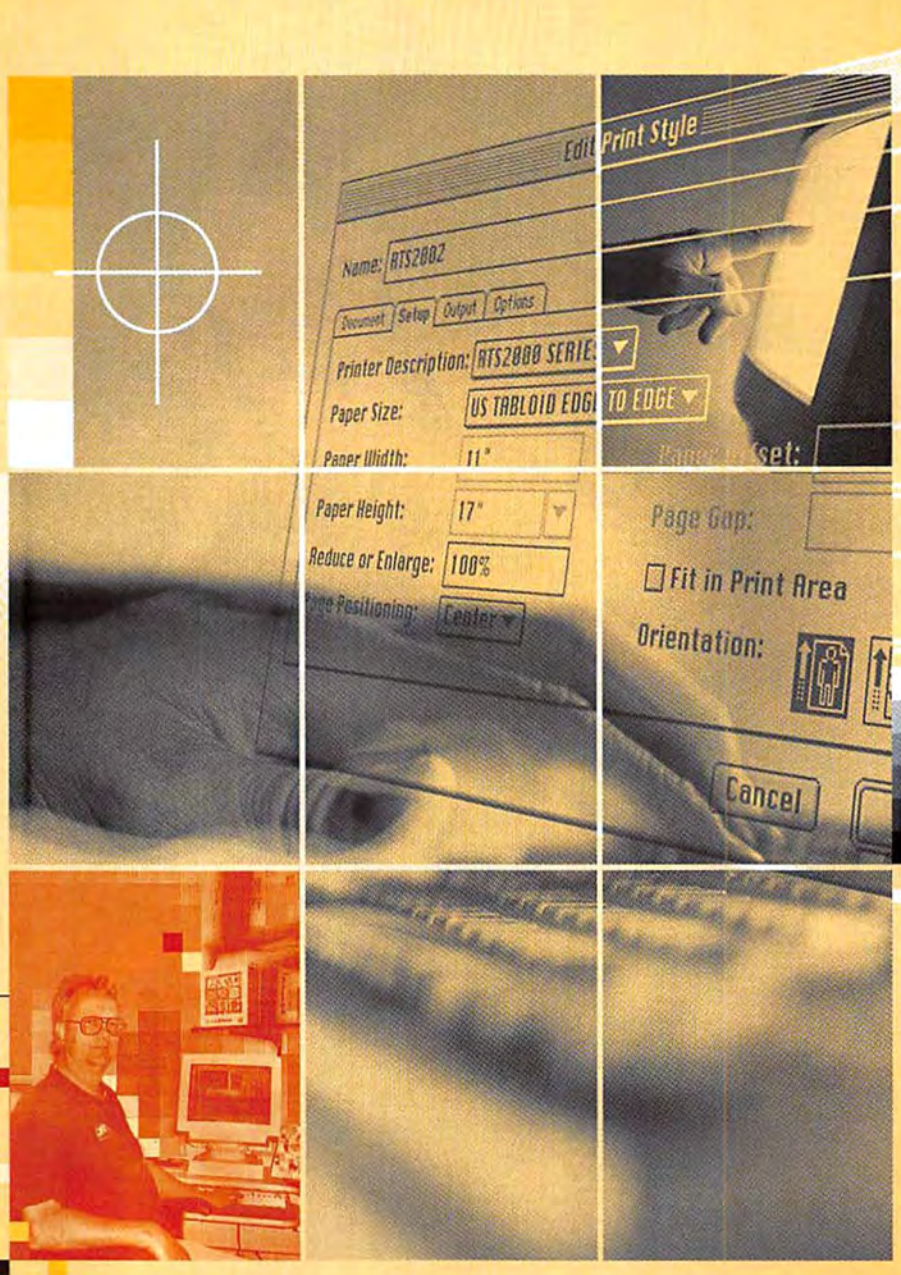

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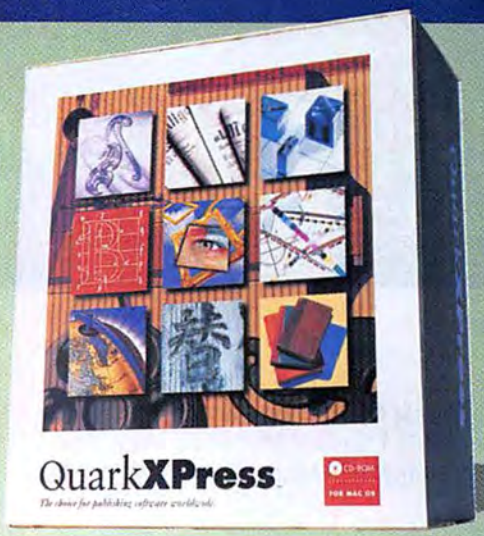

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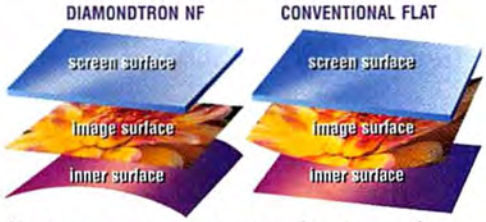

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Letters

Solving Workplace Hazards

IN HIS ARTICLE ON REPETITIVE strain injuries ("Occupational Hazards," November 1998), Dr. Franklin N. Tessler didn't mention a simple and effective strategy to prevent repetitive strain injury while greatly improving your productivity: learn to type using the Dvorak keyboard layout. Usually all you have to do is select the Dvorak layout in your keyboard control panel, and then get an inexpensive typing program that includes Dvorak, such as Typing Tutor 7 by Davidson. The standard QWERTY keyboard reminds me of Microsoft's operating system: omnipresent, painful to use, and designed to slow you down. You can learn more about Dvorak by contacting Dvorak International, at dvorakint@aol.com or www.dvorakint.org.

JIM LAURENZANO, M.D.
Longmeadow, Massachusetts

Some computer users do find the Dvorak layout less stressful and faster than the conventional QWERTY arrangement. You can download several alternative Dvorak keyboard layouts for the Mac from Apple's Web site, at www.apple.com/education/k12/disability/shareware.html.—Franklin N. Tessler, M.D.

I WAS DISAPPOINTED IN DR. TESSler's article. I'm sure his advice about avoiding wrist damage is sound. However, his advice about monitor placement, although it is what's often quoted, is incorrect for baby boomers and older people who are now wearing progressive lenses or bifocals in their glasses. These lenses are designed for looking down at close things. For all of us who wear these glasses, a monitor positioned with the top edge at eye level is certain to produce neck discomfort. For us, a monitor needs to be

recessed into the desk, preferably at a tilt, with the bottom edge of the monitor no higher than the desktop. An article dealing with recessed-monitor desks would be appreciated by our aging workforce.

HALLIE J. DAVIS, O.D.
Westminster, Maryland

As an aging baby boomer who also wears progressive lenses, I find that the middle focal zone is ideal for reading my monitor, which is positioned with its top at eye level. For those who prefer the alternative positions Dr. Davis describes, LCD panels offer far more flexibility than bulky 17-inch or larger monitors.—F.N.T.

Talking Back for the Mac

DAVID POGUE'S COLUMN "SPEECH Impediments," on the state of voice-recognition software in the Mac world, was very revealing (*The Desktop Critic*, November 1998). He tells of a software developer who would already have created a voice product for the Mac except that he was fearful Apple would undercut him. This reminds me of how Apple treated the clone manufacturers, who made a huge commitment to support the Macintosh, only to have Apple pull the rug right out from under them.

Meanwhile, Pogue says, Dragon NaturallySpeaking for the PC is selling 250,000 copies a month. I wonder how many of those buyers are people like me, longtime Mac users with a repetitive strain injury who were forced to switch platforms. That's a lot of Mac users and yet another missed opportunity for Apple.

MICHAEL BABCOCK
Oakland, California

Irksome OS 8.5

DAVID POGUE'S UNCRITICAL RAVE about Mac OS 8.5 touches on all of its admittedly fine improvements, but his article is no more critical or balanced than the average car-magazine article ("Mac OS 8.5," November 1998). The beast is a memory hog, and one simple sentence could have been added to the skimpy paper manual that would have made life so much less maddening to those of us not tethered to Ethernet backbones: "You must load Open Transport, and all of its blubber, before either Sherlock or OS Help will work."

I applaud Apple's new directions and innovations, but the rats who screw up the details are still around. Maybe Apple should thicken the "manual" by another 20 pages for those of us unwilling to surrender 25MB of RAM just to make mandatory features work.

PATRICK COLLINS
San Francisco, California

continues

JEFF NEUMANN

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I PICKED UP MY NEW COPY OF OS 8.5 yesterday, was on the brink of installing it, and read the fine print of the fine print: "Apple PC Compatibility Cards are not supported." Ouch!

I run my consulting engineering practice off my Power Mac 7200 with an Apple PC Card. I only use the PC Card for items that "industry demands"—for example, I have to issue schematics in ACad LT format. It works great. So although I do 80 percent of my work on the Mac side, I cannot get along without the 20 percent on the PC side.

I'm sure I'm not the only engineer or architect in this situation. If Apple were to update the PC Compatibility Card drivers, there would be a lot of very grateful professional Mac users. If the PC Cards are not going to run on the Mac, many of us may have to take a different fork in the platform road, against our preference. (Virtual PC isn't an option—a new Wintel machine is far more attractive if it comes to that.) How about reconsidering that support issue, Apple?

RAY NELSON
Edmonton, Alberta, Canada

Faxstf Downgrade?

I HAVE BEEN AN ADDICT OF FAXSTF (*Reviews*, November 1998) for quite a while, to the point that because of the quality of transmitted documents I persuaded my worldwide clientele to accept these faxes as solid legal documents. But that was version 3.2.5.

I am thoroughly disappointed with the new version, Faxstf Pro 5.0. The phone book doesn't automatically transfer over (what were they thinking?), and the log doesn't, either; the software doesn't facilitate ten-digit dialing; the visual quality is lower; the gray-scale quality is less clear; and the OCR utility is totally gone.

I found Faxstf to be a lifesaver several times, and now it's gone. I have since switched back to 3.2.5 and have made arrangements to return Pro 5.0, but I am waiting to see what the manufacturer is going to do—maybe get wise and fix it all with an update. I am also looking for another application that's more up-to-date and has the quality and user interface one would expect these days.

M. G. MANELIS
Littleton, Colorado

YOUR REVIEW OF FAXSTF MISSED A serious bug, maybe because your reviewer never tried sending a fax overseas. The program has a nice feature of automatically adding country codes for overseas calls when you specify the destination country. Unfortunately, the phone book loses that information, and the next time you try faxing to that destination, it thinks the destination is in the United States. Well, most of the time. Once it reset a British destination to Albania.

JEFF HECHT
Newton, Massachusetts

For Want of Good Storage

YOUR ARTICLE "GIGS TO GO" (November 1998) gives the good advice to keep a safe *backup* of the backup of magnetic media. But what about the *drive's* reliability? I've gone through five (!) 1GB Jaz drives in less than two years, and suffered the lost data, headaches, countless wasted hours, and many damaged disks caused by the drives' mechanical failures. The accommodating customer-service reps of Iomega cannot make up for a technology that doesn't work.

REINHARD SOKOL
Providence, Rhode Island

I HAVE A BONE TO PICK WITH THE focus of "Gigs to Go." Magnetic-storage technology is still in its infancy and has quite a way to go before it reaches either the speed of a real SCSI hard disk or the archival cost, reliability, and portability of CD-Recordable technology.

As you noted, CD-R costs only 0.3 cents a megabyte, plus it can be dropped ten feet without damaging the data, taped to a computer screen for a week and still retain its data, survive the winters of Siberia and the summers of the Amazon, and live in an environment as dusty as a wood mill. In addition to its durability, the CD media can be read by any PC or Mac built since 1994, without additional hardware needed for recovery or transfer of the information. I recommend CD-R to all my clients, and they all agree there is no better backup medium.

NAME WITHHELD BY REQUEST
Washington, D.C.

continues

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The Saphir Ultra 2 with *LinoColor Elite* software is the only solution that employs the same core technology that both Apple and Microsoft chose to manage color in their operating systems. This means that your scanned images will have consistent color from desktop through final output.

LinoColor Elite with *ColorAssistant* software also had the Macworld Editors saying..."*[The Saphir Ultra 2] offers unparalleled ColorSync support, three types of selective color correction and very precise control over saturation, overall color balance, and shadow and highlight gradation. If you've been thinking of bringing scanning in-house, there's never been a better time to do so...the LinoColor Saphir Ultra 2 is an exceptional value."*

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Keeping Games in Hand

IN YOUR RECENT FEATURE ON joysticks and game pads ("Take Control," November 1998), you omitted a great product, the ChoiceStick Mark V by Kernel Productions (www.kernel.com). This is an adapter that allows you to use any Sega Genesis, Atari, Sony PlayStation, Nintendo 64, or PC joystick with your Macintosh. It greatly increases the number of controller choices available to Mac game fans.

SCOTT ATWOOD
Redwood City, California

We indeed wanted to add the ChoiceStick to our roundup, but alas, it was not available to test at the time we wrote the article.—Ed.

Letters should be sent to *Letters*, Macworld, 301 Howard St., 16th Fl., San Francisco, CA 94105; via fax, 415/442-0766; or electronically, to letters@macworld.com. Include a return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*.

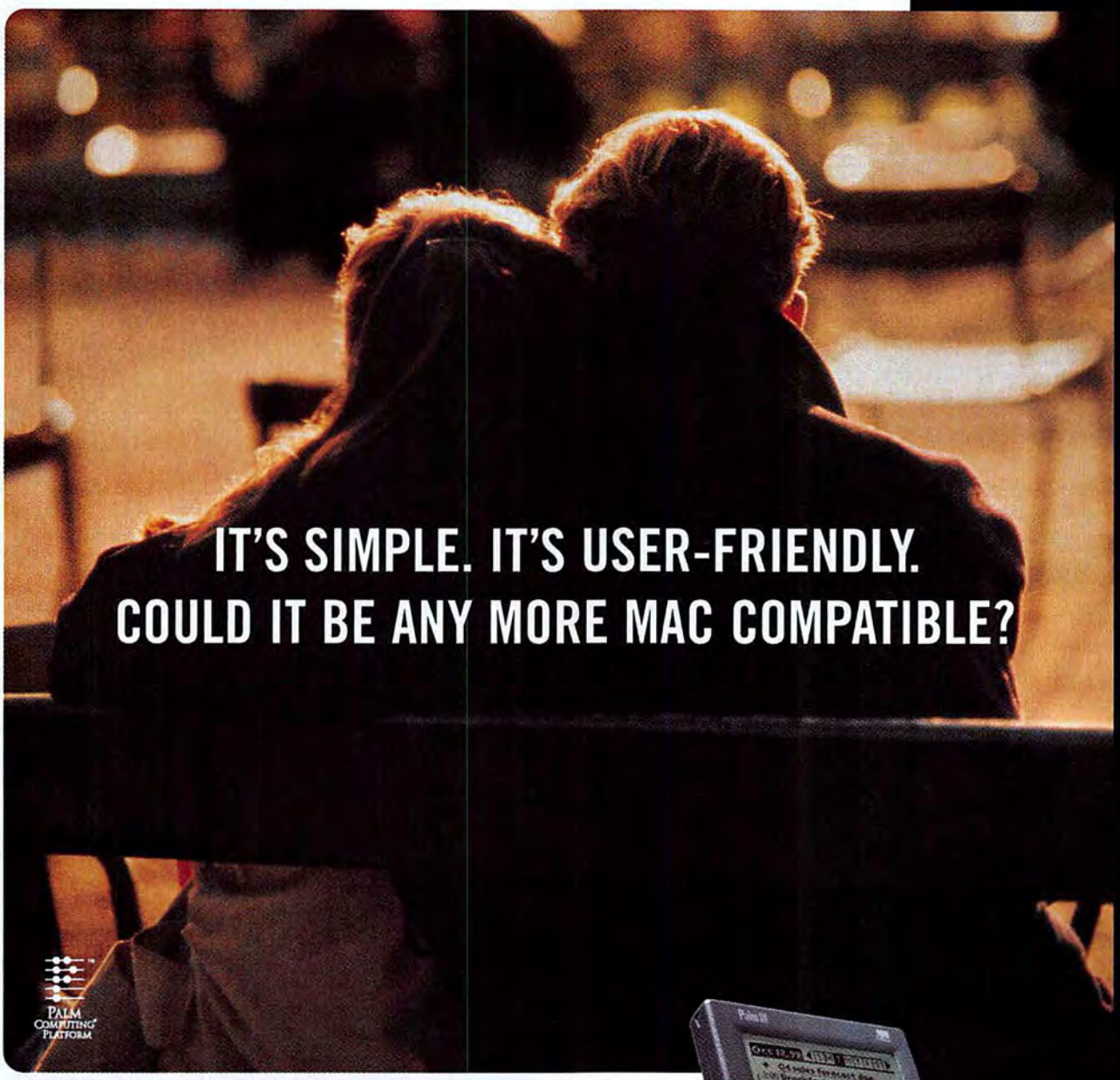
CORRECTIONS

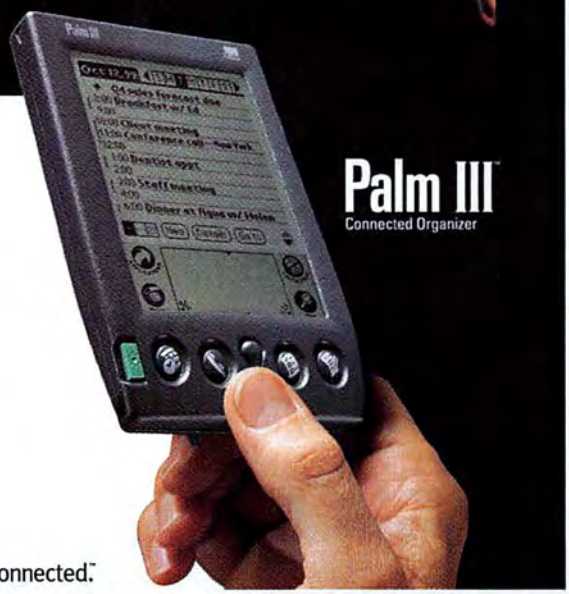
The E4 CoolDVD Mac DVD Playback Card is $279, and the CoolDVD Mac SCSI DVD-ROM Upgrade Kit is $499 ("DVD: Now Playing?" November 1998).

The iMac's video SGRAM can be expanded to 6MB (Reviews, *November 1998).*

We inadequately attributed the source images in the animation project done by Bert Monroy in "Photoshop Show-and-Tell" (Create, *November 1998). The project was based on an original Jeff Schewe image selected by Apple Computer. The following images are all copyright 1998 Jeff Schewe: sky background, stone texture background, globe, man's head, and head with globe mapped onto it.*

The Hitachi NSA PCX-DT3140 flat-panel display, which we chose as our Editors' Choice in "The World Is Flat" (December 1998), has been renamed the SuperScan LC140. The contact information is now 781/461-8300, www.hitachidisplays.com. m





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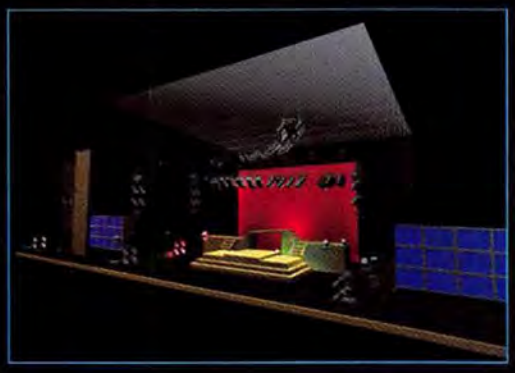

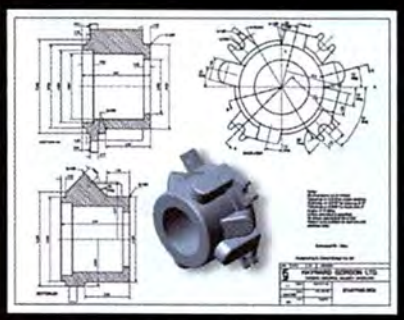

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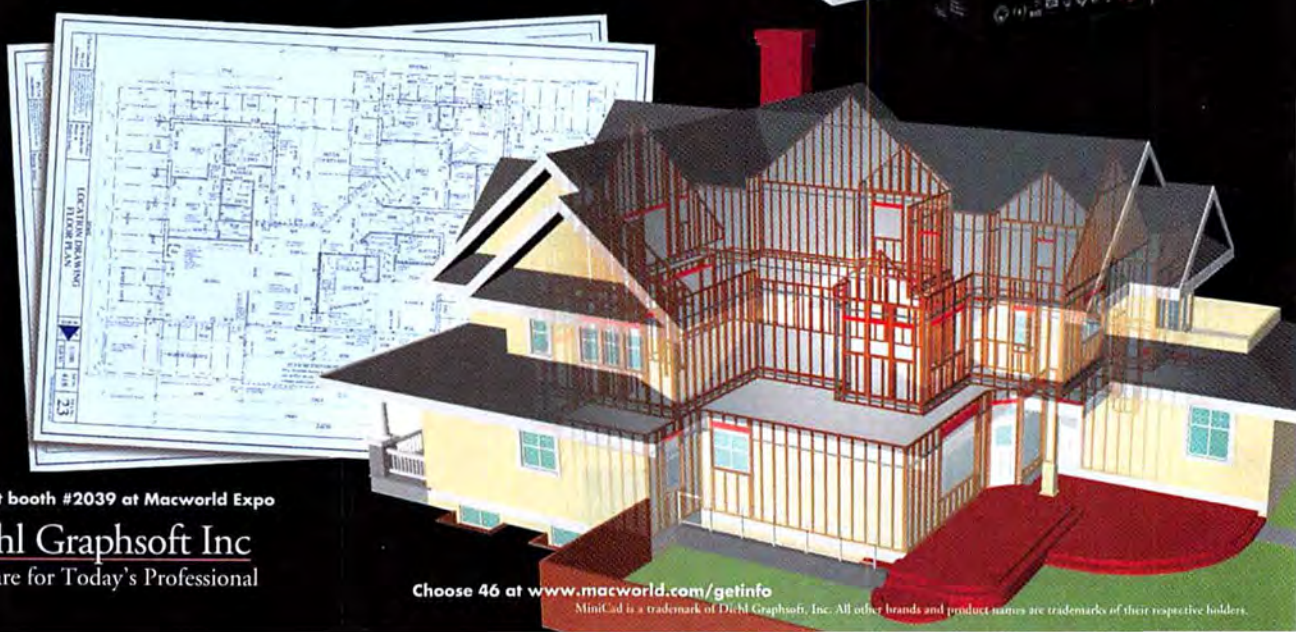

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The Vision Thing

by Andrew Gore

Let's Do the Time Warp Again

LOOKING BACK (AND FORWARD) TO THE MAC'S FUTURE

CRITICIZING SCIENCE fiction is something of a spectator sport here at *Macworld*. Many an impromptu review of the previous evening's television has been presented for the edification of fellow editors, whether they want to hear it or not. And, of course, that includes the obligatory heated argument over differences so minute you couldn't view them through an electron microscope.

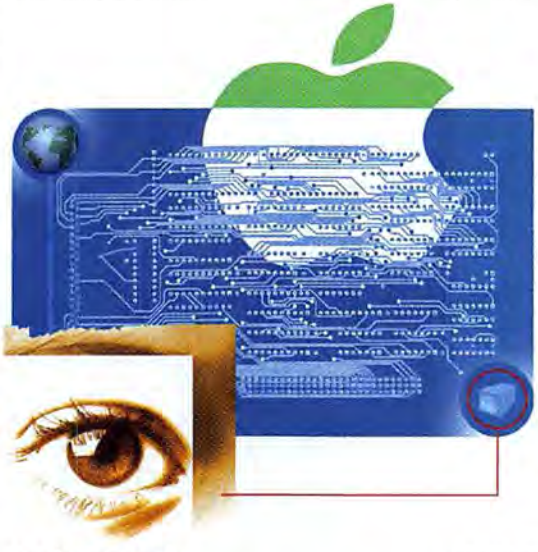
Even though I'm a die-hard *Star Trek* fan, I simply can't stomach *any* TV show—or movie, for that matter—that attempts to deal with time travel. With the possible exception of William Shatner himself, time travel has got to be the most contrived of all sci-fi contrivances.

And yet, here I am, wishing for a time machine of my very own. No, I'm not wishing I could go back to an earlier day and convince a much more callow Steve Jobs that licensing the Mac OS would be a good idea—that would be way too predictable. No, I'd travel back in time almost exactly one year to Macworld Expo '98 in San Francisco so I could give a shockingly accurate forecast of the Mac world in 1998.

Look Back

Can you imagine people's reactions when I let the iMac out of the bag, a full five months before its debut is fated to stun the world? I could take the veil off the OS named X and explain that it, not Rhapsody, will be the fuel that will power the Mac of the Future. I could also let slip that Apple will close the year with consecutive profitable quarters that will make even the most dedicated disbelievers on Wall Street bow down before its shares. Time travel: the ultimate form of insider trading!

I could predict, with unfailing accuracy, that Mac gaming will return with a vengeance as the Macintosh again becomes a player in the consumer market. I wonder what the Macintosh community of a year ago would have thought of the idea of mobs of people queuing up to buy a Macintosh as if it were a Powerball lottery ticket. Perhaps they would think me mad—there's another sci-fi cliché for you. But as the year wore on and my predictions came true, perhaps they would remember that crazy editor in chief who foresaw the stellar 12 months that was before them and would let him out of his padded basement cell. Or perhaps they'd be too busy basking in the glow of one of the most successful years in the history of the Mac platform.



JOHN RITTER

Look Forward

But wait! If I have a Wayback machine, why not just flip the switch to Wayforward and head for the first Macworld Expo of the new millennium, San Francisco, the year 2000? I can grab the last 12 months' worth of *Macworld* for some quiet reading on the ride back to 1999.

When I get here, I can write a column foretelling what the year has in store. A new line of desktop Macs won't surprise anyone—you can read about those on the Web. But maybe my prediction that Mac OS X will ship pretty close to on-time—and certainly during 1999—will raise an eyebrow or two. And just think of the facial convulsions when I prognosticate that Mac OS X will be a huge hit and will see unheard-of adoption rates for a totally new OS, as Mac users finally get to see the real power of the G3 processor unleashed by X.

I can also speak coyly of the midyear arrival of an iMac that runs on batteries. This portable for consumers will have many of the values we've come to expect of its deskbound sibling: a breakthrough design, a reasonable price, and a few surprises up its eMate-like sleeve. That the iMac will continue to be a winner seems a given, but a whole line of iMacs? It seems only logical for Apple to create consumer systems with a variety of shapes, sizes, and feature sets.

And then, of course, I'll have to issue a few somber warnings. Beware the Ides of Gates—that sort of thing. One thing I'll be sure to tell my readers is that although 1998 was a year of surprise victories, 1999 will be trench warfare for Apple. Everyone will be watching Apple, and many will be imitating the company's best moves, trying to one-up them. Expect to see a lot of Windows-based iMac knockoffs and maybe a few PowerBook clones as well. And third-party developers will continue to have their Mac loyalties tested.

Of course, all of this is just idle speculation, because, as I said at the beginning of the column, the notion of time travel is absurd. But you have to admit, that's just the kind of thing I'd be likely to say if I had indeed gotten hold of a time machine, isn't it? m

Although Andy already knows what comments you're going to make, e-mail visionthing@macworld.com anyway, so we avoid any nasty temporal paradoxes.

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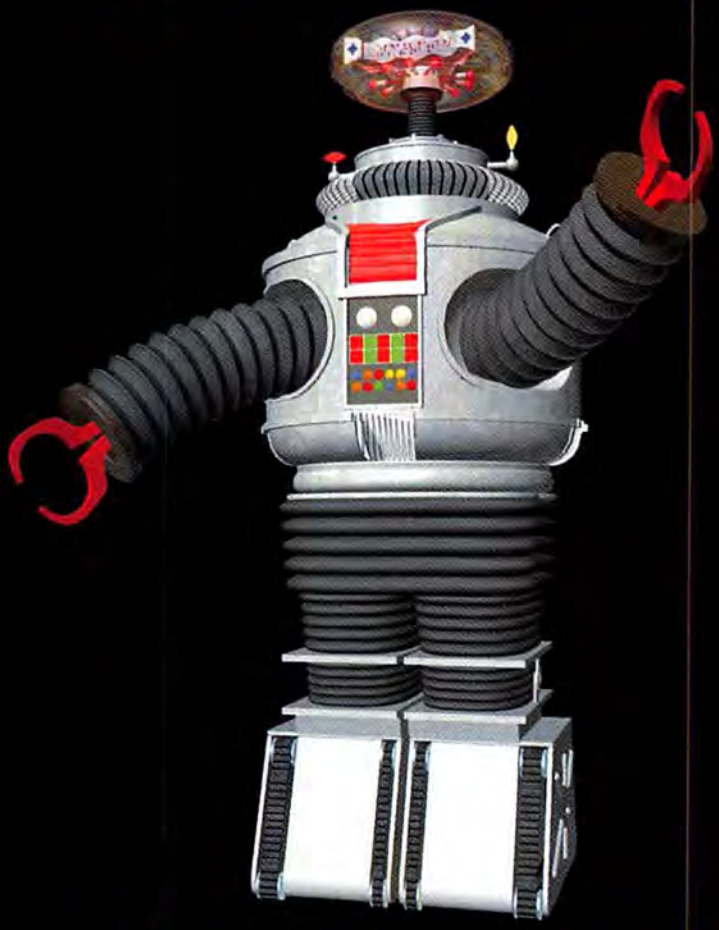

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When your Macintosh computer is not functioning properly, it is important that you have the right tool to find and correct the problem. And as any knowledgeable robot will tell you, one can never have too many tools when important data is at stake. TechTool Pro 2 checks and repairs more aspects of your Macintosh than any other utility available. Besides repairing and recovering damaged drives (including those with the new HFS+ format), you can also test all those other critical parts of your system that other utilities ignore like RAM, CPU, floppy drives, scanners, modems, Internet connections, CD-ROM drives and much, much more. TechTool Pro will even help your computer run faster by optimizing your disk drives.

But just because TechTool Pro is the most advanced Macintosh troubleshooting utility available doesn't mean that it's difficult to use. In fact, we've added an easy-to-use interface that makes checking and fixing your Macintosh a snap. For the advanced user, our expert mode allows you to control and configure TechTool Pro in almost any way you wish.

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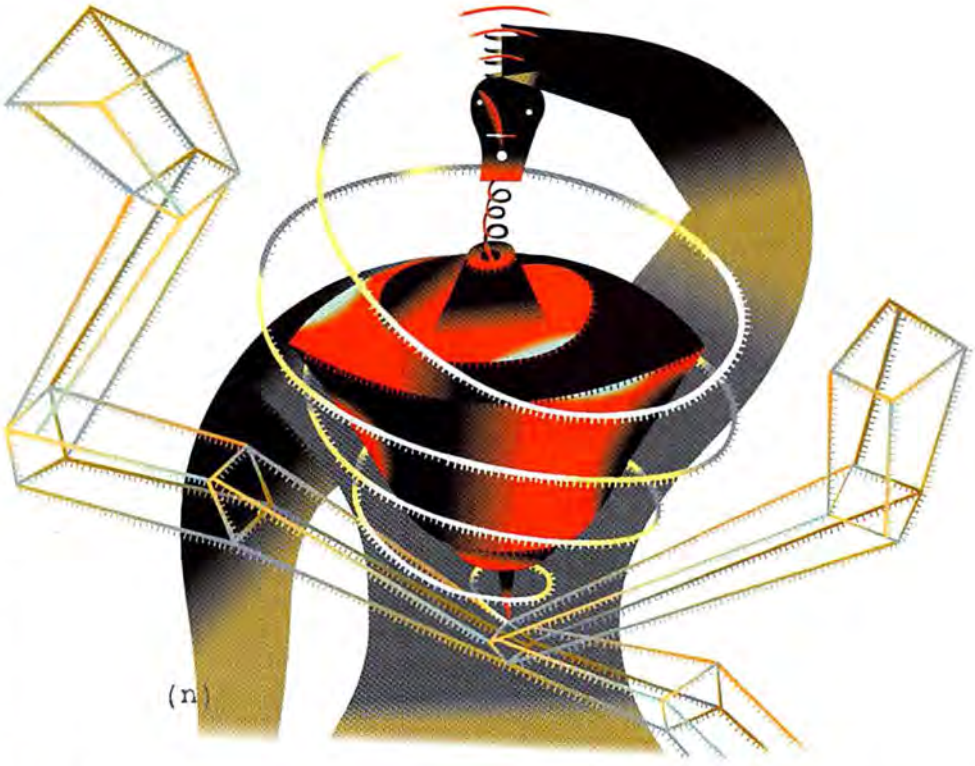
News

systems

ATI Launches Next-Generation Graphics Chip

RAGE 128 POWERS NEW LINE OF 2-D AND 3-D ACCELERATOR BOARDS

by Stephen Beale



ATI Technologies (905/882-2600, www.atitech.com), whose Rage II and Rage Pro chips drive the displays in Apple's G3 Macs, has developed a faster processor for a new generation of graphics accelerators. The Rage 128 features an internal 128-bit data path, compared with the 64-bit path in earlier Rage chips, along with other performance enhancements.

ATI plans to offer two versions of the chip, one for its own accelerator cards, and the other for system motherboards. The former features a 128-bit path to video memory, while the latter uses a 64-bit external path.

The Rage 128 is a complex piece of engineering, packing 8 million transistors, compared with about 3 million in the Rage Pro. The Rage 128 incorporates a 250MHz digital-to-analog converter (DAC), which produces the signals that drive the display. Earlier Rage chips lacked an integrated DAC, which then had to be implemented as a separate piece of silicon.

JEFF NEUMANN

Faster 3-D

The chip features several enhancements designed to accelerate 3-D–graphics performance, including 32-bit Z-buffering and single-pass multitexturing. ATI has also added support for Open GL 1.2, a set of standard 3-D–graphics routines that is gaining favor among software developers. Because the Open GL operations are encoded on the chip, software that supports the standard should run much faster on systems equipped with the Rage 128. Another new feature, four-tap filtering, offers smoother interpolation of QuickTime movies that have been enlarged from their original size.

ATI plans to use the chip in three new graphics accelerator cards: the Nexus 128, Xclaim VR 128, and Rage Orion. The company has also introduced the Xclaim 3D Plus, a $179 board—featuring the older Rage LT Pro chip—designed for use with digital flat-panel displays (see "LCD Monitors Get Bigger and Cheaper," elsewhere in this section).

The $299 Nexus 128, the successor to the $599 Nexus GA, features 32MB of memory and a maximum full-color

continues

3-D resolution of 1,920 by 1,200 pixels. The Nexus GA, by comparison, offered 8MB of RAM and a maximum 3-D resolution of 1,024 by 768 pixels. The new board also adds QuickTime acceleration, which was previously available in other ATI graphics cards but not in the Nexus GA.

The Nexus GA used an external DAC and costly Windows RAM. ATI says the performance improvements in the new chip allowed its engineers to replace the Windows RAM with less-expensive synchronous RAM.

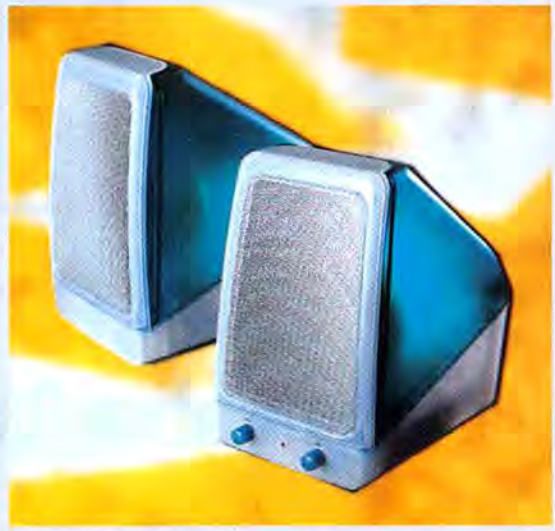
The $229 Xclaim VR 128 features 16MB of SDRAM, offering a maximum full-color 2-D resolution of 1,600 by 1,200 pixels and a maximum 3-D resolution of 1,280 by 1,024 pixels. The price includes ATI's Xclaim TV, a TV tuner that works with the board's video-in port. By comparison, the $399 Xclaim VR sported just 8MB of memory and lacked the bundled tuner.

Targeting the Voodoo

The Rage Orion board, which is targeted at Mac gamers, will compete with Micro Conversions' Game Wizard. The $229 board features 32MB of memory and a maximum full-color resolution of 1,900 by 1,280 pixels.

ATI claims that the Rage 128 offers game performance comparable to that of 3Dfx's Voodoo 2 chip, which powers the Game Wizard and numerous PC graphics boards. ATI is also positioning the Rage 128 against 3Dfx's new Voodoo Banshee chip, which offers 2-D and 3-D acceleration; the Voodoo 2 is limited to boosting 3-D game performance.

The Xclaim 3D Plus—the only new board to feature an older ATI chip—will power digital flat-panel displays as well as analog CRT or LCD monitors.



Speakers for Your iMac

TIRED OF BEIGE SPEAKERS? THE $50 COZO SYSTEM, from Uchishiba Seisakusho (www.uchishiba.co.jp/e-cozo.html), features a pair of 10-watt powered speakers with the translucent-blue iMac look. Red and amber versions are also available.—MACWORLD STAFF

multimedia

Electric Image Enters the Mainstream

VENDOR UNVEILS FIRST CONSUMER PRODUCT

by Stephen Beale

Electric Image (EI; 888/736-3371, www.electricimage.com), best known as a developer of high-end 3-D software for film and TV production, is making a big move for the mass market with a new, $149 modeling and animation program. The company, fresh from its recent merger with Play, has also announced an upgrade of its flagship ElectricImage Animation System (EIAS) that features a new modeler and a $2,295 price tag—compared with $7,495 for previous versions.

Amorphium The $149 modeling program, Amorphium, features an interface reminiscent of such MetaCreations products as Kai's SuperGoo and Bryce 3D. Instead of using wireframe models, the program presents a lump of virtual clay you can reshape using a variety of tools and filters. A potter's-wheel option lets you use the tools as the model is spinning. Simple paint-on masking tools let you confine modifications to certain parts of the object.

As you mold the model, you can paint directly on its surface or apply textures. You can also use textures to deform the surface. Once you've finished the model, the program lets you create simple QuickTime animations in a Composer window. You can animate an object's movement and shape transformations, but you cannot animate multiple objects in a single movie—though movies can include any number of still 3-D objects. Backgrounds and smoke and fog effects can also be added. The program's speedy rendering engine is based on the one in EIAS.

In addition to creating models within the program, you can also import and export them in DXF or other 3-D formats. However, the program does not support Apple's 3Dmf format.

The New EI Electric Image has also announced version 2.9 of EIAS, its high-end rendering and animation program. The upgrade is the first to include Electric Image's new modeler; previous versions required artists to use modelers from other companies. EIAS 2.9 also lets you preview texture maps, another much requested feature. But the biggest news about the upgrade may be its price. Previously, Electric Image offered two versions of EIAS, a $2,995 broadcast edition and a $7,495 film version. With EIAS 2.9, the company will offer a single $2,295 package that incorporates both editions plus the modeler. EI also plans to offer

Amorphium, new from Electric Image, lets you create models from lumps of virtual clay.

SUZANNE ROADY

a five-pack education bundle for $900.

In April 1998, EI announced its merger with Play, a developer of PC-based 3-D–graphics products. EI, now a division of Play, will use the latter's distribution channels to sell the new software.

multimedia

New Tools for Multimedia Developers

DIRECTOR 7 UNVEILED AS A NEW RIVAL EMERGES

by Stephen Beale

When Quark pulled the plug on its Mtropolis software last March, Macromedia Director—already the dominant multimedia-authoring package—had the market pretty much to itself. Now, as Macromedia (415/252-2000, www.macromedia.com) releases Director 7, the program faces a potential new rival from a company cofounded by two former Apple executives. That company, Tribeworks (415/732-7004, www.tribeworks.com), has developed an authoring program called iShell that lets producers create complex multimedia presentations using a visual interface.

Director on the Web Director 7 continues Macromedia's strategy of positioning its applications as Web production tools. The upgrade incorporates Shockwave 7, a new version of Macromedia's Web-based multimedia format that improves streaming capabilities and automatically updates the Shockwave players on client machines. The upgrade also lets you export vector animations in the Flash 3 format, which now supports transparency. New HTML features let you create Web pages that trigger multimedia actions, such as animating a headline, when the user clicks on a hyperlink.

The upgrade also features enhancements to the Lingo scripting language, along with new onion-skinning and alpha-channel functions.

Director 7 is offered as part of the $999 Director 7 Shockwave Internet Studio, which also includes Fireworks for Web-graphics production and Bias Peak LE for sound editing.

Out of Its Shell Tribeworks is a new company cofounded by Patrick Soquet, developer of Apple Media Tool, and Duncan Kennedy, formerly the QuickTime product marketing manager for Apple. The vendor's iShell is a software suite consisting of iShell Editor, the main authoring tool; iShell Runtime, which permits playback of iShell presentations; and a software developer's kit, which lets you create iShell plug-ins. You can deploy iShell presentations on the Web, but the company expects that users will employ the software primarily to produce CD-ROMs and electronic kiosks.

The software's visual interface uses *containers* to store media elements. You can assign behaviors to a container by dragging them from a list. Presentations created with the program can retrieve media elements from local storage devices, either through a local-area network or over the Internet.

The company has chosen an unusual strategy for marketing the software. Instead of offering iShell as a product, Tribeworks is selling $2,000 annual subscriptions that include upgrades, technical assistance, and marketing support.

systems

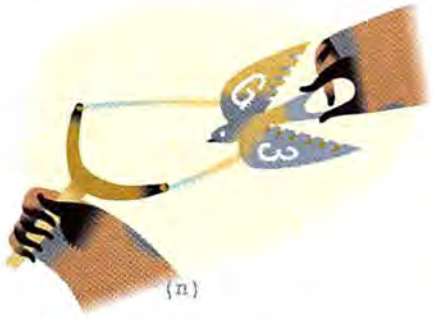
G3 Upgrades for G3 Macs

FAST NEW PROCESSOR UPGRADES ACCELERATE EARLY G3 MODELS

by Allyson Bates

Everyone wants more speed, even owners of early G3 Power Macs. A new batch of processor-upgrade cards promises performance boosts for G3's running at 233MHz, 266MHz, 300MHz, 333MHz, and 366MHz.

PowerJolt OverDrive upgrade cards, from Mactell (512/323-6000, www.mactell.com), are available in 300MHz, 333MHz, 366MHz, and 400MHz versions with several cache options. Prices range from $795 to $1,595.



The Maxpowr line of CPU upgrades, from Newer Technology (316/943-0222, www.newertech.com), now includes 333MHz, 366MHz, and 400MHz cards for G3 Power Macs. Newer also plans to offer, by the time you read this, CPU upgrades for older

continues

JEFF NEUMANN

Product WATCH

It's Back! Kai's Power Tools, which launched a revolution in Adobe Photoshop plug-ins, is back. **Kai's Power Tools 5,** $199 from MetaCreations (805/566-6200, www.metacreations.com), lets you create a wide range of special effects from within Photoshop. You can use KPT FiberOptix to create furry text or shag carpet; KPT Blurrrr for zoom, spin, and blur effects; and KPT FraxPlorer for new fractal styles. You can also create objects with reflective glass edges or explode an image into thousands of spheres.

Optimal HTML **BBEdit 5.0,** the latest edition of Bare Bones Software's (781/687-0700, www.barebones.com) text and HTML editor, features a more accurate HTML syntax checker, along with Tag Maker and Edit Tag commands that prevent you from inserting incorrect code. The $119 program (upgrade, $39) also strips white space and unneeded text from HTML code and includes an SGML parser that lets you write and validate XML tags.

That's the Stuff Are garbled e-mail attachments ruining your productivity? **StuffIt Deluxe 5.0,** Aladdin Systems' (831/761-6200, www.aladdinsys.com) upgrade to its $79.95 compression software, adds Microsoft Outlook Express and Bare Bones' Mailsmith to the e-mail programs it supports. The upgrade also offers better compression and smoother cross-platform file exchanges than before.

continues

Product WATCH

Photoshop Fix Adobe Systems (408/536-6000, www.adobe.com) has released a free update to Adobe Photoshop that addresses two major complaints: color management and text kerning. **Photoshop 5.0.2,** available from Adobe's Web site, changes the working color-space default from sRGB to None. (Previously, Photoshop 5.0's default settings converted images to sRGB when you opened them.) A new Color Management Assistant helps you set color preferences when you first launch the update. The update also fixes kerning and tracking problems in version 5.0's Text tool.

Get the Edge MagicMask 2.0, an upgrade to the $99.95 Adobe Photoshop plug-in from Chroma Graphics (650/685-6800, www.chromagraphics.com), now lets you convert masks and selections into straight-line clipping paths for easier printing. The new version also offers presets for common color-range masking and blue-screen knockouts and gives added control over color settings.

SyQuest Closes Its Doors SyQuest Technology, maker of the SyJet and SparQ removable-media devices, has shut down and filed for bankruptcy due to low sales and share value. The move followed major layoffs in August 1998. The 16-year-old company's 44MB and 88MB cartridges once represented the standard for removable storage in the Mac market.—EDITED BY MICHAEL GOWAN

Power Macs, including the 7000, 8000, and 9000 series, and for models from popular clone vendors, including Power Computing, Motorola, and APS Technologies.

PowerLogix (512/795-2978, www.powerlogix.com) offers 333MHz, 366MHz, and 400MHz upgrade cards with various cache speeds. Their prices range from $1,099 to $1,599. Sonnet Technologies (949/261-2800, www.sonnettech.com) has announced three upgrade cards in its Crescendo G3 series, also running at 333MHz, 366MHz, and 400MHz. Prices begin at $1,099.

XLR8 (316/636-5544, www.xlr8.com) is offering a 400MHz, $1,899 version of its Mach Speed G3 CPU upgrade card for Power Macs. The company says the card will work in the Power Mac 7300, 7500, 8500, 8600, 9500, and 9600, as well as most Power Computing models and Umax Computer's SuperMac S900 and J700 lines. XLR8 also offers a 333MHz version and intends to have a 366MHz version by the time you read this.

Flat Is Fabulous

LCD MONITORS MAY BE GETTING ALL THE ATTENTION, but there's still plenty of life left in the trusty old CRT. The 19-inch Diamond Pro 900u, from Mitsubishi (714/220-2500, www.mitsubishi-display.com), features a distortion-free flat screen, thanks to the company's Natural Flat technology, which compensates for the concave effect found in other flat-screen CRTs. The $799 monitor, with an 18-inch viewable area, has a maximum resolution of 1,600 by 1,200 pixels and includes a four-port USB hub.—MICHAEL GOWAN

display

LCD Monitors Get Bigger and Cheaper

VIEWSONIC, PRINCETON UNVEIL 18-INCH MODELS

by Michael Gowan

The future of LCD monitors—bigger screens, better images, and lower prices—is fast becoming a reality. Among the newest models, the 18.1-inch DPP 800, from Princeton Graphic Systems (714/751-8405, www.prgr.com), features an all-digital interface, while the 18.1-inch VG180, from ViewSonic (909/869-7976, www.viewsonic.com), sports an under-$2,800 street price.

Princeton Goes Digital Princeton's $3,499, 18.1-inch DPP 800, scheduled to ship in January, 1999, offers 1,280-by-1,024-pixel resolution and includes a USB hub. It joins two new 15-inch LCD monitors from Princeton, the $1,039 DPP 550 and the $1,099 DPP 560, which are scheduled to ship by the time you read this. Both 15-inch models offer 1,024-by-768-pixel resolution; the DPP 560 can pivot to portrait or landscape mode.

All three Princeton displays use Digital Flat Panel technology—which does not require the analog-to-digital converters found in other LCD monitors—for improved image clarity. The displays come with ATI's Xclaim 3D Plus graphics cards (see "ATI Launches Next-Generation Graphics Chip," elsewhere in this section). The monitors won't work with your Mac's built-in video.

ViewSonic Goes Big The 18.1-inch VG180, from ViewSonic, lacks Princeton's digital interface but sells for a street price of $2,795. The monitor offers a maximum resolution of 1,280 by 1,024 pixels. The price does not include a graphics card, but the display will work with your Mac's built-in video.

ViewSonic product manager Mark Gersh says the VG180 is the first in a family of large-screen LCD monitors ViewSonic plans to offer.

GIBSON

Show this to the salesguy who tries to sell you a new printer with your USB Mac

Just because you bought a new USB Mac doesn't mean you have to buy a new printer. If you already have a PC–printer, you can easily connect it using PowerPrint USB–to–Parallel. With PowerPrint, your USB Mac can print to over 1500 PC–compatible inkjet, laser, and specialty printers.

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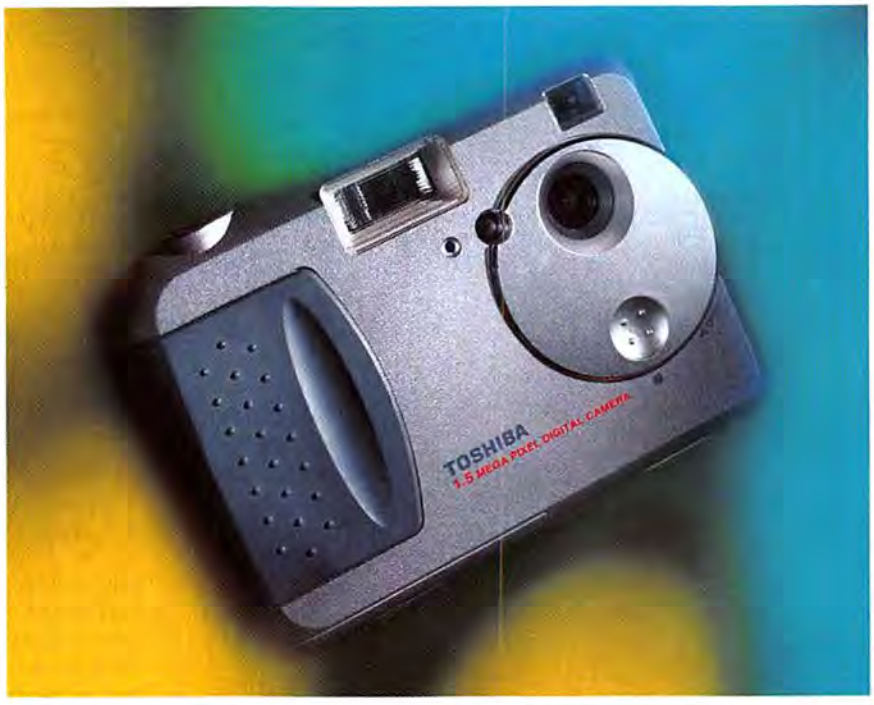
INFOWAVE

Reviews

Megapixel Cameras

SIX NEW CAMERAS EACH CAPTURE 1.3 MILLION PIXELS OR MORE



SUZANNE ROADY

COMPETITION IN THE DIGITAL-camera market is heating to a boil. While companies such as Kodak, Nikon, and Olympus focus on quality and innovation, others are more interested in simply meeting a demand. This may explain why Toshiba, Ricoh, and Casio—hardly big names in camera circles—are the first to offer megapixel devices for less than $500.

But for $499, you shouldn't expect impeccable image quality. Of the three, the Toshiba PDR-M1 fares best. Like Fuji's $799 MX-700—which relies on the same CCD, lens, and internal hardware—the PDR-M1 captures fine details that hold up well to Adobe Photoshop's Unsharp Mask. The downside is that the colors often appear faded, with a yellow cast. The softer images from Ricoh's RDC-4200 tend to drift toward blue, with exaggerated contrast between light and dark. The Ricoh camera also has problems with blown highlights, so that sunny skies almost always turn white. The worst photos come from the Casio QV-5000SX. The blurry focus, gummy edges, and severe purple cast of its images challenge the skills of even the most accomplished imaging technicians.

One step up from the PDR-M1 is Agfa's ePhoto 1680. Although the company states that the camera has resolutions of up to 1,600 by 1,200 pixels—nearly 2 million in all—this is a function of software interpolation. The 1680's CCD is actually the same size as those in the Casio and Ricoh models, and it likewise captures 1,280 by 960 pixels. Fortunately, the detail is just as crisp as with the Toshiba and Fuji models. The colors tend to be a bit understated, but without the yellow cast. The bad news is the $899 asking price, nearly twice that of the Toshiba PDR-M1.

Kodak's $999 DC260, even in diffused or overcast lighting, delivers vivid, accurate colors with rich sculptural details (see "A Cast of Colors"). And unlike the Agfa, it *earns* its higher price by supplying more pixels than any other camera in the roundup.

Storage and Connectivity

Most of these cameras store images on wafer-thin SmartMedia cards. The Fuji and Toshiba models are the most flexible, accepting 3.3V and older 5V cards; the Agfa and Ricoh accept the 3.3V variety only. But whereas the Agfa, Ricoh, and Toshiba models ship with 4MB cards, the Fuji includes only a skimpy 2MB card.

REAL PRODUCTS REAL RATINGS
Reviews you can trust: Macworld rates only final shipping products, not prototypes. What we review is what you can actually buy.
OUTSTANDING: ♦♦♦♦♦ VERY GOOD: ♦♦♦♦ GOOD: ♦♦♦ FLAWED: ♦♦ UNACCEPTABLE: ♦

Kodak's DC260 uses a removable 8MB CompactFlash card, thicker than the SmartMedia but more resilient as well. The Casio QV-5000SX features 8MB of hardwired memory.

These days, removable storage also translates to faster downloading. If your computer includes a PC Card reader—as most PowerBooks do—you can purchase a SmartMedia or CompactFlash adapter for about $100. You remove the card from the camera, stick it in the adapter, and slide the adapter into the computer's PC Card slot. Copying 8MB of images takes about 10 seconds; erase the card and you're ready for more. By contrast, your only option with the Casio is to connect it to your Mac's sluggish serial port and wait about 20 minutes to copy 8MB of images—and that's when the gods are smiling. More often, Casio's transfer utility has problems finding the camera—this happened every time we tried to download images.

In an about-face, the DC260 is the only camera we've used that cannot shuttle images directly to the Mac, by serial cable or otherwise. Kodak forces you to use a PC Card adapter, which you must purchase separately. If you don't have one, your only option is to cable the DC260 to a PC. Kodak is currently beta-testing software that permits iMac owners to download images via a USB cable.

Batteries, Zoom, and Other Finery

The Agfa, Kodak, and Ricoh models provide continuous 3× optical zooms so you can close in on your subject. (The others offer fake "digital" zooms, which merely enlarge pixels.) The Kodak DC260 lets you preview the zoom via either an optical or an LCD viewfinder; the ePhoto 1680 and RDC-4200 lack optical viewfinders and force you to use the power-hungry LCD. Thankfully, Agfa bundles rechargeable batteries to feed the LCD and provides an enhanced night view for shooting in low light; Ricoh does neither.

If bells and whistles appeal to you, the DC260 is too sexy for its lens cap. It's the only under-$1,000 model we've seen that permits timed exposures (up to 4 seconds), time-lapse photography, and user-defined scripts.

A Cast of Colors When shooting under cloud cover, the cameras reveal their casts, from slightly yellow (the Fuji and Toshiba models), to distinctly blue (Ricoh), to as purple as an overripe grape (Casio). The Agfa captures fairly accurate but drab colors. Only the Kodak DC260 delivers the scene in all its glory, with obvious color distinction between building and sky.

Macworld's Buying Advice

Now that Agfa has remedied the software problems that plagued the ePhoto 1280, the 1680's simple controls, above-average image quality, and optical zoom make it an attractive camera. But if the $899 price scares you away, get Toshiba's PDR-M1. For $400 less than you pay for the Agfa, you sacrifice zoom and rechargeable batteries but gain a few thousand pixels.

For imaging professionals, Kodak's DC260 deserves a long look. Its superb photographs and wide range of controls will satisfy you for years to come. But it suffers from odd flaws. You have to wait several seconds for the DC260 to turn on or off (despite a recent firmware upgrade), and it has difficulty tracking the number of images left to shoot. And in the random-contradictions department, the DC260 is the only camera so far that's compatible with the iMac, making it a high-end device for a low-end market.

If we had to recommend just one under-$1,000 camera, it would continue to be the ★★★★½ Olympus D-600L (see "Focus On," October 1998), which has a unique SLR viewfinder and first-rate image quality, even if it does capture fewer pixels than the DC260. But for those whose main concern is image quality—and who have a PowerBook and a PC Card reader—the DC260 is a serious contender, clearly one of the very best.—DEKE McCLELLAND

Digital Cameras: More Pixels for the Money

Company	Agfa	Casio	Fuji	Kodak	Ricoh	Toshiba
Product	ePhoto 1680	QV-5000SX	MX-700	DC260	RDC-4200	PDR-M1
Mouse rating	★★★½	★★	★★★	★★★★	★★★	★★★½
Price	$899	$499	$799	$999	$499	$499
Phone	978/658-5600	973/361-5400	914/789-8100	716/724-4000	702/352-1600	949/461-4970
Web address	www.agfahome.com	www.casio.com	www.fujifilm.com	www.kodak.com	www.ricohcpg.com	www.toshiba.com
CCD resolution (in pixels)	1.3 million	1.3 million	1.5 million	1.6 million	1.3 million	1.5 million
Maximum image size (in pixels)	1,280 × 960	1,280 × 960	1,280 × 1,024	1,536 × 1,024	1,280 × 960	1,280 × 1,024
Default memory	4MB	8MB	2MB	8MB	4MB	4MB
Storage capacity (in images) at maximum image size	6 to 12	16 to 57	2 to 11	14 to 32	6 to 23	5 to 22
Optical-zoom function	yes (3×)	no	no	yes (3×)	yes (3×)	no
Optical viewfinder	no	yes	yes	yes	no	yes
Rechargeable batteries with charger	yes	no	yes	no	no	no

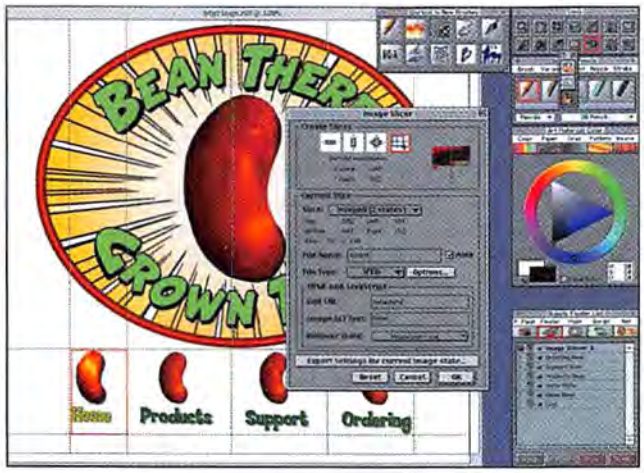
Painter 5.5 Web Edition

NATURAL-MEDIA PAINTING TOOL GETS NEW WEB DESIGN FEATURES

DON'T BE CONFUSED BY THE name. There is no "non-Web edition" of MetaCreations Painter 5.5 Web Edition. Instead, this is an upgrade to MetaCreations Painter 5.0, the popular natural-media painting program. Though most of the upgrade's new features are Web specific, longtime users will be glad to see a new editable text function and support for Adobe Photoshop 5's layers complementing Painter's existing array of painting tools.

It Slices! It Dices! It Juliennes!

Painter 5.5 sports the same interface as version 5, a somewhat palette-heavy, complicated affair that more or less succeeds in organizing the program's many tools and variants. Painter also makes extensive use of *floaters*, similar to layers in Photoshop. However, unlike Photoshop layers, floaters can be different sizes and can function as plug-in utilities as well as image repositories.



Slice That Button The Image Slicer floater in Painter 5.5 Web Edition lets you create JavaScript rollover effects.

Painter's tool set is both a strength and a weakness. No other product comes close to offering the sophistication and power of Painter's brushes and tools, but the sheer number of options makes this a program that can take a while to learn. Still, the results are worth the effort.

Painter 5.5 adds a new Image Slicer plug-in floater that performs automatic slicing on any document. Web slicing chops a graphic into segments you can reassemble in an HTML table. Slicing typically makes images download faster, particularly if only one slice is changing from page to page.

You define slices in the Image Slicer floater by placing and dragging horizontal and vertical rules over your image. In addition to specifying file names and URLs for each slice, you can also define separate compression settings, allowing you to choose the best compression options for individual segments.

When you export a sliced image, Painter automatically creates a separate document for each slice, as well as an HTML file that reassembles the images into a table.

Because slicing is implemented as a plug-in floater, you don't have to flatten your image, so you can slice while preserving all of your separate layers. However, we'd like to see a preview window that shows the effects of different compression settings.

Rollovers

The Image Slicer also lets you create JavaScript rollover effects in which buttons appear in different states depending on mouse actions (see "Slice That Button"). You generate rollovers by creating floaters for each button state and then slicing your image so that each button goes on its own slice. Once this is done, you can modify each floater to create the look you want for a particular state. When you're finished, you export the JavaScript code needed to create the rollover effects; you must export each button state separately.

This method feels a bit clunky, but it works and it forces you to keep your document organized into layers with different buttons and states, making it easy to edit your work later.

Dynamic Text

Because Web pages are constantly updated, MetaCreations has added a Dynamic Text tool, a plug-in floater that lets you add editable text to your Painter documents. You enter text in a dialog box instead of typing directly in your image, but the program updates the image in real time, letting you see the effects of font, color, tracking, translation, and leading controls. The plug-in also lets you fill text with a pattern and add automatic, editable drop shadows.

Painter 5.5 can now automatically create server- and client-side image maps based on URLs attached to each floater. You can also preserve layering in imported Photoshop files, but the program cannot export layered Photoshop files.

MetaCreations is touting several other Web features in Painter 5.5 that are actually holdovers from previous versions. For example, the Bevel World feature is great for making buttons, and seamless texturing is useful for creating backgrounds.

Macworld's Buying Advice

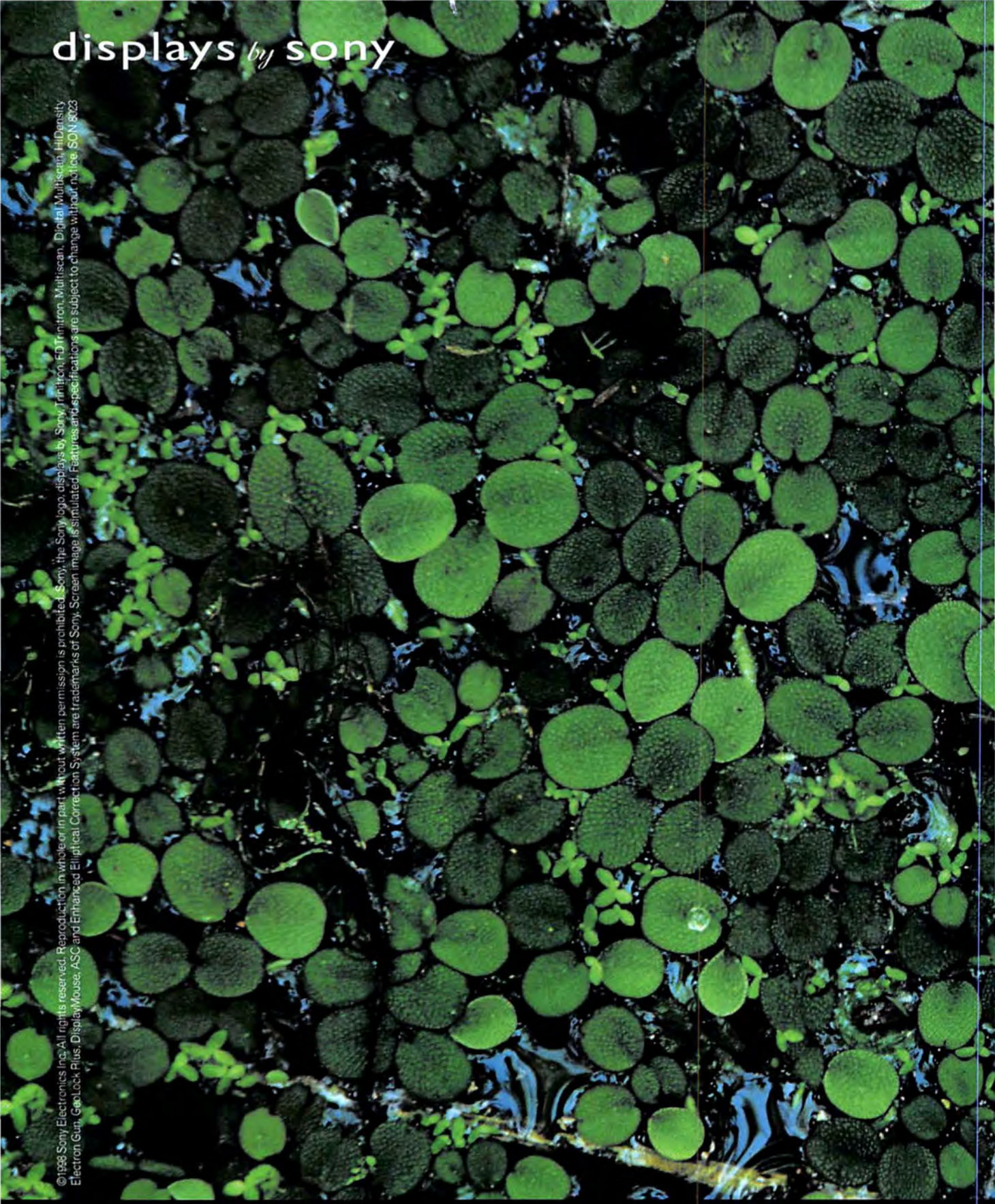
Except for editable text, Painter 5.5 provides no new painting or image-editing tools. It's nice to have the new Web features built into the program, particularly since they let you preserve your image's layering. However, serious Web designers probably already have tools for performing these tasks.

If you do Web design and spend much time in Painter, these additions are worth the upgrade price. Other users might want to wait for an upgrade with more new painting features. Whatever you use it for, Painter 5.5 Web Edition's unique tool set makes the program an impressive, powerful image-creation utility.—BEN LONG

RATING: ♦♦♦♦ **PROS:** Image slicing lets you preserve layering; separate compression for each slice; strong painting tools; editable text. **CONS:** No new painting tools; interface still complicated. **COMPANY:** MetaCreations (805/566-6200, www.metacreations.com). **LIST PRICE:** $299 (upgrade from Painter 5, $79; from Painter 4, $129).

Fool God.

displays *by* sony



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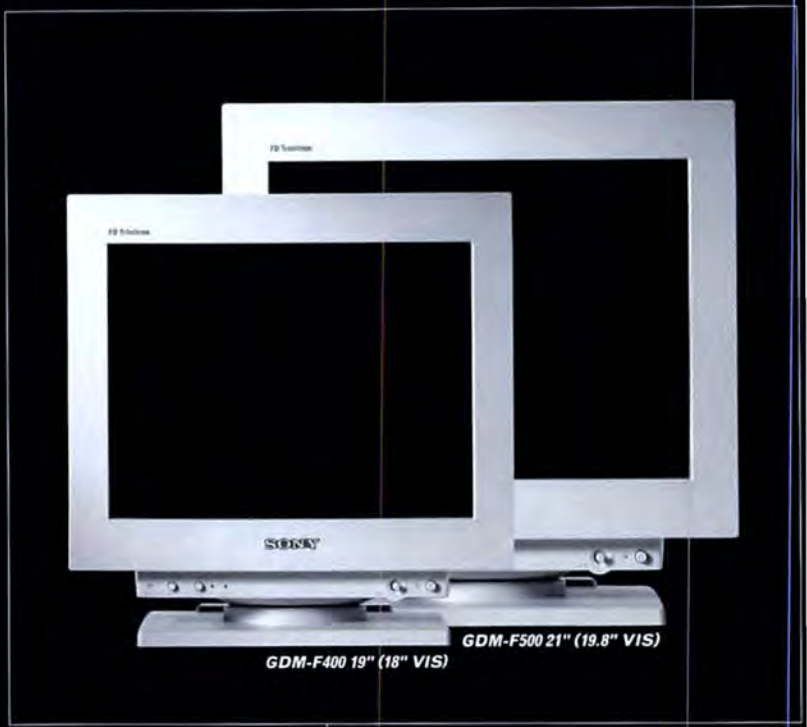

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FD Trinitron

Windows 98 Emulators

STILL A SLUGGISH PROPOSITION

LIKE IT OR NOT, BECAUSE MUCH of the software that's available for the PC lacks a Mac counterpart, you occasionally need to turn to Windows applications to get your work done. But depending on the application, you may be able to use a software emulator running on your Mac rather than having to use an actual PC.

Unfortunately, our lab testing made one thing abundantly clear: if you need to run resource-intensive Windows software, emulators aren't for you (see "Emulation in the Slow Lane"). On a Power Macintosh G3/300, Connectix's Virtual PC 2.1.1 and Insignia Solutions' SoftWindows 98 5.0.4 delivered less than one-fifth the performance of our baseline system, a 300MHz Intel Celeron–based PC. That said, both emulators are fast enough and compatible enough for quick forays into the Windows world.

Alike, Yet Different

Virtual PC and SoftWindows 98 are philosophically identical: they re-create a PC—including its CPU (an MMX-equipped Pentium)—in software and then run Windows and Windows software in this simulated environment. And their performance is remarkably similar: our overall benchmark scores show a difference of just 5 percent between the two.

But running the emulators with applications that make heavier use of networks points up some compatibility differences. For example, SoftWindows 98 takes advantage of the Mac's built-in TCP/IP networking, so you don't need to configure a separate IP address for Windows. More important, if your Mac is already connected to the Internet via PPP, SoftWindows 98 uses that connection instead of requiring you to create one from within Windows—a feature you'll appreciate when you're on the road.

Windows in a Window Virtual PC's window border contains useful LED-like activity indicators as well as buttons for accessing often used features.

The downside is that SoftWindows 98 is incompatible with some networking software. Virtual PC had no compatibility problems with the networking software we tested, although it requires a second IP address in addition to the one already assigned to the Mac and can't use an extant Mac PPP connection.

Both emulators use large Mac files as their virtual hard disks; both also have a quick-launch feature that lets you put the Windows environment to sleep and reawaken it without having to go through the full boot process, though Virtual PC's implementation of this feature is more than twice as fast as SoftWindows 98's. And although neither emulator has any problem running a variety of basic Windows software, contemporary games really want to run on actual PC hardware (see *The Game Room*, January 1999).

Despite their similarities, the two emulators differ in some significant ways. Virtual PC has a much more polished user interface, handy LED-style indicators that show whether hard-disk or network activity is going on, and many smaller usability details (see "Windows in a Window"). In contrast, SoftWindows 98's interface offers so many configuration options as to be daunting for the novice, and its answer to the right mouse button—pressing the equal sign (=) key or ⌘-R—is a poor solution.

Macworld's Buying Advice

Windows 98 emulation is still a sluggish proposition, but it's fast enough for less performance-critical applications. While the emulators we tested perform similarly and have remarkably comparable features, SoftWindows 98 5.0.4's ability to use the Mac's PPP connection is particularly compelling for mobile users. Virtual PC 2.1.1 is more compatible overall, has a cleaner user interface, and offers a faster quick-start mode. If you decide to use an emulator, your decision will come down to which is more important to you: Virtual PC's compatibility or SoftWindows 98's convenience.—STEPHAN SOMOGYI

SoftWindows 98 5.0.4

RATING: ♦♦♦½ **PROS:** Uses Mac TCP/IP networking; marginally faster than Virtual PC. **CONS:** Rough interface; comparatively slow quick-start feature; unsuitable for many games. **COMPANY:** Insignia Solutions (510/360-3700, www.insignia.com). **COMPANY'S ESTIMATED PRICE:** $169.

Virtual PC 2.1.1

RATING: ♦♦♦½ **PROS:** Useful I/O indicators; clean interface; better compatibility with Windows applications; fast quick-start feature. **CONS:** Needs its own IP address; marginally slower than SoftWindows 98. **COMPANY:** Connectix (650/571-5100, www.connectix.com). **COMPANY'S ESTIMATED PRICE:** $179.

Macworld LAB TEST

Emulation in the Slow Lane

Best result in red. *Reference system in italics.* **Business Winstone 98 scores are absolute numbers.**

Behind Our Tests For more information on the ZD Benchmark Operation's Business Winstone suite, see www.winstone.com. For detailed information on our tests, see www.macworld.com/tests/.—**Macworld Lab testing supervised by Jeffy Milstead**

Photoshop Plug-in Packages

PHOTOTOOLS 3.0 HITS THE WEB, XENOFEX GOES OUT OF THIS WORLD

YOU NEED NIMBLE FEET TO develop plug-ins for Adobe Photoshop. Create a hot new productivity tool or special-effects filter, and something similar is likely to appear in the host program. Nevertheless, there's always room for add-ons, as we see in the latest plug-ins from Extensis and Alien Skin Software.

The big selling point in Extensis's previous version of PhotoTools was the PhotoText utility, which vastly improved on Photoshop 4.0's text function. But with the upgrade of the Text tool in Photoshop 5.0, Extensis dropped the plug-in, replacing it with new modules that let you create seamless tiles and custom bevel shapes. Meanwhile, Alien Skin has responded to Photoshop 5.0 with a new set of filters that let you add a variety of special effects to your images.

Spin a New Tune

While it remains a good productivity tool for almost any Photoshop user, PhotoTools 3.0 has a definite Web-centric flavor. One major addition, PhotoTexture, lets you create seamless tiles for Web-site backgrounds. You can import and combine existing textures or create them from scratch, using a basic set of painting tools and filters. As you paint over the tile's edge, the stroke automatically continues on the opposite side of the frame, making it easy to create seamless textures, which otherwise require some fancy Photoshop footwork. However, the built-in texture-generating tools are rather weak. Don't expect to create the kinds of natural, photo-realistic effects you can produce in Bryce 3D and Kai's Power Tools (both from MetaCreations).

PhotoGroove, the other major addition, lets you transform Photoshop selections into frames with custom-beveled edges. You control the bevel shape by dragging control points on a curve. You can make the frame interior appear as metal, plastic, or chrome, or let the underlying image show through.

PhotoTools 3.0 also includes upgraded versions of older plug-ins. PhotoCastShadow, a handy drop-shadow generator, can now create multiple shadows from a single selection. You can set each shadow's light source, offset, color, softness, noise, and opacity. PhotoButton, which generates beveled buttons for Web sites, now lets you add custom bevels, textures, and bump maps.

Effects on the Go Seven Xenofex filters (clockwise from upper right): Baked Earth, Lightning, Stain, Origami, Flag, Crumple, and Electrify. The background was created in Extensis's PhotoTexture.

The other modules are largely unchanged: PhotoBars lets you set up custom tool bars, PhotoGlow produces halos around a selection, PhotoBevel applies inner and outer bevels, and PhotoEmboss creates embossing and cutout effects. The package also includes PhotoAnimator (♦♦½; *Reviews*, October 1998), a GIF-animation utility that Extensis formerly offered as a $99 stand-alone product.

On the Wild Side

If PhotoTools aims at the Web designer, Xenofex targets the special-effects wizard. Developed as a complement to the company's popular Eye Candy Photoshop-filter package, Xenofex features 16 new effects plug-ins. Among our favorites, Flag ripples your selection; Crumple wrinkles it; Origami makes it appear as folded paper; Baked Earth places it on a rough, cracked surface; and Television adds static. Others include Stain, which creates coffee-stain effects, and Stamper, which fills the selection with copies of any TIFF image (see "Effects on the Go"). Two other plug-ins produce electrical effects: Electrify causes glowing arcs to radiate from your selection, and Lightning generates electrical bolts inside the selected area.

Most of the plug-ins give you lots of options for customizing the effects. For example, Electrify lets you choose the arc lengths, amount of branching, and size and color of the glow, and Flag lets you choose the depth and strength of the ripples. These options help you avoid creating artwork with exactly the same effects that appear in someone else's pieces.

The colorful Xenofex interface resembles Eye Candy's, offering slider controls for most functions and small preview windows. PhotoTools uses a more conventional Mac-like interface, with tabbed palettes, pop-up menus, and a preview window that consumes nearly half the screen. With both programs, you'll want a G3 Power Mac for optimal performance. Most of the filters ran fine on a 180MHz 603e system, but some—especially the Twirl filter in PhotoTexture—were sluggish.

Macworld's Buying Advice

The PhotoTools 3.0 plug-ins are good productivity boosters, especially if you're a Web designer. Xenofex continues Alien Skin's tradition of creating plug-ins that effectively mimic natural effects; most designers will probably find at least a few of them useful.—STEPHEN BEALE

PhotoTools 3.0

RATING: ♦♦♦♦ **PROS:** Effective tools for generating seamless tiles and beveled edges. **CONS:** Slow; weak texture-generation tools. **COMPANY:** Extensis (503/274-2020, www.extensis.com). **LIST PRICE:** $149.95 (upgrade, $49.95).

Xenofex

RATING: ♦♦♦♦ **PROS:** Natural-looking special effects; lots of customization options. **CONS:** Slow on older Power Macs. **COMPANY:** Alien Skin Software (919/832-4124, www.alienskin.com). **LIST PRICE:** $129.

Media-Management Tools

MEDIA ORGANIZERS IN ALL SHAPES AND SIZES

EVEN THE MOST ORGANIZED pack rats can't possibly keep track of all their multimedia files. So when your work demands quick access to graphics, movies, and sound files, it's time to invest in an asset-management tool. Four such programs cover the low and high ends of the market—IMC Media Cataloger 2.0, Photodex CompuPic 1.80, Canto Cumulus Network 4.0, and Extensis Portfolio 4.0—and you get what you pay for.

The fundamental purpose of these programs is to create catalogs of images, movies, and sounds. In addition, each organizer accommodates thumbnail images and preview functions. Except for CompuPic, these applications allow you to assign and search by keywords. Beyond these fundamentals, the more advanced—and expensive—programs offer network access to catalogs, the ability to drag and drop assets into catalogs, scripting, and support for a wide variety of file types.

Such a Drag To add assets easily in Cumulus Network, just drag and drop them into catalogs.

Cataloging on the Cheap

Media Cataloger and CompuPic are inexpensive products that provide only basics. Media Cataloger offers thumbnails, previews, and keyword assignment and searching. If you're an occasional catalog creator on a restricted budget, Media Cataloger may be all you need. The program can only catalog text, PICT, TIFF, EPS, MacPaint, QuickTime, and SND files.

However, Media Cataloger is a better choice than CompuPic. The latter's lack of a Find feature severely hampers it, since you cannot easily sort cataloged graphics. But you can view images in slide-show format or tiled as a desktop pattern, and it also offers batch conversion to a limited number of file formats.

Upper Management

Those who manage large amounts of media should turn to Portfolio and Cumulus. These programs can capably organize and catalog multitudes of media files, as well as application-specific files. In addition to cataloging a greater variety of files than the entry-level programs, these two boast networking capabilities and cross-platform support.

As its name implies, Cumulus Network 4.0 is a client-server asset-management system that includes Canto Cumulus Server and five clients. The $2,495 price seems daunting, but the program is intended for large publishing, printing, and graphic-design houses with extensive networks. This becomes apparent when you discover that, unlike many client-server applications, it lets you log on and administer the server from any client and any location on a TCP/IP network—useful for businesses that span multiple locations. And because the server supports Cumulus's Windows 95 and NT and Unix clients, you can administer from any computer connected to your office.

In addition to the client-server programs, Cumulus Network includes freely distributable browsers for the Mac and Windows 95 and NT. The program is also highly scriptable.

Less Costs Less

Although Cumulus Network 4.0 is a terrific choice for asset management in a large, mixed-platform environment, it may not be the best solution for smaller companies. The $200 Portfolio is scalable, meaning that users with individual copies of the program can operate on a peer-to-peer basis across a network, rather than opt for Cumulus Network's pricey client-server solution. In addition, Portfolio is faster than Cumulus in certain operations. When dragging 50 24-bit TIFF images to both programs running on a 266MHz Power Macintosh G3, we found that Cumulus spent 1 minute, 33 seconds creating the catalog, compared with the 15 seconds Portfolio took.

Although Portfolio may lack Cumulus's free browsers, Unix support, and level of AppleScript support, it offers comprehensive asset management. In many cases it's also easier to use than Cumulus. For example, publishing a catalog as a Web page is very easy in Portfolio, while Cumulus's advanced Internet publishing tools can be daunting for the uninitiated.

Macworld's Buying Advice

Home users who need to organize their digital drawings and photographs may find that Media Cataloger meets their humble needs. But if you don't want your media in a muddle, a professional tool such as Portfolio or Cumulus Network is right for you. Cumulus takes the prize for sheer power, thanks to its network, searching, and scripting capabilities, but if this is more kick than your assets need, flip through Portfolio.—CHRISTOPHER BREEN

CompuPic 1.80

RATING: ♦♦ **PROS:** Slide-show feature; can batch-convert; inexpensive. **CONS:** No search function. **COMPANY:** Photodex (512/406-3020, www.photodex.com). **LIST PRICE:** $40.

Cumulus Network 4.0

RATING: ♦♦♦♦½ **PROS:** Multiplatform; free browsers; highly scriptable. **CONS:** Expensive; slow catalog creation. **COMPANY:** Canto Software (415/905-0300, www.canto.com). **LIST PRICE:** $2,495.

Media Cataloger 2.0

RATING: ♦♦½ **PROS:** Easy to use; inexpensive. **CONS:** Limited file support. **COMPANY:** Interactive Media Corporation (650/948-0745, www.imcinfo.com). **LIST PRICE:** $25.

Portfolio 4.0

RATING: ♦♦♦♦ **PROS:** Fast catalog creation; easy to use; scalable networking. **CONS:** No included browsers or Unix support. **COMPANY:** Extensis (503/274-2020, www.extensis.com). **LIST PRICE:** $200.

AppleShare IP 6

INTRANET SERVER KEEPS GETTING BETTER

ADMINISTRATORS WHO LIKED AppleShare IP 5 are going to love AppleShare IP 6. The new version sports major improvements such as Windows support, TCP/IP printing, a revamped mail server, and a host of smaller but welcome refinements. While AppleShare IP still lacks some advanced features found in specialized Internet/intranet server products, it proves a well-balanced and useful suite—and a good value to boot.

Extended Service

AppleShare IP 6 runs on PowerPC Macs equipped with 48MB of RAM and Mac OS 8.1 or later. Like version 5, it lets Mac clients access files over either AppleTalk or TCP/IP—a decided advantage over Windows NT Server 4.0, which offers only AppleTalk access for Mac clients. Even better, TCP/IP significantly boosts performance: testing revealed that AppleShare IP 6 over TCP/IP is more than twice as fast as Windows NT Server 4.0 over AppleTalk (see "AppleShare Laps NT").

To fit more seamlessly into mixed networks, AppleShare IP 6 also offers Server Message Block (SMB) file sharing. Windows clients can access the server natively over TCP/IP, eliminating the need for special AppleTalk software, and AppleShare IP servers appear in the Network Neighborhood alongside their Windows NT counterparts. Although this feature isn't perfect—file names are limited to 31 characters, for example—it's still reliable, easy to use, and extremely useful.

AppleShare IP 6 continues to support FTP access to files, using the same security permissions as the standard file server. Other file-sharing improvements include account lockouts due to failed log-in attempts, fixed-term accounts, and the ability to resolve aliases via FTP.

All Aboard AppleShare IP 6 makes it easy to share files via AppleTalk, TCP/IP, FTP, and even SMB.

AppleShare IP's Web services are fast; simple; and, with the addition of third-party plug-ins, extensible—perfect for typical intranet sites. Version 6 expands Web capabilities by adding support for W*API plug-ins, keep-alive connections, and custom error pages. The Web engine also shares the file server's permissions, simplifying basic Web security.

But Wait, There's More

In addition to expanding AppleShare IP's file and Web services, Apple has overhauled the mail-server engine. The mail database stores messages only once, even those with multiple recipients, resulting in improved performance and reduced storage requirements. And the server's new Internet Message Access Protocol (IMAP) capabilities are impressive: users with an IMAP client such as Microsoft's Outlook Express can keep their mail on the server; organize it into folders; and even perform fast, full-text searches that use Apple's V-Twin search technology.

The standard POP and SMTP mail services now include simple antispam tools, multiple domains, and scheduled dial-up Internet connections.

AppleShare IP's traditionally weak print services have also been improved: version 6 supports both TCP/IP-based printers and printing clients. Administrators can restrict queue access to individual users, but access is granted based on the owner name of the machine you print from. The print server also allows basic manipulation of the print queue, printer pooling, and support for up to 30 printers.

AppleShare IP 6 still has plenty of room for improvement. It lacks advanced file-sharing features, such as a centralized accounts database, log-on scripts, and multiple default FTP directories. Webmasters will miss Secure Sockets Layer support, virtual hosts, and an integrated search engine. And the print server's inability to support native Windows printing and more-advanced print-queue management is disappointing. Even the installation and administration tools could use work; more-comprehensive setup wizards and a more consolidated administrative console would be welcome.

Macworld's Buying Advice

AppleShare IP 6 is a good product made better; its support for SMB, IMAP, and W*API make it much more versatile and well suited to cross-platform networks. It falls short of perfection, but AppleShare IP is nonetheless an excellent intranet solution for Mac-oriented environments.—J.W. DAVIS

RATING: ♦♦♦♦ **PROS:** SMB, IMAP, and W*API support; TCP/IP printing, faster than Windows NT Server 4.0. **CONS:** No native Windows printing; disjointed administrative tools; no bundled Web-server plug-ins. **COMPANY:** Apple Computer (408/996-1010, www.apple.com). **COMPANY'S ESTIMATED PRICE:** 10 users, $499; 50 users, $999; unlimited users, $1,499.

Macworld LAB TEST

AppleShare Laps NT

Best result in red. *Reference systems in italics.* All scores are in seconds.

Behind Our Tests We copied a 50MB file from a client to the test servers over a Fast Ethernet network. For detailed information on our configuration, see www.macworld.com/tests/.—**Macworld Lab testing supervised by Kristina DeNike**

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QuarkImmedia 1.5

COMPLEX TOOL A MIXED BAG FOR CONTENT CREATORS

QUARKXPRESS BECAME THE leading page-layout program through its combination of high-powered tools aimed at publishing professionals. But it also takes time to learn, exemplifying the principle that the most effective interface for experienced users isn't necessarily easy for novices. QuarkImmedia, Quark's attempt to become a dynamic-media player, follows a similar pattern. Immedia is stuffed with tools for producing a wide range of media, but its interface is not intuitive.

Why Immedia?

If you use QuarkXPress, you may be tempted to consider QuarkImmedia as your multimedia software because it works with the tools and documents you already have. If you create a print catalog, for example, you can use Immedia to make an interactive CD version, replacing static elements with QuickTime movies and sounds, animated buttons, hyperlinks, and other material.

Advanced Technology QuarkImmedia 1.5 boasts many tools for adding dynamic content to your documents. But these tools may be a bit too advanced, given their extreme complexity.

However, Immedia has less value when you're creating dynamic media from scratch. Combined with QuarkXPress, it costs (at $1,290) $300 more than Macromedia Director ($995). As a result, the program probably will not appeal to multimedia-only creators.

As you get the hang of Immedia, you'll discover a host of features that let you create a wide range of projects, from slide shows to CD-based video players. While you can't quite use Immedia to develop something as complicated as Myst, you can get close. The program lacks timeline-based video-editing controls, but provides any other tool a multimedia producer would need.

Lots of Action

Quark has blessed Immedia with many types of actions—from downloading Web files to selecting and copying text for online surveys—that you can control through a scripting language that works for both Mac and Windows. You can use AppleScripts in two ways: automating production work within Immedia or executing multimedia actions for Mac-based recipients. The package also includes a variety of neat sound, video, and transition clips to help you embellish your files.

To view Immedia presentations, your recipients need a copy of the Immedia player. The package includes Mac and Windows versions of the viewer that you can distribute or embed in the file (for example, for CD distribution). When exporting files for use on the Internet, Immedia can automatically create a link that lets users download the player from Quark's Web site.

The Interface Issue

As a plug-in to QuarkXPress 4.02 or later, Immedia adopts the familiar QuarkXPress palettes and menus. However, an interface designed for print publishing doesn't necessarily work as well for producing interactive media. Some aspects of the Immedia interface are downright awkward.

One example: to add an object to the Immedia palette, you select the item and then enter a name for it. There's no Add button or equivalent as you would expect, although there is a Remove From List button that deletes the object from the palette. You could spend a lot of time trying to figure out how to add objects and never stumble across this nonexistent button.

Immedia's use of multistate pop-up lists, rather than multiple check boxes, can be confusing at first. However, it's apparent that Quark chose this course to keep the dialog box at a manageable size.

Given this lack of intuitive controls, few people will figure out how to use Immedia based on their experience with QuarkXPress or other programs (such as video editors, HTML editors, and presentation software). You will need to use the manual, which unfortunately doesn't offer much explanation beyond reciting program features. However, the interactive primer on the CD does a solid job of describing the basic tools, plus it's a great example of what Immedia can do (see "Practice What You Preach"). But you should still plan to spend considerable time figuring out how to use Immedia's many features.

Practice What You Preach QuarkImmedia includes an interactive primer created with the software.

We also found some strange behavior, such as movies disappearing when there was more than one on a page, even though they were not set to be hidden. Cropped movies often obscured text that overlapped the cropped portion.

Macworld's Buying Advice

If you're the rare QuarkXPress user who really needs to transform print documents into interactive electronic versions, QuarkImmedia is worth a look—but be prepared to spend a lot of time learning how to use this package.—GALEN GRUMAN

RATING: ♦♦♦ **PROS:** Rich set of functions adds interactivity to electronic documents created in QuarkXPress. **CONS:** Extremely complex set of tools; unintuitive interface; some output glitches. **COMPANY:** Quark (303/894-8888, www.quark.com). **LIST PRICE:** $395 (requires QuarkXPress 4.02 or later).

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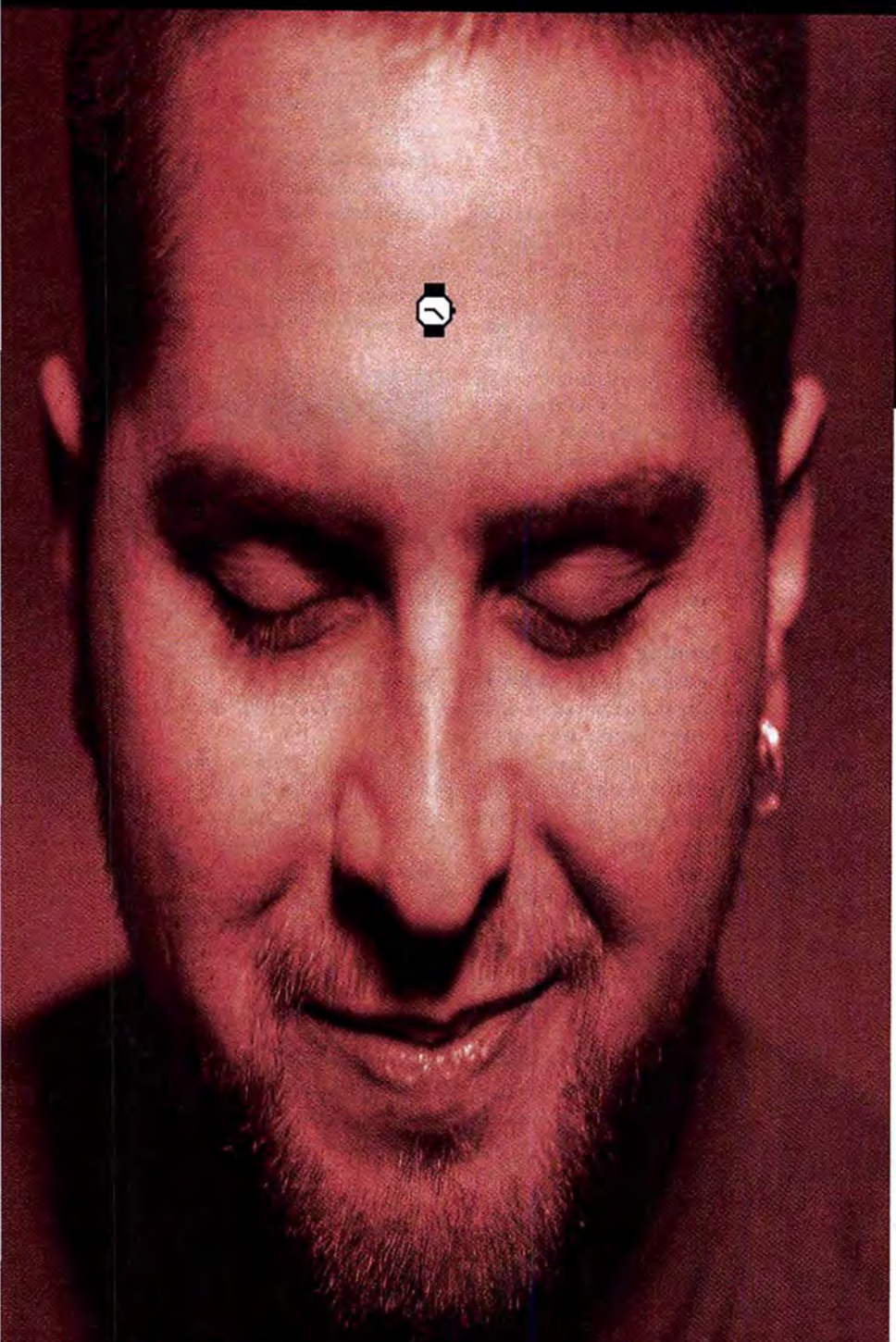

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WebPainter 3.0

GIF-ANIMATION PROGRAM GROWS UP

DURING THE PAST YEAR, THE titans of graphics software have staked their claims in the Web-graphics arena with such programs as Adobe ImageReady and Macromedia FireWorks. WebPainter 3.0, the latest version of Totally Hip's Web animation software, makes its mark with layers, transition effects, vector tools, and strong support for QuickTime 3.0. The result is a simple but capable animation package that lacks some of its competitors' fancier graphics capabilities.

A Soft Cel

At its heart, WebPainter is a cel-animation program. You create animations frame by frame, using simple painting tools or images imported from other programs. As you add new frames, you can quickly preview the animation with VCR-like playback controls. An onion-skinning feature lets you see faded versions of the adjacent frames.

Playing in Layers WebPainter 3.0 gives you 32 layers, whether you need them or not.

With WebPainter 3.0, you can now create projects with up to 32 layers, a crucial addition that more closely simulates traditional cel-animation techniques. For example, you can have a still background on one layer, animated characters on a second, titles on a third, and so on. Although you can merge, hide, and rearrange layers, the layer-handling options are limited and somewhat inflexible. Each project, no matter how simple or complex, automatically gets 32 layers. Even if you plan to use only 4, there's no easy way to hide the other 28 in the Layers window (see "Playing in Layers").

WebPainter 3.0 also adds a new vector-drawing mode, with simple path- and shape-editing tools. Each cel or layer in an animation can be in vector or bitmapped mode. However, if you switch from vector within a cel or layer, that converts the vector objects to bitmaps. The vector mode lacks a text function—this is unfortunate, because the text tool in bitmapped mode offers only basic formatting options.

Entry-Level Painting

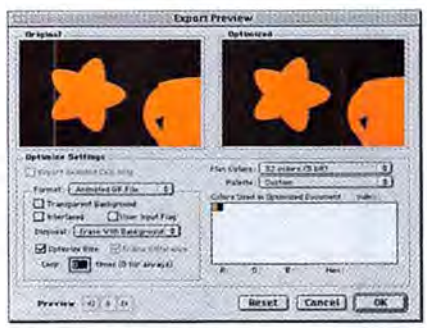
Painting tools include a brush, airbrush, eraser, eyedropper, and paint can; you can create custom brush shapes, but some of the fancier tools you might expect, such as a rubber stamp, are missing. You also get basic selection tools—a lasso, marquee, and magic wand—but nothing more. Unfortunately, the wand is limited to selecting areas with an identical solid color; you cannot set a range of tolerance, as in Adobe Photoshop and other programs.

Other new enhancements are transition effects—including Cross Fade, Explode, Radial, Wipe, Slide, and Implode—that you can insert between cels or after a single cel. You can also apply Photoshop filters to single frames or one of the new QuickTime 3.0 filters to multiple frames. Two QuickTime filters in the package, Ripple and Film Noise, work on existing cels. The former adds an animated rippling effect, while the latter adds moving scratches and hair. Two other QuickTime filters, Cloud and Fire, add new cels with the named effects.

Staying in QuickTime

WebPainter 3.0 offers full support for QuickTime 3.0; the package includes QuickTime Pro, an enhanced version of Apple's commercial multimedia software. You can open QuickTime movies and save them using any codec on your system, including the Sorenson Video codec. But the program is not made to handle movies with hundreds of frames. You can apply only a few operations simultaneously to multiple cels, and opening a movie with even a few dozen frames requires extra RAM.

However, most designers will probably use WebPainter to create GIF animations, the program's nicest option. When you're ready to export your animation, simply pick from a variety of color palettes and quickly preview that palette's effect on image quality (see "Squeeze That GIF"). You also get the other GIF-animation options you'd expect, including size optimization, which masks redundant elements in each frame. All this results in a tightly compressed animated GIF file.



Squeeze That GIF Choose from different color palettes and quickly see their effect on image quality.

Macworld's Buying Advice

WebPainter 3.0 is inexpensive and easy to use, combining entry-level painting and drawing tools with basic animation functions. It lacks the sophisticated image-editing and illustration features found in more-costly programs, but these would be overkill in a package designed primarily for creating Web animations. Less forgivable is the lack of a strong text tool, since ad banners are a big stock-in-trade for many Web artists. Still, WebPainter's animation capabilities far surpass those in Adobe ImageReady and Macromedia FireWorks. Anyone who spends a healthy portion of time creating Web animations should consider it.—STEPHEN BEALE

RATING: ★★★½ **PROS:** Easy to use; inexpensive; layers enhance cel animation. **CONS:** Limited text tool; restricted layers function. **COMPANY:** Totally Hip Software (604/685-6525, www.totallyhip.com). **LIST PRICE:** $199.

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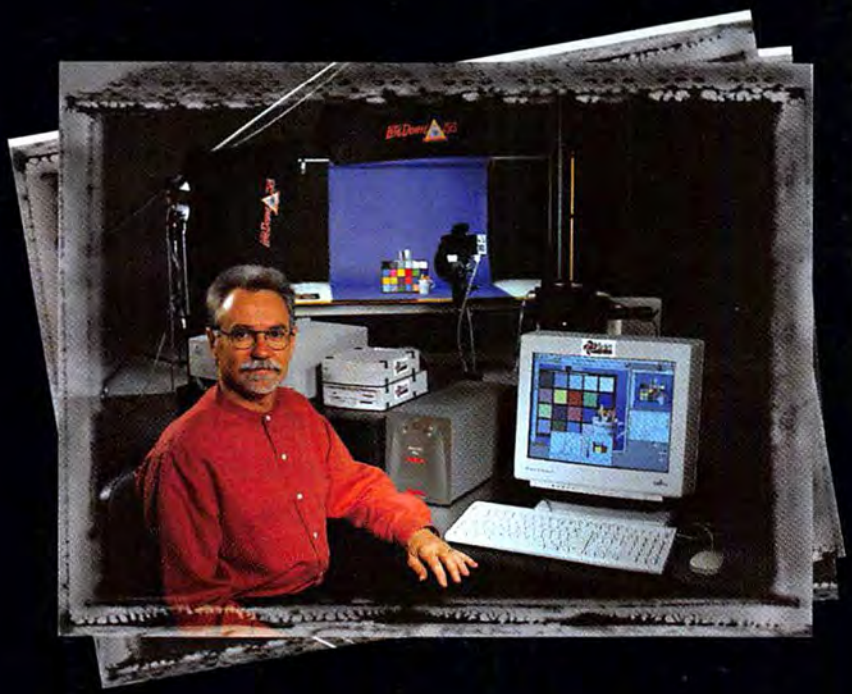

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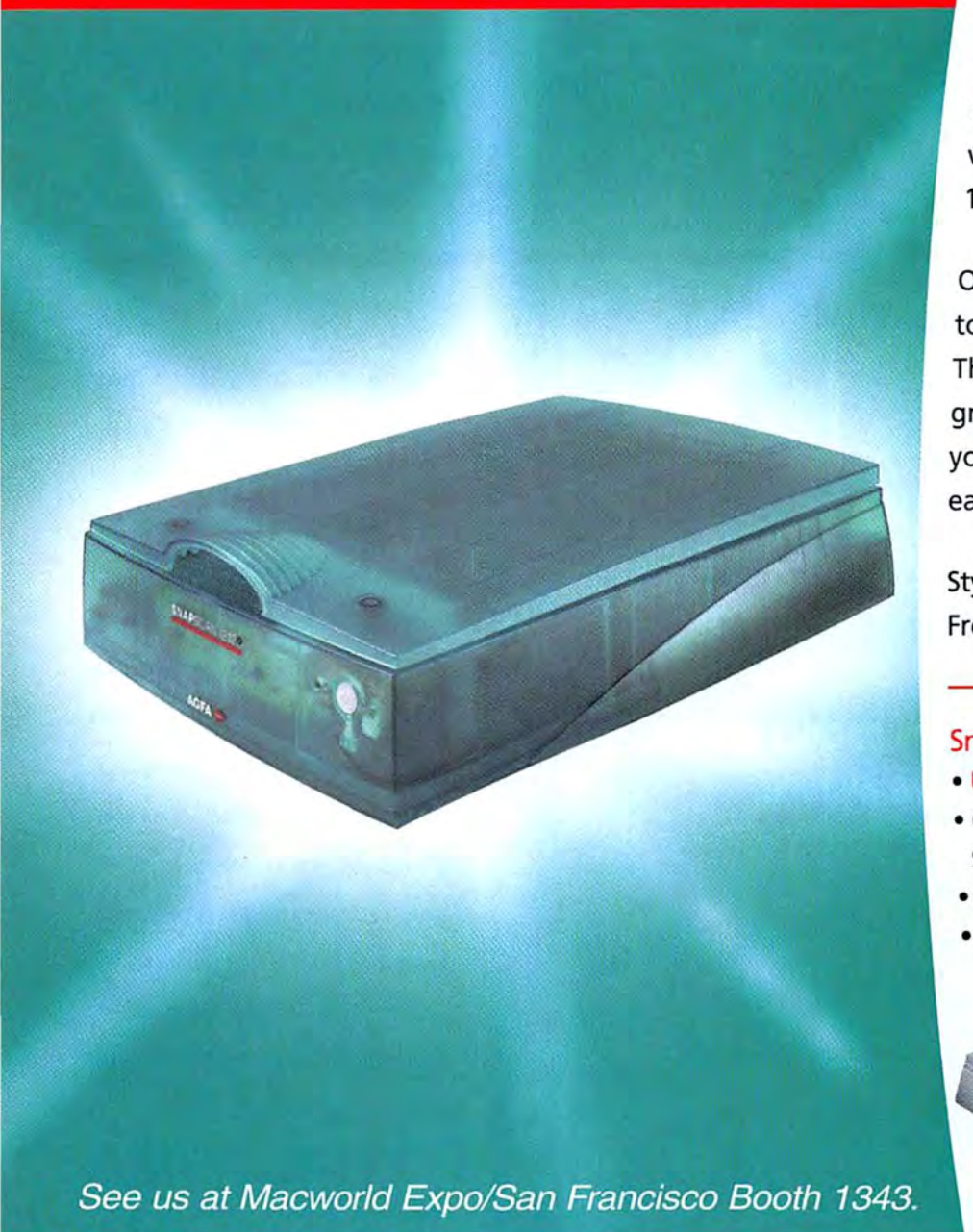

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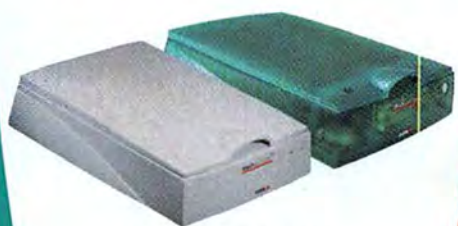

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Adobe PageMill 3.0

WEB TOOL GETS ME-TOO UPGRADE

WHEN ADOBE PAGEMILL debuted, it was the first of its kind: a program that let you edit Web pages—without knowing HTML—via a word processor–style interface. But in the two years since Adobe Systems released the last Mac version of PageMill, the Web has changed remarkably. With version 3.0, Adobe adds a few new features to put the Mac version in parity with PageMill 3.0 for Windows. However, it's clear that time has passed PageMill by.

PageMill 3.0 lets you control frame set borders, set table height and width, preview Java applets, place multiple forms on a page, use progressive JPEG images, access a 216-color Web-safe palette, and apply fonts via the **<font face>** tag. These are all vital features for creating Web pages, but PageMill's competitors, such as GoLive CyberStudio, have offered these functions for some time.

Bright Spots

To be fair, the program offers a few original touches. For example, PageMill 3.0 provides better support for the contextual menus in Mac OS 8.5 than does any other application we've seen. Control-clicking almost anywhere in the program brings up a menu containing a raft of appropriate commands.

PageMill continues to offer a friendly interface that lets you construct Web pages without any HTML knowledge. Its context-sensitive tool bars present a large selection of page elements you can add to your document with one click, although the tool bars' icons are a bit too cryptic.

The program offers no free-form design feature, so you must use PageMill's table tools to create layouts. The program makes it too difficult to select items and cells in tables, but the contextual menu's Select More and Select Less commands mitigate this flaw by letting you zero in on the table elements you want to modify.

For creating interactive forms, PageMill is at the top of its game. You can quickly build pages that gather customer information by clicking on items in the tool bar and then editing their default text.

PageMill's frame-editing features are also top-notch. You create a frame set by option-dragging frames from the corner of your document. Making links within a PageMill frame set is also easy. You simply choose a window from a thumbnail display of your frame set.

PageMill 3.0 includes the site-management features formerly found in Adobe SiteMill. From the Site window, you can view all the pages in your site, find broken links, verify the integrity of off-site links, and rename or redirect dozens of links in one batch. However, the program paused or froze completely when it opened sites containing several hundred pages.

Page Control PageMill 3.0 supports multiple typefaces and lets you access a Web-safe palette.

In general, we found PageMill 3.0 a bit slow. On a PowerBook 1400, there was a perceptible delay between typing a letter and seeing it on screen.

Macworld's Buying Advice

Once targeted at professional Web designers, PageMill is now clearly aimed at consumers and businesspeople. The new features are sure to please loyal users. But PageMill no longer measures up to the similarly priced FileMaker Home Page and CyberStudio Personal Edition. Once tops in its class, PageMill has become an afterthought and an also-ran.—JASON SNELL

RATING: ♦♦♦ **PROS:** Support for fonts and other current HTML features; good contextual-menu support; excellent frame editing. **CONS:** Poky on slower Power Macs; no free-form layout tools; cryptic tool bars. **COMPANY:** Adobe Systems (408/536-6000, www.adobe.com). **COMPANY'S ESTIMATED PRICE:** $99.

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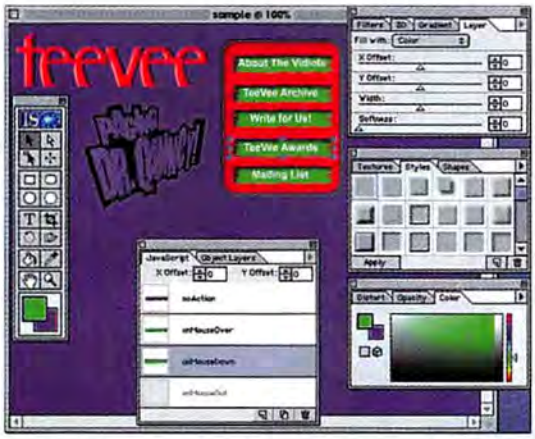
Adobe ImageStyler

EASY-TO-USE WEB GRAPHICS TOOL

AFTER YEARS OF MAKING DO with homegrown programs, Web designers have received a flurry of powerful Web graphics tools. While Adobe ImageReady and Macromedia Fireworks have drawn most of the attention, the most impressive release of the lot may be Adobe ImageStyler, an easy-to-use Web graphics program that can be a vital addition to any Web designer's toolbox.



On the Button ImageStyler's floating palettes make it easy to create buttons and other Web elements.

It's All about Objects

ImageStyler doesn't let you create graphics pixel by pixel. Instead, you place such objects as EPS graphics, bitmapped image files, and text on a pasteboard. When you're finished, you can export the graphics in a variety of Web formats.

Once you've placed an object in ImageStyler, you can apply up to five layers of transformations. You can control an object's color or opacity; apply a 3-D bevel or emboss effect; distort, shift, or blur the image; and much more. For example, to create a drop shadow, you add a new layer, shift its position, change its color to black, apply a blur, and reduce the opacity. Once you've done this, the drop-shadow effect will be consistent even if you change your object's size or shape, or replace it with a different object.

ImageStyler is billed as a tool for businesspeople and others who are not graphics professionals. However, the program's cornucopia of controls will appeal more to graphics pros than to casual users, who may find the many settings too complicated. Still, ImageStyler doesn't leave less advanced users behind. Its Styles palette contains dozens of preformatted styles, each containing multiple, multilayered effects. A Textures palette lets you quickly apply textures. A Shapes palette provides several dozen EPS objects that can serve as the basis for buttons and other elements.

ImageStyler provides a fast and easy way to create JavaScript-based rollover images. You make copies of an object, each corresponding to a different button state, and modify the copies to your liking. An Export command automatically creates GIF or JPEG images for each button, along with an HTML document containing JavaScript code.

Another time-saving feature is the ability to make an *alias* of an object—a duplicate that retains the original object's attributes. You can modify an object's shape or color and see the change immediately applied to that object's aliases.

ImageStyler's most innovative feature may be HTML batch-replacement, which lets you replace HTML-styled text with graphics containing the same text. For example, if you have an old Web site containing ugly headers that use the <H1> style, ImageStyler can search the HTML code for that style, pick out the text, generate a graphic using that text, and replace the header with a reference to the new image.

Macworld's Buying Advice

ImageStyler is a versatile, powerful Web graphics tool that has something for everyone, from businesspeople to professional Web designers. It lacks animation features but otherwise covers all the bases for creating Web graphics. If you spend time creating banners, buttons, and other elements for Web pages, ImageStyler will prove invaluable.—JASON SNELL

RATING: ♦♦♦♦ **PROS:** Easy-to-use pasteboard interface, powerful image-transformation tools, simple rollover-creation interface, ability to batch-transform HTML text into graphics. **CONS:** No animation tools. **COMPANY:** Adobe Systems (408/536-6000, www.adobe.com). **COMPANY'S ESTIMATED PRICE:** $129.

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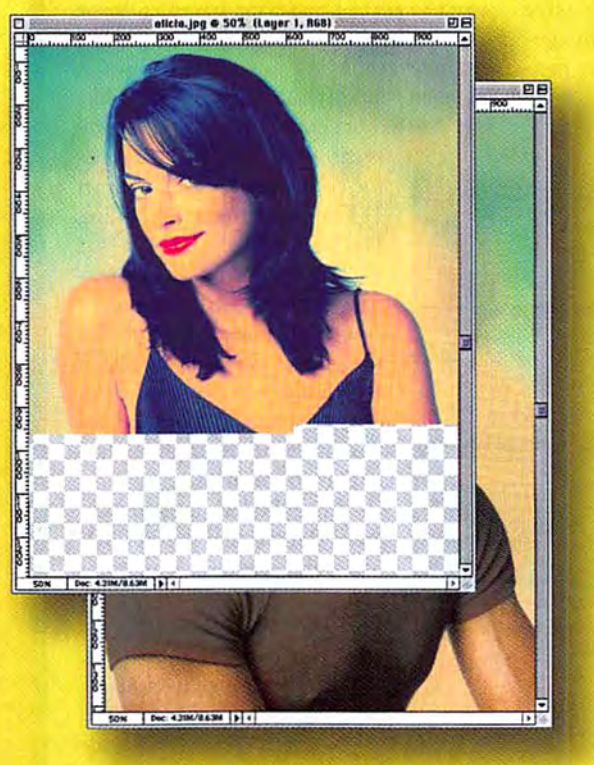

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LaCie DVD-RAM

FIRST DVD-RAM DRIVE SHOWS PROMISE

DVD-RAM DRIVES, WITH THEIR ability to read DVD media and write to special DVD-RAM discs, are certain to gain substantial ground against other removable-media devices. Macintosh users can now get their first taste of the technology with the $799 LaCie DVD-RAM, an external SCSI drive based on a mechanism developed by Matsushita. The drive reads DVD-ROM, DVD-R, CD-ROM, CD-R, and CD-RW media and writes to single-sided, 2.6GB DVD-RAM media ($30) or double-sided, 5.2GB discs ($40). You can't use DVD-RAM discs with current DVD-ROM drives, but Toshiba, Hitachi, Pioneer, and Matsushita say they are developing a new generation of DVD-ROM drives that will read DVD-RAM media.

ARNOLD TIOSEJO

The LaCie drive connects to a standard Mac SCSI port and ships with Software Architects' DVD-RAM TuneUp application, which lets you format the DVD media. Unlike with CD-R, the DVD-RAM volume appears on the Mac desktop. And unlike both CD-R and CD-RW, DVD-RAM lets you erase individual files.

The drive performed well when backing up data with Dantz Development's Retrospect 4.1Ai software. Backing up to the DVD-RAM drive was nearly twice as fast as archiving to tape and nearly 25 percent faster than copying to CD-R media. However, it was about 20 percent slower than backing up to magnetic media. Performance suffers when you use the Finder to copy files, since the cartridges are formatted into 2K sectors instead of the 512K sectors the Mac OS prefers.

You can play DVD movies on the drive, but you'll need an MPEG board, such as E4's CoolDVD Mac DVD Playback Card, to decompress the encoded video.

The discs themselves are housed in protective cases that resemble CD caddies. Some of the 2.6GB discs come in cases you can open, but the double-sided, 5.2GB media all use permanent cases.

The promise of DVD-RAM is that someday all DVD-ROM drives might read DVD-RAM media. However, Hewlett-Packard, Philips, and Sony have announced a competing format, DVD+RW, with features similar to those of DVD-RAM. Vendors backing DVD+RW will not include DVD-RAM read compatibility in their forthcoming DVD-ROM drives.

Macworld's Buying Advice

If you want a DVD-ROM drive and you're looking for a backup device, the LaCie DVD-RAM drive is a good buy. For now, you'll share data only with yourself, but you'll be an early adopter of what may become a universal standard.—KRISTINA DENIKE

RATING: ♦♦♦ **PROS:** High capacity; adequate speed. **CONS:** Not yet compatible with DVD-ROM drives. **COMPANY:** LaCie (503/844-4500, www.lacie.com). **COMPANY'S ESTIMATED PRICE:** $799.

Macworld LAB TEST

LaCie DVD-RAM Beats CD-R

Best results in red. *Reference systems in italics.* **All scores are in seconds.**

*NA = not applicable. *Using Adaptec Toast 3.5.3.*

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Creation Station Pro

AFFORDABLE, SOLID GRAPHICS TABLET

SUZANNE ROADY

OVER THE YEARS, GRAPHICS tablets have moved steadily closer to the computer artist's ultimate dream: input devices that replicate the feel and control of traditional brushes. CalComp's Creation Station Pro doesn't introduce any new, groundbreaking features, but it's a well-designed tablet that further reduces the barriers between artists and their digital medium. It consists of a cordless, batteryless, pressure-sensitive pen; a cordless five-button mouse; and a graphics tablet available in 6-by-9-inch, 12-by-12-inch, and 12-by-18-inch models. You also get CalComp's TabletWorks control panel, which offers numerous options for customizing the tablet. We tested the 12-by-12-inch version with Adobe Photoshop 5.0, MetaCreations Painter 5.5, and Macromedia FreeHand 8.0.

The stylus features two programmable buttons, one of which converts the pen into an eraser tool within your graphics software. Unfortunately, the TabletWorks installer fails to add a plug-in that you need to activate the eraser in Photoshop. Instead, you have to locate the plug-in on the CD-ROM and install it yourself.

Despite this minor glitch, the stylus has a natural feel—gradually tapering toward the tip—and glides effortlessly across the tablet surface. As you draw, you'll notice that the stylus feels like a real pen rather than an input device. The mouse, however, has a much cheaper feel.

The TabletWorks control panel lets you assign keystrokes or other actions to each button on the stylus or mouse. It also provides several options for mapping tablet actions to cursor movements on screen. For example, you can choose to have the entire tablet surface map to a small window on the display. However, there's no printed TabletWorks documentation, and the online help system does a poor job of explaining the mapping options.

The Creation Station Pro is a well-designed graphics tablet that goes a long way toward replicating the feel of traditional painting tools. Unfortunately for CalComp, archrival Wacom has pushed the envelope even further with its Intuos system, which introduces such innovative features as a digital airbrush and a 4-D mouse that can rotate objects as you're moving them on screen (see *Reviews*, January 1999).

Macworld's Buying Advice The Creation Station Pro is considerably cheaper than the equivalent Intuos tablets, and the technology gap isn't huge, because many of the Intuos features have yet to gain support in leading graphics programs. If those new features are important to you, go with one of the Wacom tablets. But if you want a solid, reasonably priced tablet and don't need the bells and whistles, the Creation Station Pro is a good choice.—STEPHEN BEALE

RATING: ★★★½ **PROS:** Well-designed pen with natural feel; reasonably priced. **CONS:** Poor documentation; missing some competitive features. **COMPANY:** CalComp (800/458-5888, www.calcomp.com). **COMPANY'S ESTIMATED PRICE:** 6-by-9-inch tablet, $289; 12 by 12 inches, $389; 12 by 18 inches, $599.

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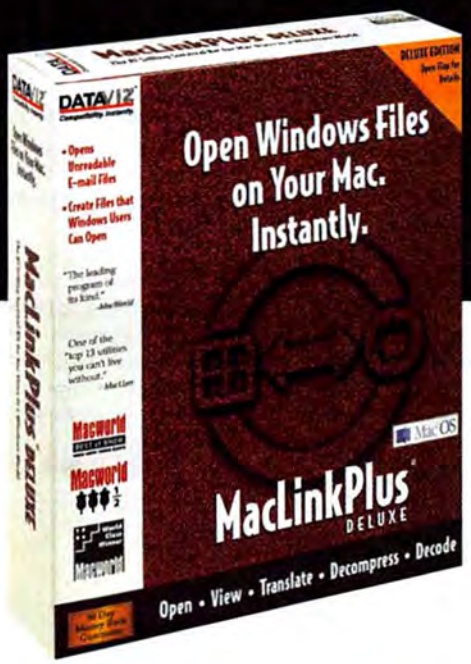

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KL-W9000

REAR-PROJECTION MONITOR

REAR-PROJECTION SYSTEMS ARE great tools for making presentations, but they're also costly, heavy, and difficult to set up. Sony's KL-W9000 LCD Projection Data Monitor combines the best aspects of rear-projection monitors and LCD projectors, while eliminating the major drawbacks of each.

Rear-projection monitors offer excellent image contrast by fully enclosing the path between the internal light source and the rear-projection screen. However, most use three CRTs that must be continually realigned. In the KL-W9000, Sony has replaced the CRTs with LCDs, eliminating alignment hassles.

The $6,599, 50-inch KL-W9000 and its $5,299, 37-inch sibling, the KL-W7000, feature a 16:9 aspect ratio—great for watching letterboxed home movies, but it wastes screen space when you're viewing most computer images. Both also use a staggered pixel pattern, which reduces the sharpness of projected data but produces smoother-looking movies. The KL-W9000 weighs in at about 107 pounds—much lighter than systems that use CRTs. Setting it up is no more difficult than installing a multisynchronous monitor.

ARNOLD TSOSEO

Since the Sony monitors are based on LCD technology, we compared the KL-W9000 with the Epson PowerLite 5500C, our Editors' Choice among ultraportable projectors (see "Traveling Light," January 1999). We subjected both to our full battery of tests for projection systems.

In a dark room, the Epson projector had a much brighter, clearer image than the Sony monitor. Both looked fine when displaying large type in a PowerPoint presentation, but the KL-W9000's staggered pixel pattern made normal-size text, such as what you might see in a Web browser, difficult to read.

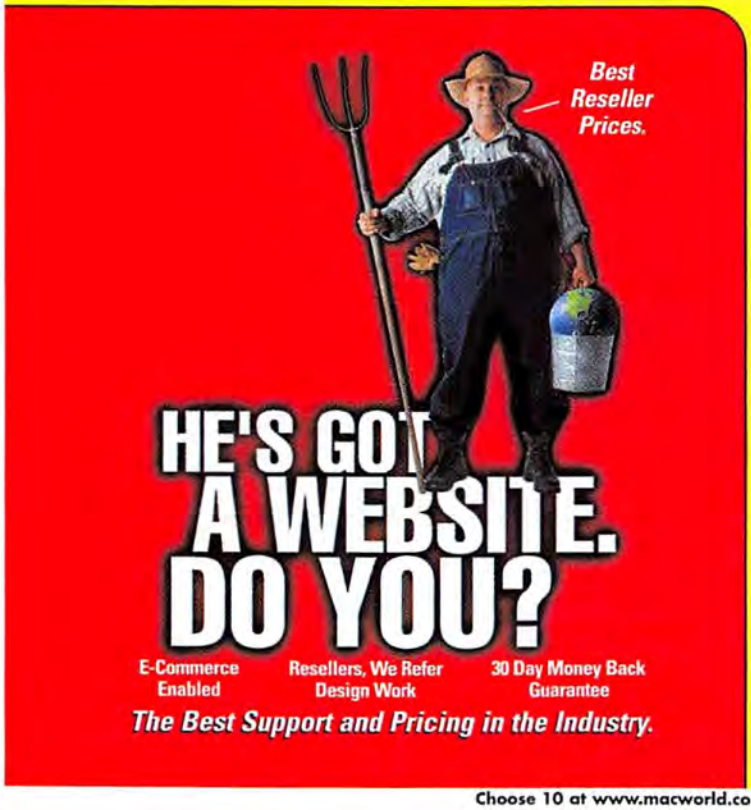
When showing movies from a DVD player, the KL-W9000 produced smoother images than did the Epson projector. The projector's image looked sharper, but its rectangular pixel pattern was distracting when we watched movies. With the lights switched on, the KL-W9000 was the clear winner—its enclosed light path allowed it to display a high-contrast image.

Sony's built-in sound system does a great job of reproducing soundtracks with high volume and clarity.

Macworld's Buying Advice

Despite the KL-W9000's great movie-playing performance, Sony is marketing it as a data monitor, and we can't excuse the staggered pixels. Still, if you're willing to view data in larger type sizes, the KL-W9000 is a terrific conference room display.—JEFF PITTELKAU

RATING: ▮▮▮▮ **PROS:** Lighter than most rear-projection monitors; 16:9 aspect ratio and several zoom modes support letterboxed movie viewing. **CONS:** No TV tuner; S-Video inputs available only on rear of monitor. **COMPANY:** Sony Electronics (201/930-1000, www.sony.com). **COMPANY'S ESTIMATED PRICE:** $6,599.



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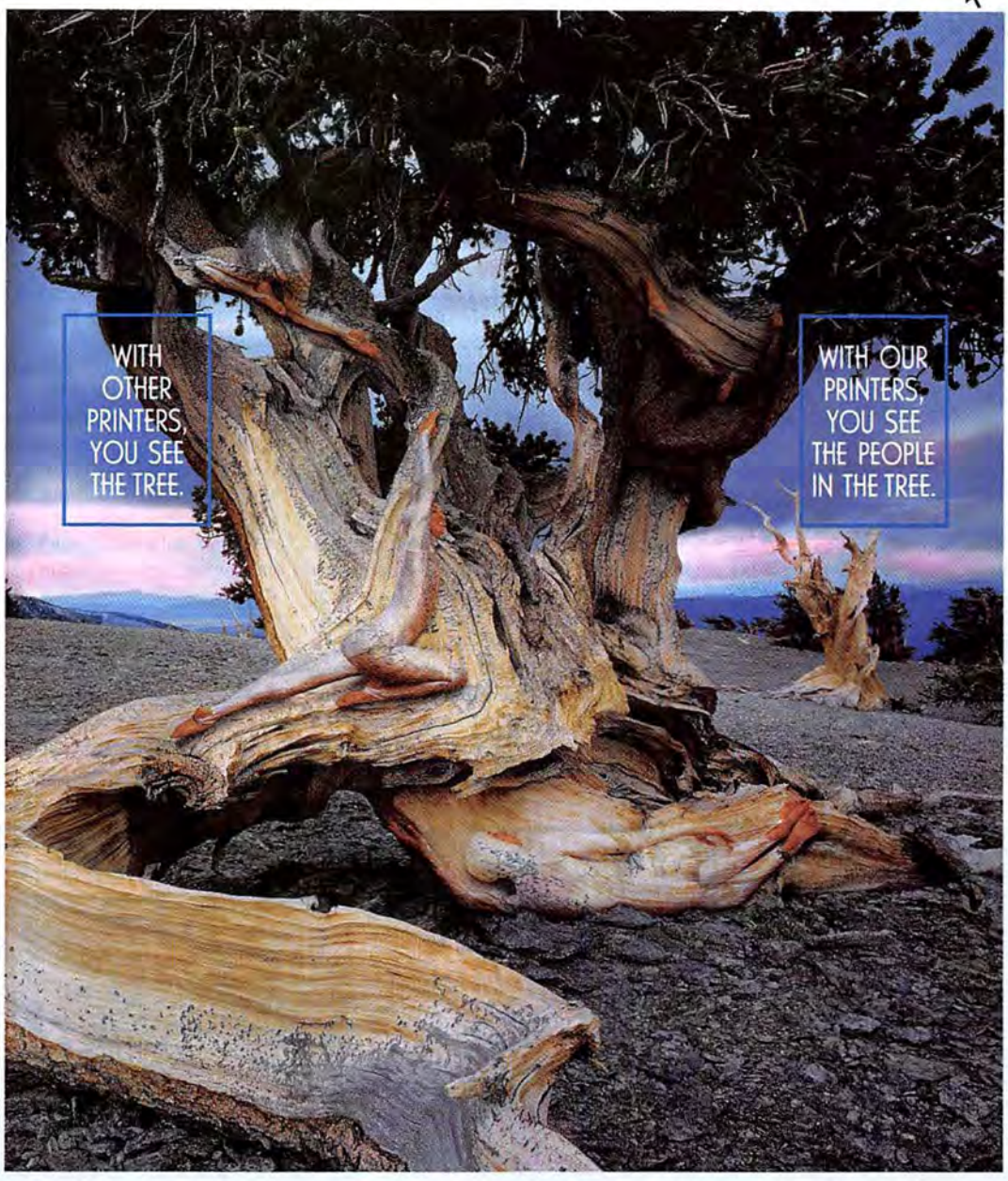

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MouseHouse 2.0 Macintosh Starter Kit

HOME AUTOMATION SYSTEM PUTS YOUR MAC IN CONTROL

LATE AT NIGHT, YOU REALIZE that you left the kitchen lights on. Instead of trudging downstairs, you reach for the remote control next to your bed, press a few buttons, and go to sleep. With MouseHouse Electronics' MouseHouse 2.0 Macintosh Starter Kit, you don't have to be the chairman of Microsoft to have everything in your house at your fingertips.

The MouseHouse home automation system is based on the industry-standard X-10 USA's ActiveHome interface, which sends commands to modules that let you control a wide variety of electrical devices.

GIBSON

Although there are more advanced systems on the market, X-10 uses your home's existing electrical wiring, so you don't have to rip apart the walls to install it.

MouseHouse's ActiveHome interface plugs into any grounded wall outlet; it connects to the Mac's serial port using a supplied cord and adapter. The MouseHouse software lets you program the interface to turn lights and appliances on or off whenever you choose. Because the interface has its own memory, your Mac doesn't even have to be running when MouseHouse sends commands.

The MouseHouse starter kit comes with an ActiveHome interface and one lamp module. (X-10–compatible modules are widely available at stores like Radio Shack and on the Web.) The kit also includes a handy key-chain remote and a universal remote that works with most popular consumer audio and video equipment. With either remote, you can send X-10 commands to an included plug-in transceiver that transfers the signals to your home wiring. You can even program a series of commands—say, dim the lights, turn on the TV, and turn up the heat—to begin with the press of a button on the remote.

The MouseHouse application software does an adequate if uninspiring job. For example, editing module names is more cumbersome than it should be, and setting lighting schedules by entering separate on and off times is a chore; sliding controls would be faster and simpler. There's also no way to troubleshoot the interface without running a series of AppleScripts.

Unfortunately, MouseHouse 2.0 isn't as hands-free as the Windows version of X-10 USA's ActiveHome software. However, we avoided some of the Mac software problems by running the Windows counterpart on a Mac using Connectix's Virtual PC 2.0.

Macworld's Buying Advice Although the software could be improved, MouseHouse is a good way for Mac users to automate their homes without spending a fortune. But even though MouseHouse may start your dishwasher, don't expect it to clear the kitchen table.—FRANKLIN TESSLER

RATING: ❖❖❖ **PROS:** Easy setup; uses widely available hardware. **CONS:** Software lags behind Windows version. **COMPANY:** MouseHouse Electronics (810/336-9000, www.mousehouse.net). **COMPANY'S ESTIMATED PRICE:** $119.95.

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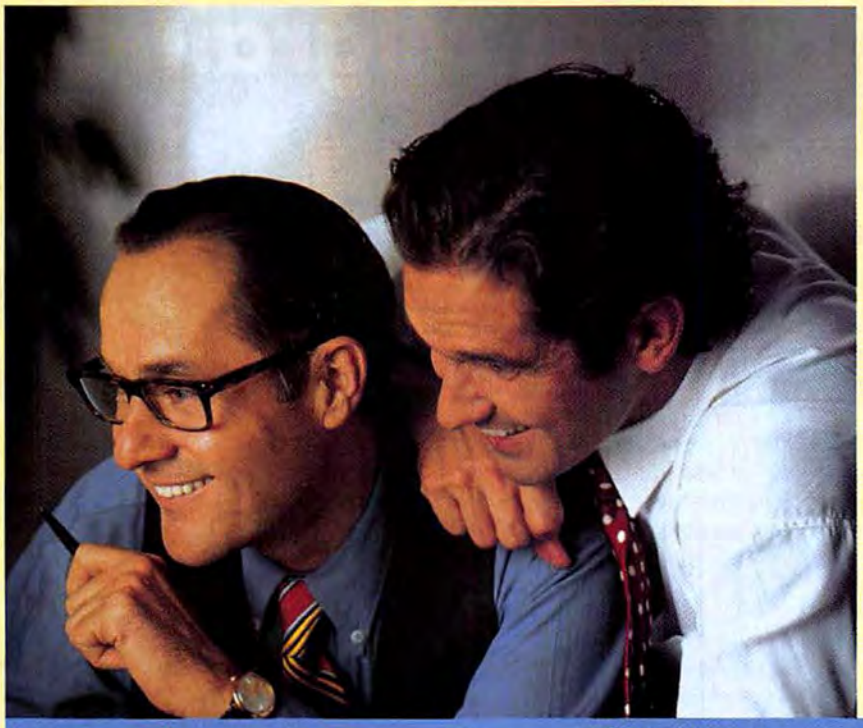

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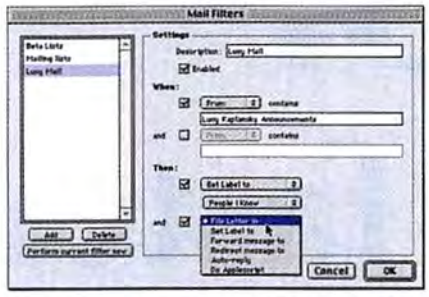
PowerMail 2.2

E-MAIL CLIENT LACKS POWER

THE COMPETITION IS FIERCE among Mac-based e-mail clients, which include Microsoft's free Outlook Express, Qualcomm's Eudora Pro, and Bare Bones Software's Mailsmith. CTM Development's entry, PowerMail 2.2, supports both popular e-mail protocols (POP and IMAP) and makes it easy to switch from Eudora—or Claris Emailer—by allowing you to import messages from either program. But power users will find that the $49 package has a way to go before it can truly challenge Eudora Pro.

PowerMail uses Apple's V-Twin search technology (also found in Mac OS 8.5's Sherlock) to index its mail database, resulting in fast searches, even through thousands of mail messages. The program supports other important Apple technologies, such as AppleScript and drag and drop. PowerMail also offers excellent multiple-language support; you can mix and match different languages (for example, English and kanji text) within the same message. The usual bells and whistles are here: PowerMail colors quoted text in messages, lets you create folders and subfolders to manage your mail, and lets you choose from multiple signatures and multiple mail accounts.

However, unlike Outlook Express, PowerMail doesn't have a built-in parser to display HTML-formatted e-mail; instead, you click on a button to view the HTML in your default browser.



More Power, Please! PowerMail 2.2 suffers from poor mail filtering, as shown here. The criteria for filtering are simply too limited to be very useful.

PowerMail uses an inflexible approach to e-mail filtering, an important function given the ever increasing volume of e-mail that users have to deal with. You can create as many filters as you want, but you're limited to just two filter criteria, you can't control the order in which filters execute, and you can perform only limited actions on filtered mail.

PowerMail's address book also needs improvement. The program sorts on the first name, not the last, and you can have only one e-mail address associated with each person. Worse, the obvious workaround for the latter problem—entering the name twice—is ineffective. When you type the person's name into the New Message form, PowerMail autocompletes the address entry, and there's no way to tell which address you've gotten.

A CTM Development spokesperson says that filtering and address-book changes are high on the list for future improvement.

Macworld's Buying Advice If you're used to the free Eudora Light or the e-mail component of Netscape Communicator, you'll find PowerMail 2.2's abilities to be a revelation, as will those who receive mail in other languages. But for experienced e-mail users, PowerMail isn't ready to thrust aside the likes of Eudora Pro or the free Outlook Express.—TOM NEGRINO

RATING: ▮▮▮ **PROS:** Handles POP and IMAP e-mail; offers excellent message searching; supports multiple languages. **CONS:** Poor mail filters; inadequate address book. **COMPANY:** CTM Development (800/424-9933, www.ctmdev.com). **COMPANY'S ESTIMATED PRICE:** $49.

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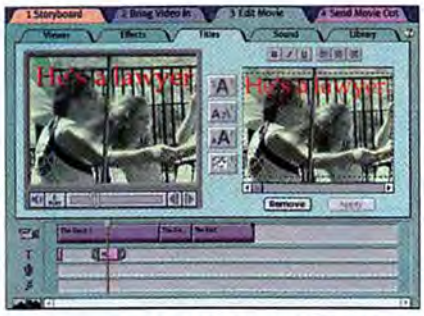
Avid Cinema 1.2

MINIMALIST VIDEO-EDITING TOOL

UNTIL RECENTLY, JUST ABOUT the only way to get a copy of Avid Cinema—Avid Technology's quick-and-easy video-editing system—was to find it bundled with such multimedia Macs as the Performa 6400 and the Power Mac G3 All-in-One. No longer. Avid Technology has released Avid Cinema 1.2.2 as a stand-alone product. But aside from a tossed-in copy of QuickTime 3.0, there are no obvious improvements.

This is both good and bad news. Avid Cinema has always been the embodiment of simplicity. Within Avid Cinema, you'll find Storyboard, the area where you plan your video production; Bring Video In, for capturing video from a composite-video or S-Video source; Edit Movie, where you arrange your clips as well as add transitions, titles, and sound; and Finish Movie, for sending your movie to videotape or saving it as a QuickTime movie. Just march through the tabs to make your movie—plan, capture, edit, and output—and you're done.

But as simple as this process may be, it's never been very flexible. For example, if you prefer to capture one long clip and divide it into short pieces rather than capture short clips and string them together, you have to go through a laborious process of dividing, cutting, and renaming pieces and pasting them to and from the Storyboard. You'll find that it's easier to accede to the program's design and simply capture in small chunks.



Pictures and Words Adding scrolling titles to your video is a snap with Avid Cinema 1.2.2.

Another curious thing about Avid Cinema is that although the program requires QuickTime 3.0, it lacks some of QuickTime's obvious advantages. For example, from within Avid Cinema you can compress your movies only with the JPEG and Cinepak codecs. Granted, you can save your work as an uncompressed QuickTime movie and then use QuickTime Pro to compress it with the Sorenson Video and QDesign Music codecs, but it seems odd that these compression schemes aren't directly available within Avid Cinema.

In addition, Avid Cinema 1.2.2 works only with Power Macintosh G3 systems that contain Apple Computer's Audio/Video I/O card. Owners of previous versions of Avid Cinema shouldn't feel compelled to buy this version, with its minimal improvements, as it works only with new hardware. Also, Avid Cinema's effects and transitions are all too brief. Sure, few people require a barn-door or dissolve effect that lasts seven seconds, but one could certainly wish for a fade-in or -out that lasts that long.

Macworld's Buying Advice Avid Cinema allows you to easily create perfectly reasonable videos, complete with titles, effects, and additional audio tracks. But the price you pay for this ease of use is an inflexible interface that may rein in your more creative urges.—CHRISTOPHER BREEN

RATING: ❚❚❚ **PROS:** Editing video is easy. **CONS:** Inflexible interface; no internal support for QuickTime 3.0 codecs; works only with Power Mac G3 architecture. **COMPANY:** Avid Technology (978/640-6789, www.avidcinema.com). **COMPANY'S ESTIMATED PRICE:** $139.

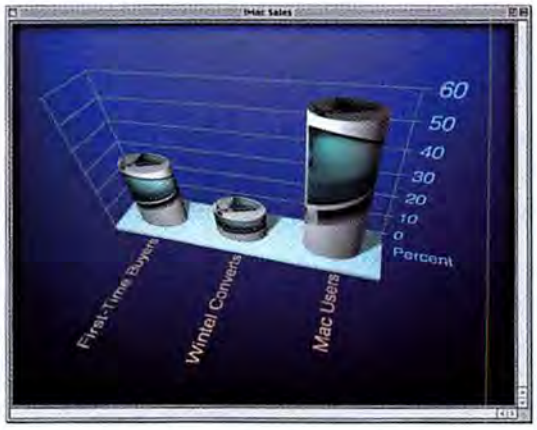
Charts Pro

CREATE STUNNING 3-D CHARTS IN MINUTES

WHEN YOU'RE PRESENTING numerical charts, flash sometimes counts as much as substance. Charts Pro 1.0, which began life as Adrenaline Software's OpenDoc-based Numbers & Charts, lets you transform even the most mundane sales figures into dazzling presentations.

Charts Pro, which no longer requires OpenDoc, sports a logical, uncluttered interface, belying its capabilities, that makes navigating the program simple. Although Charts Pro lacks its predecessor's integrated spreadsheet, importing data is a snap. You can paste data from the Clipboard, read it from a text file, or drag and drop it from other applications. Charts Pro instantly translates your data into a bar graph using one of three basic color schemes. But you're not limited to this default bar chart; you can choose from 22 additional styles, including line, pie, and 3-D surface charts.

You can apply colors, textures, or images to any of a chart's major graphical elements, since the program supports many popular image-file formats, including Adobe Photoshop, PICT, and JPEG. For added punch, you can replace the data markers with 3-D objects in 3DMF format. And if you've got a hefty amount of RAM, you can create dynamic presentations by applying QuickTime movies to data markers.



Picture Perfect Add pictures to columns using Charts Pro 1.0.

Charts Pro sports several tools that you'd expect to find in a 3-D design application—you can rotate, zoom, or translate a chart, and you can even specify the location and field of view. Five external light sources create an endless variety of dramatic effects. And if you have a QuickDraw 3-D–accelerator card installed, your changes update on the fly. When you're done, you can render and export your work in a variety of formats. You can even animate your chart by rotating it on the *x*, *y*, or *z* axis and then saving the spinning chart as a QuickTime movie. Charts Pro also supports an extensive vocabulary of AppleScript commands that allow you to generate charts automatically.

For an application with this much graphics prowess, Charts Pro offers limited text handling. For example, you can rotate text, but only in 90-degree increments, and there are no provisions for text animation or other special effects. If you do hit snags in the program, the amply illustrated documentation provides helpful pointers.

Macworld's Buying Advice For anyone who's looking to display numbers and graphs creatively, look no further than Charts Pro 1.0.—FRANKLIN TESSLER

RATING: ❚❚❚❚ **PROS:** Stunning 3-D effects; easy to use. **CONS:** Limited text capabilities. **COMPANY:** Adrenaline Software (418/658-9909, www.chartspro.com). **LIST PRICE:** $399.

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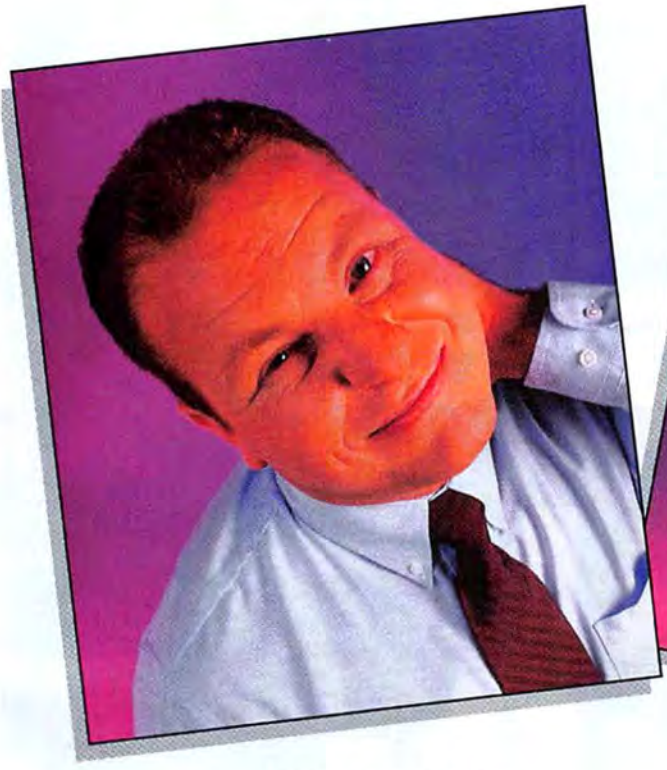

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Born-Again Macs

Put New Life into Your Old Mac with Ultrafast G3 Upgrade Cards

YOU MAY NOT WANT TO ADMIT IT, but your beloved Power Mac—the one that was absolutely screaming-fast when you bought it a few years ago—is starting to look a little shabby. Even if you've kept its case free from grime, you can't deny that the PowerPC 604 processor inside is getting long in the tooth by computer-industry standards. Buy a Mac one day, and it's obsolete the next—right?

Not anymore.

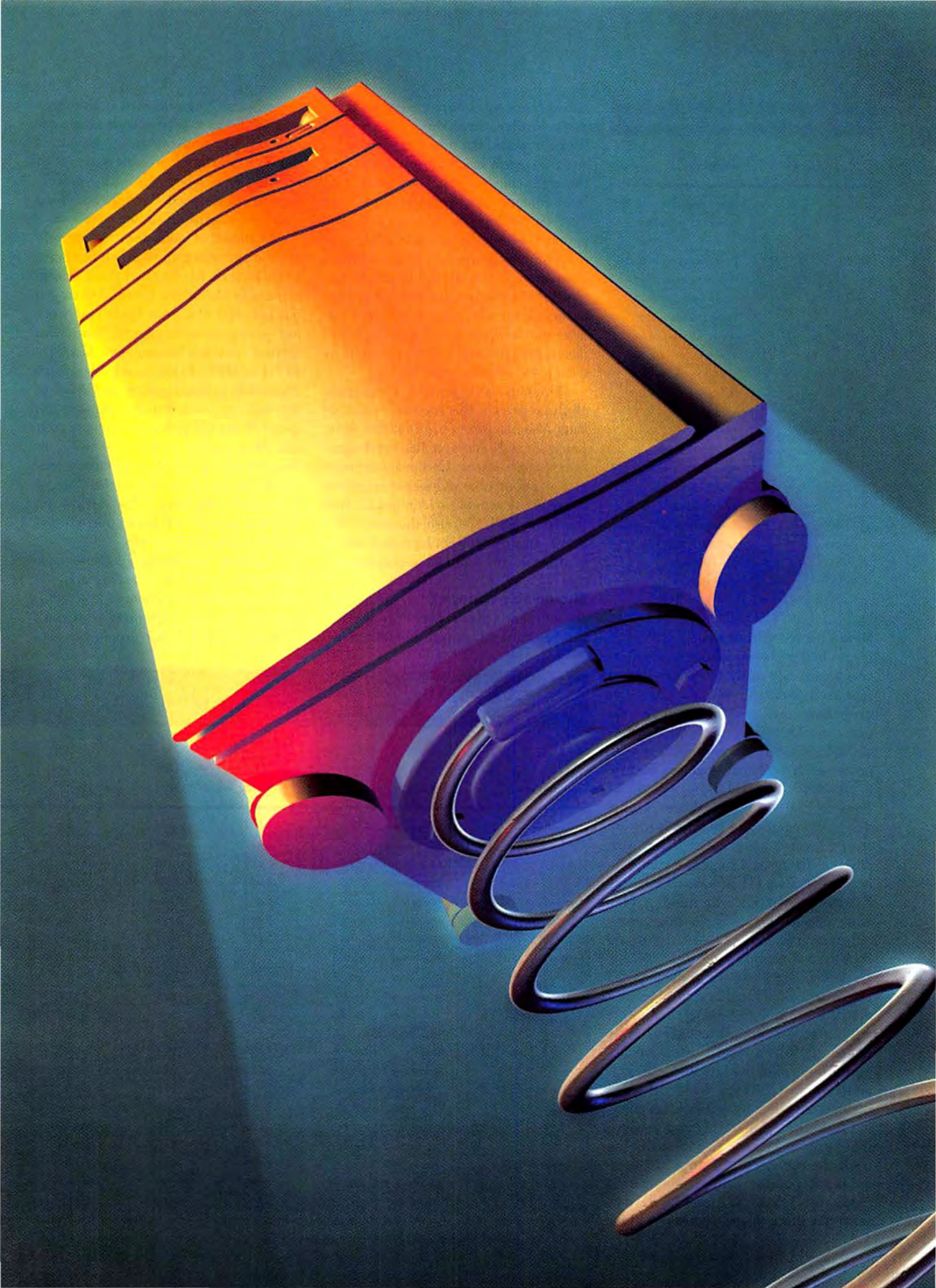
On most PCI-based Power Macs, that old PowerPC 604 processor sits on a removable card. Replace that card with one that houses a modern G3 processor, and you'll make your Mac young again. The last time we looked at these upgrade cards, they were relatively new on the market and were both quirky and costly (see "Quantum Leap," July 1998). But these days, G3 upgrade cards have come of age. They're faster, more stable, and much more affordable than they were just a few months ago.

To get the details about just how much of a speed boost an upgrade card can give your Mac, Macworld Lab tested 20 upgrade cards ranging in speed from 300MHz to 400MHz and found impressive performance boosts and some remarkable bargains.

So don't feel bad about that old Mac you're using. It's about to get a new spring in its step.

BY CAMERON CROTTY

HENK DAWSON



Processor-Slot–Upgradable Macs

Company	Model
Apple Computer	Power Macintosh 7300
	Power Macintosh 7500
	Power Macintosh 7600
	Power Macintosh 8500
	Power Macintosh 8515
	Power Macintosh 8600
	Power Macintosh 9500
	Power Macintosh 9515
	Power Macintosh 9600
	Workgroup Server 7350
	Workgroup Server 8550
	Workgroup Server 9650
DayStar Digital	Genesis series
Power Computing	PowerCenter series
	PowerCurve series
	PowerTower series
	PowerTower Pro series
	PowerWave series
UMAX	SuperMac J700
	SuperMac S900
	SuperMac S910

New Life for Old Macs

Upgrading a Mac by adding a new processor card isn't really a new idea—Macs that are upgradable via new processor cards have been around for some time (see the table "Processor-Slot–Upgradable Macs"). But it wasn't until the G3 processor arrived that upgrades became a big deal. The G3 (also called the PowerPC 750) is the first PowerPC chip designed specifically to work with the strengths and weaknesses of the Mac OS—resulting in a huge difference in performance. A G3 processor is clearly faster than a 604 processor running at the same megahertz, and as new chips come out, the speed of the G3 keeps growing by leaps and bounds.

When *Macworld* last looked at G3 upgrade cards, 333MHz chips were just on the horizon. Now 400MHz chips are all the rage, with even faster ones to come. Benefiting from a copper-based production process pioneered by IBM, this new generation of ultrafast G3's can run at high speeds while using much less energy. The result: A 400MHz card dropped into a standard Power Mac 9500/132 can triple that vintage Mac's speed.

In the Details Transforming an old Macintosh into a G3 powerhouse may seem like black magic, so here's a quick refresher on some basic concepts. Upgrade cards involve three different parts of your computer: the processor, the cache, and the system bus. The processor—the PowerPC chip—is your Mac's brain. This brain communicates with the rest of your Mac—including the RAM, ROM, and peripherals—via the system bus. The processor stores frequently used software instructions in the cache, a block of high-speed RAM, where those instructions can be accessed much more quickly (at a rate determined by the speed of the *cache bus*) than if the processor had to retrieve them from RAM via the system bus.

Upgrade cards work by accelerating all three parts of this hardware relationship. Manufacturers begin with a faster processor and add a speedier—and sometimes larger—cache. Card manufacturers also add controller chips that accelerate the entire system bus to run in tune with the faster CPU. Mount the new CPU, cache, and controller chips on a circuit board, and you've got an upgrade card.

Should You Convert?

So you want a faster Mac. Who doesn't? But before you buy, you should consider if buying an upgrade card is the right decision for your particular situation.

Of course, buying an upgrade card should always be a less costly option than buying a new Power Mac with a processor of the same speed. But price and speed aren't the only factors in the equation.

Deathbed Conversions Upgrade cards are great at giving current hardware a new lease on life, but they don't *actually* make your Mac a new system. When you buy a new G3 Mac from Apple, you're not just getting more megahertz. You're also getting the latest technology—fast CD-ROM or DVD-ROM drives, faster hard drives with greater capacity, and a slew of internal improvements that enhance the speed of the G3 processor in ways your old Mac simply can't. (For ways of improving your old Mac beyond upgrading the processor, see the sidebar "Megahertz Isn't Everything.") And if you buy a new Mac, you'll still have your old system to use somewhere else.

Software compatibility is also a major issue when it comes to buying upgrade cards—just ask the owners of PowerPC-upgrade–equipped Quadras who can't switch to Mac OS 8.5. Apple has also

20 G3 Speed Demons

Company	Product	Mouse Rating	List Price	Phone
Mactell	G3 PowerJolt 366/244	●●●	$1,175	512/323-6000
	G3 PowerJolt 333/222	●●●	$995	512/323-6000
	G3 PowerJolt 300/300	●●½	$1,195	512/323-6000
	G3 PowerJolt 300/200	●●●½	$789	512/323-6000
Newer Technology	Maxpowr G3 400/200	NA^	$1,649	316/943-0222
	Maxpowr G3 333/166	●●●½	$1,049	316/943-0222
	Maxpowr G3 300/150	●●●●	$749	316/943-0222
PowerLogix	PowerForce G3 400/200	NA^	$1,399	512/795-2978
	PowerForce G3 366/183	NA^	$1,099	512/795-2978
	PowerForce G3 333/166	●●●●	$899	512/795-2978
	PowerForce G3 300/300	●●●½	$799	512/795-2978
	EDITORS' CHOICE			
	PowerForce G3 300/150	●●●●	$599	512/795-2978
	PowerForce G3 300/120	●●●●	$499	512/795-2978
Sonnet Technologies	Crescendo G3 400/200	●●½	$2,000	949/261-2800
	Crescendo G3 366/183	●●●	$1,200	949/261-2800
	Crescendo G3 333/166	●●●	$1,000	949/261-2800
	Crescendo G3 300/150	●●●½	$700	949/261-2800
Vimage	Vpower 300/150	●●●½	$798	877/484-6243
XLR8	Mach Speed G3 400/200	●●½	$1,849	316/636-5544
	Mach Speed G3 333/166	●●½	$1,299	316/636-5544

NA = not applicable. ^Product was not shipping to customers at press time.

refused to guarantee that Mac OS X will run on any Mac not originally based on the G3 chip. If you're counting on running that version of the Mac OS once it's available, in a year or so, don't count on using an upgraded Mac to do so.

On the other hand, speed *now* may be all that matters to you. After all, by the time Mac OS X is released, even today's Power Mac G3's may be considered slowpokes. If so, buying a G3 upgrade card now might give you enough speed to hold off on buying a new Mac until OS X appears.

Protecting Your Flock

Perhaps the most important technical issue that you need to weigh when deciding between an upgrade card and a new system is reliability. It doesn't matter how much time a faster Mac will save you if you end up wasting that time rebooting or troubleshooting.

The good news is that upgrade-card manufacturers have gotten a lot better at producing easy-to-install cards. Although the physical installation process has always been fairly straightforward (see the sidebar "Brain Transplant, Not Brain Surgery"), the last time we tested upgrade cards, we had to jump through flaming compatibility hoops to get several of them to work properly.

This time around, our testing went more smoothly than ever before. We installed each card and its accompanying software without a fuss, and our upgraded Power Mac 9500 ran all our performance tests with nary a hitch. However, there still appear to be some incompatibilities between certain upgrade cards and particular products, especially peripheral cards such as Adaptec's SCSI cards and Dantz Development's Retrospect backup software. Macworld Lab attempted to replicate these incompatibilities by running a 300MB backup session with Retrospect. When we used internal SCSI, all the cards functioned normally. But when we used Adaptec's AHA-2940 Ultra Wide SCSI card, only upgrade cards from Newer and Vimage completed the backup successfully.

The good news is that upgrade-card manufacturers have gotten a lot better at producing easy-to-install cards.

Resist Temptation Another issue that can affect your souped-up computer's stability is *overclocking*—pushing the processor on an upgrade card to faster than its rated speed. By using the switches found on many of these cards, it's possible to increase the chip and system-bus speeds until a 366MHz card—for instance—runs at 375MHz. Card manufacturers have often held this option out to users, all the while disclaiming responsibility for data loss or compatibility problems.

We can't stress this enough: Don't give in to the temptation to overclock. Computer components come with built-in margins of safe operation, and overclocking pushes your system right up to the edge of those margins. Overclocking may make you feel like you're getting something for nothing, but the resulting performance increases are usually only about 5 to 10 percent. Is that extra fraction of speed worth risking irreplaceable creative efforts or your family's or business's financial data?

Cards in the Crucible

Macworld Lab tested 20 cards from six companies: Mactell (www.mactell.com), Newer Technology (www.newertech.com), PowerLogix (www.powerlogix.com), Sonnet Technologies (www.sonnettech.com), Vimage (www.vimagestore.com), and XLR8 (www.xlr8.com).

As usual, Newer Technology emerged as the 800-pound gorilla of the accelerator-card field (see the benchmark, "400MHz and Climbing"). At most speed levels, this company's Maxpowr G3 cards are faster than their competitors. And Newer's software and documentation set the standard for the industry. The cards also appear to be free of the compatibility problems that affect some other companies' cards, thanks to a built-in hardware-based fix. Perhaps as a result of such diligence, Maxpowr cards tend to cost more than the competition—but the peace of mind they provide may be worth it.

CPU Speed	Cache-Bus Speed	Cache Size	Comments
366MHz	244MHz	1MB	Faster cache doesn't necessarily mean faster card.
333MHz	222MHz	1MB	Not the fastest card, but competitively priced.
300MHz	300MHz	1MB	300MHz cache-bus speed not worth the price.
300MHz	200MHz	1MB	Good performer, good price.
400MHz	200MHz	1MB	Fastest card of the lot, but quite expensive.
333MHz	166MHz	1MB	Quality card, but not inexpensive.
300MHz	150MHz	512K	Good performance despite small cache.
400MHz	200MHz	1MB	Least expensive of the 400MHz cards.
366MHz	183MHz	1MB	Equivalent to Mactell's G3 PowerJolt 366/244.
333MHz	166MHz	1MB	Good value, and speedy card.
300MHz	300MHz	1MB	Much better value than Mactell's 300/300 card.
300MHz	150MHz	1MB	Slower bus speed, but a great value.
300MHz	120MHz	512K	Slowest of the cards we tested, but an impressive value.
400MHz	200MHz	1MB	Disappointing performance at a high price.
366MHz	183MHz	1MB	Slower than Mactell's 366/244 card.
333MHz	166MHz	1MB	Not enough performance for the price.
300MHz	150MHz	1MB	Good value, but not as good as PowerLogix's 300/150.
300MHz	150MHz	1MB	Solid card from newcomer to the field.
400MHz	200MHz	1MB	Beaten in price by PowerLogix's 400MHz card.
333MHz	166MHz	1MB	Most expensive of the 333MHz cards.

When it comes to getting bang for your buck, it's hard to argue with the price and performance of PowerLogix's PowerForce G3 cards. These cards are among the fastest at every chip-speed level, and their prices are quite competitive. PowerLogix's PowerForce G3 300/120 card—although it has only a 512K cache—offers the best value of any card we tested. The PowerForce package has remained largely unchanged since our last roundup, with the exception of an extra DIP switch on the cards themselves. The cards could also use better documentation.

Other companies' cards were less impressive: XLR8's cards are based on PowerLogix's designs, but the Mach Speed G3 boards didn't fare as well in terms of price and performance. Some of Mactell's cards come with extra fans—a nonessential extra (unless you ignore our advice and overclock the processor), and to install the fan, you've got to connect a separate power line to your Mac's motherboard. Mactell's cards, with the exception of the G3 PowerJolt 300/300, hold up fairly well in terms of price and performance, but the company offers mediocre documentation.

Megahertz Isn't Everything

INSTALLING A G3 PROCESSOR IN YOUR OLD MAC WILL CERTAINLY ADD POP TO YOUR PROCESSING. BUT ALTHOUGH IT'S THE MOST DRAMATIC ENHANCEMENT YOU CAN CURRENTLY MAKE TO YOUR MAC, IT'S ONLY ONE OF THE IMPROVEMENTS THAT CAN MAKE YOUR OLD MAC FEEL YOUNG.

In fact, you may not be able to make the most of that new G3 processor if the rest of your system is still factory-issue. For a few dollars more, you can squeeze better performance out of your Power Mac by adding these simple upgrades.

Hard Drive How quickly applications launch, windows and documents open, and documents are saved depends not only on your processor but also on the speed of your hard drive. The faster your hard drive, the more quickly these operations occur. In fact, a G3 upgrade in an extremely old Power Mac may be severely hampered by a slow hard drive, with the processor having to constantly wait for the hard drive to catch up to it.

SCSI drives come in a variety of speeds. Slower drives run at 5,400 rpm. Faster, AV drives operate at 7,200 rpm and higher. Adding one of these faster drives to your Mac will increase overall performance.

Also, most midrange-to–high-end Power Macs—the 7300, 7500, 7600, 8100, 8500, 8600, 9500, 9600, and many 604- and 604e-based clones—have an internal SCSI-2 bus and an external SCSI-1 connection. Macs with internal SCSI-2 offer a transfer rate of 10 MBps, compared to the 5 MBps transfer rate of Macs with SCSI-1. If you plan to add a hard drive to one of the former, consider an additional internal SCSI-2 drive that takes advantage of the faster bus.

RAM In and of itself, RAM doesn't speed up your Mac. In most cases, for example, having 64MB of RAM won't make Microsoft Word run any faster than if you had 32MB of RAM. However, there are some areas where additional RAM can be of assistance.

Adobe Photoshop first processes and stores images in RAM. When it runs out of RAM, it stores information on your hard disk. Because your machine can transfer information into and out of RAM much more quickly than it can to and from a hard disk, it's a good idea to have as much of this information stored in RAM as possible. More RAM equals more RAM storage, which leads to much faster Photoshop processing.

Apple's virtual memory and Connectix's RAM Doubler may be modern miracles, but they don't offer the greatest speed. As with Photoshop, if you can store information in RAM rather than virtual memory, your Mac will be more responsive.

CD-ROM Drive Through the years, you've seen CD-ROM speeds increase from 2× to 4× to 16× to 24×. But do these increases in speed really make your Mac faster? If your current drive is only 2× or 4×, you'll notice a difference by upgrading to a new CD-ROM (or DVD-ROM) drive—QuickTime movies won't skip frames or drop their audio tracks. But if you already have an 8× CD-ROM drive, making the move to 24× isn't going to radically transform your CD-ROM experience. The main advantage of having a fast CD-ROM drive is that you can copy data from a CD-ROM disc to your Mac more quickly, a boon if you tend to install a lot of software or routinely copy large chunks of data from disc to disk.

Faster SCSI Although adding an internal SCSI-2 drive to your Power Mac provides you with sprightlier data-transfer rates, there are a few limitations. Your Mac has only so much space for internal devices, and your external devices are limited by the slower external bus. To get truly fast external SCSI, add a fast SCSI card to your PCI Mac. Adaptec's PowerDomain series of PCI SCSI cards, for example, provides transfer rates of up to 40 MBps—four times the transfer rate of SCSI-2. Some of these cards also allow you to attach more than seven SCSI devices to your Mac. (But you should be wary of potential incompatibilities between some G3 upgrade cards and fast peripheral devices such as SCSI cards.)

Video Card An accelerated video card can dramatically increase display speeds on your monitor. Many of these video cards not only speed up screen redraws and offer greater color depth and resolution but also accelerate QuickTime playback and provide smoother 3-D–graphics display. These video cards usually carry between 4MB and 8MB of memory.

If you're a gamer and wish to boost the speed of such games as MacSoft's Quake and Unreal, which support 3-D–acceleration hardware, you can add a video card that additionally supports this kind of acceleration. Micro Conversions' Game Wizard and ATI's Xclaim VR support the two competing acceleration standards: Glide and RAVE, respectively.—CHRISTOPHER BREEN

Newcomer Vimage also places a fan on its cleanly designed 300MHz board, but in contrast to Mactell, Vimage replaces the gigantic heat sink typically found on Mac processor cards and designs its card to draw power directly through the processor slot. Regardless of this innovation, Vimage's Vpower offers only average performance and value.

Sonnet Technologies has revised its manual since our last tests, and the new documentation is much improved. Unfortunately we can't say the same thing for the company's hardware. Sonnet's Crescendo G3 boards landed at or near the bottom of every performance test, and their prices were about average. However, Sonnet was the only company other than Newer to directly address incompatibility issues—in its case, with a software fix.

Macworld's Buying Advice

If there's anything we learned from our revisiting of G3 upgrade cards, it's this: The fastest available upgrade cards are always too expensive for most users. The slower the card, the better the value.

Only the most dedicated speed freaks should even consider 400MHz processors. Unless you simply can't upgrade to a Power Mac G3 for com-

Macworld LAB TEST

400MHz and Climbing

If speed means everything to you, then Newer Technology's 400MHz Maxpowr G3 upgrade card is the clear winner. However, the upgrade world is governed by the law of diminishing returns: as cards increase in speed, they get exponentially more expensive. Above 333MHz, speed gains are outweighed by price. PowerLogix's 300MHz PowerForce G3 card with a cache speed of 120MHz was clearly the slowest card we tested—slightly slower than a new Power Mac G3/266—but it was also the best value.

Best results in red. *Reference systems in italics.* **SpeedMark scores are relative to that of a Power Mac 7100/80, which is assigned a score of 1.0. MacBench 5.0 scores are relative to those of a Power Mac G3/300, which is assigned a score of 1,000 for each test.**

	SPEEDMARK	MACBENCH 5.0	
	Overall Performance	Processor	Graphics
Newer Maxpowr G3 400/200	5.9	1,336	1,620
PowerLogix PowerForce G3 400/200	5.6	1,323	1,649
XLR8 Mach Speed G3 400/200	5.6	1,322	1,578
Sonnet Crescendo G3 400/200	5.5	1,316	1,470
Mactell G3 PowerJolt 366/244	5.4	1,260	1,545
PowerLogix PowerForce G3 366/183	5.4	1,212	1,621
Sonnet Crescendo G3 366/183	5.2	1,209	1,398
Newer Maxpowr G3 333/166	5.1	1,108	1,472
PowerLogix PowerForce G3 333/166	5.1	1,103	1,509
Mactell G3 PowerJolt 333/222	5.0	1,137	1,487
XLR8 Mach Speed G3 333/166	5.0	1,104	1,436
Sonnet Crescendo G3 333/166	4.8	1,093	1,394
Mactell G3 PowerJolt 300/300	4.8	1,102	1,526
Mactell G3 PowerJolt 300/200	4.7	1,028	1,434
PowerLogix PowerForce G3 300/300	4.7	1,098	1,400
Newer Maxpowr G3 300/150	4.6	896	1,412
★ PowerLogix PowerForce G3 300/150	4.6	988	1,332
Vimage Vpower 300/150	4.6	986	1,423
Sonnet Crescendo G3 300/150	4.5	989	1,327
PowerLogix PowerForce G3 300/120	4.2	843	1,303
*Apple Power Macintosh G3/300**	5.2	1,002	1,390
Apple Power Macintosh G3/266	4.4	834	1,363
Apple Power Macintosh 9500 with Newer Maxpowr G3 250/125	4.0	751	1,310
Apple Power Macintosh 9500/132	1.9	285	784

Longer bars are better.

★ = EDITORS' CHOICE *Tested system differed from MacBench reference system in OS version, screen resolution, and hard drive.

Behind Our Tests

We tested all the upgrade cards in a Power Macintosh 9500 with 64MB of RAM and a 512K disk cache, running Mac OS 8.1. All displays were set to 24-bit color at 832-by-624-pixel resolution. *Macworld*'s SpeedMark test suite runs 54 real-world tasks in 15 programs and the Finder to determine overall performance of a Mac. The Ziff-Davis Benchmark Operation's MacBench 5.0 uses special test programs tuned to measure and isolate the performance of the processor, disk, and graphics subsystems. (Download your own free copy of MacBench 5.0 from www.macbench.com.)—**Macworld Lab testing supervised by Gil Loyola**

Brain Transplant, Not Brain Surgery

UPGRADING YOUR MAC IS A DO-IT-YOURSELFER'S DREAM: THE MATERIALS ARE RELATIVELY INEXPENSIVE, AND THE PROCEDURE IS SIMPLE. HERE ARE A FEW TIPS TO HELP YOU ALONG THE WAY.

Preparation The most important hardware components are your Mac (unplugged) and your upgrade card. Don't take the card out of the bag before you put on a static-grounding strap, a device you wear on your hand to protect the card from static-electricity damage. If your card doesn't come with one, buy one. A small screwdriver may also come in handy. On the software side, you'll need the disk that came with your upgrade card.

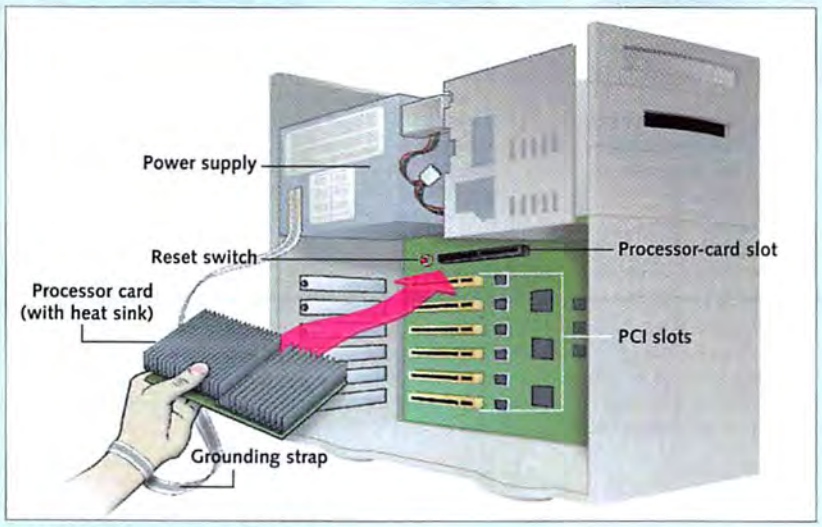
Once you have your equipment in place, prepare yourself for the installation by carefully reading the manual—*the whole thing*. Many companies provide helpful illustrations or pictures that clarify the installation process. Don't risk damaging your computer or card by skipping the manual and trying to figure out the process on the fly.

Software Before you start unplugging your computer, be sure to install the software that came with your card. If you don't do this up front, you may have trouble later—your upgraded Mac might not boot without the proper software in place.

Old Card Once you are properly grounded, you can open your Mac (following the instructions in the upgrade-card manual). The processor card's location varies depending on what system you have, but the card's size and shape are always the same. The card is 3 inches high and is plugged into a slot near the center of the motherboard, covered by a bulky metal attachment called a heat sink, which aids in keeping the processor cool.

New Card Now you can take your new processor card out of its anti-static bag and install it. The edge of the card should have a notch for proper alignment. Pop the card into the slot gently—don't ever force it. Be sure that the card seats evenly all the way into the slot, covering the gold edge contacts.

Reset Switch After you have installed your new processor card, look on the motherboard for a small circular button in a square housing—it's the processor-reset switch, and it should be near one of the ends of the processor slot. Press the button, and hold it for a few seconds. (When you reboot, your Macintosh clock will need to be reset—that's the price of upgrading.) Then close your Mac, hook it back up, and boot up your new G3 Power Mac.



ARNE HURTY

patibility reasons, spending $2,000 instead on a 400MHz upgrade card doesn't make sense. If you're not saddled with compatibility concerns, you're better off spending a few hundred dollars more and buying a speedy new Mac. Even the 366MHz cards we tested are just too expensive for us to recommend to most users.

However, neither do we recommend that you rush out to buy a 220MHz upgrade card. Although such a card would provide a sure speed boost, the result would still be a Mac that's slower than any current Power Mac G3. Instead, consider a low-cost 300MHz or 333MHz card.

PowerLogix's PowerForce G3 300/150 offers good speed at a price comparable to that of 250MHz G3 upgrade cards on the market. When we went to press, it was clearly the best buy of the bunch. But beware—the price of upgrade cards is extremely volatile. Smart buyers will want to visit the Web sites of all the companies whose cards we tested to find the latest prices immediately before buying.

No matter what reason you have for speeding up that old Mac of yours, the good news is this: You can breathe new life into your old Mac for a reasonable price. Gone are the days when you bought a computer and then stood helplessly by as it aged and became obsolete. Thanks to the latest crop of fast and affordable G3 upgrade cards, your old Mac might just have a new lease on life. **m**

Freelance technology journalist CAMERON CROTTY is a former *Macworld* editor and longtime *Macworld* contributor.

EDITORS' CHOICE

♦♦♦♦ **PowerLogix PowerForce G3 300/150**
This solid 300MHz upgrade card was the best value at press time—but since upgrade-card prices are so volatile, be sure to check current prices before you buy. **Company:** PowerLogix (512/795-2978, www.powerlogix.com). **List price:** $599.

REAL PRODUCTS REAL RATINGS

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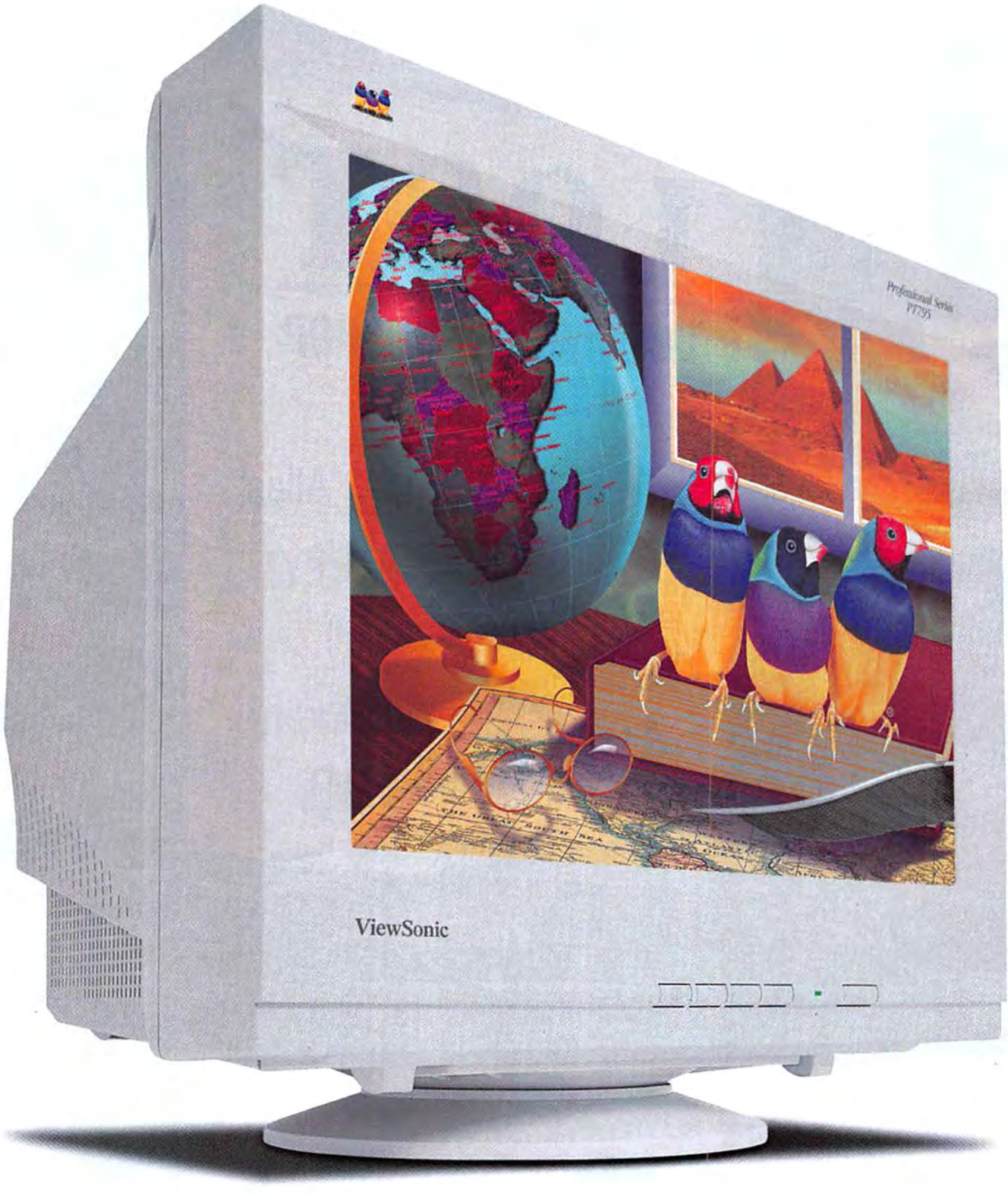

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ILLUSTRATION'S GOLDEN AGE

Three Outstanding Drawing Programs Put Power in the Hands of Mac Artists

by Deke McClelland

AS COMPUTER ARTISTS, IT SEEMS LIKE we're forever on a treadmill—once you become comfortable with one version of a program, another hits the streets. These days, the average time between upgrades is about *15 months*. In this climate, if a company has the gall to issue an upgrade—and expect us to buy it—that upgrade had better be good.

That's why the newest update frenzy is so impressive. Adobe Illustrator 8.0 (www.adobe.com) returns to its glory days as a streamlined, feature-rich standard-bearer. CorelDraw 8.0.1 (www.corel.com) performs an even more amazing trick, rising like a phoenix from the smoking husk of the roundly dismissed version 6. A third upgrade, Macromedia FreeHand 8.0.1 (www.macromedia.com), is the most modest, but its predecessor, FreeHand 7, was so far ahead of the pack that the new version still comes out smelling like a rose.

The secret behind the success of the version 8 upgrades is imitation. Each of these drawing programs offers exciting new features that were either borrowed from competitors or inspired by different graphics programs. The result is a trio of drawing doppelgängers—each has its special strengths, but if all you care about is having *a lot* of great features, then they all fit the bill.

JEFFREY PELO

That's why we dug a little deeper to examine not only whether these programs have particular features but also—if so—how well those features perform and how easy they are to use.

To do this, we gave key features a grade on a scale from A to F, with A, of course, being best. (See the table, "Illustrious Implementations," for the winners in each category, and go to www.macworld.com/more/ for the complete report card with comments.) We also hired three artists to test drive the new applications and report back some findings and we compiled lists of the top five tasks that each program performs better than the rest (see the "Five Tasks" sidebars throughout this article). The result is a comprehensive picture of three closely matched rivals and a clear ruling on the one program that gets it right most often.

Interface and Compatibility

Every graphics program is like a room in a big studio. If you're comfortable working in the environment that the software provides, you can accomplish anything. If not, no matter how well the tools work, your creativity will be stymied.

Likewise, you need to be able to move freely throughout the studio—from your drawing program to Adobe Photoshop, for example. If you can exchange files easily, as well as open old files and integrate them into new artwork, you'll save time.

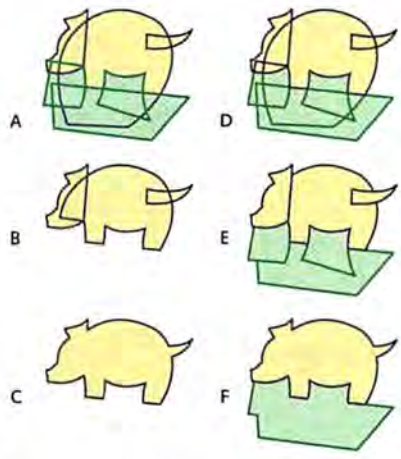
New Order Say what you will about Adobe's efforts to make all its applications' interfaces consistent—in return for the sometimes confusing changes Illustrator has undergone, the program now has the most straightforward working environment in the business.

Illustrator 8.0 frees up screen space by aligning palettes in an orderly column along the window's right side. It colorizes selection outlines by layer, so you always know where you are. It provides on-screen hints telling you which key to press to get any tool. It also hides interface elements at the touch of the tab key, leaving just you and the illustration, artist to artwork.

Illustrator also now opens FreeHand and CorelDraw files, so your artistic experience isn't interrupted by technical difficulties. As always, Illustrator also opens and saves native and EPS files that have been saved in any previous version of the program—a claim to backward compatibility that neither FreeHand nor CorelDraw can make.

Customizable Disorder When compared with Illustrator 8.0's orderly atmosphere, FreeHand 8.0.1's interface is best described as unkempt. Unless you have a second monitor, mismatched palettes either overlap or obscure your view of the illustration window. Granted, you can collapse the palettes you aren't using, but it's far easier to pile them up in a heap.

FreeHand is not without its advantages over Illustrator—which include smoother scrolling, faster screen redraws, and more opportunities for customizing the interface. However, there's no full-screen drawing mode; no graphic navigator; and no helpful hints built into the default tool shortcuts, which include such oddities as pressing F10 for the scale tool (you can choose to use built-in Illustrator or CorelDraw shortcuts, though).



Plentiful Pathfinder Illustrator 8.0 offers more ways to combine paths than any other program. For example, starting with some simple shapes (**A**), you can make a pig by subtracting the green ones (**B**) and then uniting the yellow ones (**C**). Alternatively, you can divide (**D**), trim (**E**), or merge (**F**) the original shapes to achieve other effects.

FreeHand does a great job of opening Illustrator artwork but has problems with FreeHand 2 files and can't even see FreeHand 1 files. As a result, I have a drawer full of floppies with FreeHand files that I can't open with this version—and you may, too.

Strange Ways CorelDraw 8.0.1 presents a more streamlined front than FreeHand 8.0.1, with regularly sized palettes and a context-sensitive Properties bar that changes to suit the selected object. It also offers the most extreme zoom range, from 1 percent to several thousand times normal size, for when you need to be *really* precise.

If you've spent any time in Illustrator or FreeHand, however, using CorelDraw feels like a trip to a foreign country. I've been using CorelDraw since version 1, yet I still shudder at anchor points called "nodes," masking called "power clipping," and the common arrow unpleasantly labeled the Pick tool.

There are also inconvenient aspects to the interface. There's no shortcut for the hand (or Pan) tool, although you can scroll by pressing option while using the arrow keys. You can hide all interface elements by pressing F9, but you can't do anything *with* your artwork until you press the esc key to bring back the clutter. CorelDraw 8's interface is original, but there's work to be done before it will bridge the gap with Mac professionals.

■ **Interface/Compatibility Champ:** *Illustrator 8.0*

Drawing and Editing

Once the exclusive domain of Illustrator, drawing and editing is now handled competently by all three applications. This is a good thing, since drawing *is* the central capability of a drawing program.

All three programs let you draw and edit complex paths, automatically trace scanned line art, and establish custom guidelines that apply order to even the most sophisticated illustrations. That said, each program has strengths that suit specific kinds of artists—with Illustrator focusing on precision drawing, FreeHand on tracing, and CorelDraw on plans and schematics.

Precise Power Despite its competitors' improvements, Illustrator still dominates in a few areas. Its geometric-shape tools can't be beat, letting you draw, move, and edit shapes on the fly so that you get them right the first time. The pen tool is now smarter, permitting you to add and subtract points without switching tools or pressing keys. Illustrator 8's numerous path operations are conveniently collected in a single palette. Timesaving smart guides ensure that your straight lines are absolutely straight and in line with every other path in your drawing.

The one continuing failure of Illustrator 8 in this category is the pro-

JOHN RITTER

On the Road: Illustrator Artist John Ritter usually sticks to pens, paint, and Adobe Photoshop. After experimenting with Illustrator 8.0 to make this drawing, however, he was pleasantly surprised. "It took me awhile to get the hang of it," he said, "but once I did, I was amazed by all I could do." Ritter was particularly impressed by Illustrator 8's new Gradient Mesh tool, which let him blend multiple colors in different directions within the same object. He used it to quickly create complex shading that would normally require a trip to Photoshop, such as those in the rider's helmet and arms.

1. **Combine paths.** No program lets you make complex paths out of simple ones like Illustrator. FreeHand and CorelDraw let you unite paths, find the intersection, and punch out holes. But only Illustrator lets you exclude intersections, merge all similarly filled paths, crop, trap, and more.

2. **Create brushstrokes.** Illustrator 8 lets you attach any collection of objects to a curve. The result is undulating artwork, wavy type, and traditional-looking brushstrokes. The effects are live—just edit the path and the brushstroke changes with it.

3. **Mask objects.** Unlike FreeHand, Illustrator lets you mask objects with editable text. Unlike CorelDraw, it lets you edit the contents of a mask without hiding everything else on the page. It offers the best of both worlds.

4. **Draw geometric shapes.** Illustrator is known for its free-form curves, but even more impressive are its geometric shapes. While you draw, you can change the number of sides on a polygon, increase the pointiness of a star, and move an ellipse to get it exactly in place.

5. **Trade artwork with Photoshop.** Drag and drop clipping paths between the two programs, calibrate the programs (using shared ColorSync profiles), and export Illustrator artwork to the Photoshop format with all layers intact.

gram's Stone Age autotrace tool, which traces only one path at a time, and does so badly. If tracing is important to you, purchase a dedicated program such as the $199 Adobe Streamline. Better yet, get FreeHand instead.

Efficient Flexibility Despite Illustrator's popularity among working artists, FreeHand is every bit as good at drawing and editing and includes some true time-savers to boot. For example, where Illustrator makes you trace one path at a time and CorelDraw makes you launch a separate program (CorelTrace) if you're doing complex tracing, FreeHand alone can automatically draw hundreds of paths anytime you draw a marquee around a bitmapped image with the tracing tool.

FreeHand likewise expedites the selection of objects, so you can quickly access any shape you want to edit and even replace all occurrences of it globally. I'm not a fan of how FreeHand makes you regularly press tab to deselect objects before making a new selection, but the ability to select down a stack of overlapping objects by control-clicking still beats what you can do in Illustrator.

FreeHand also offers a welcome break to artists who simply want to *draw*. If you're tired of editing paths by pulling on little control handles, FreeHand's Freeform tool will offer some relief—it lets you mold outlines by brushing up against them.

Schematic Standout CorelDraw's drawing features take some getting used to, but ultimately they make sense. For example, to edit points, you use a dedicated reshape tool or click on buttons on the Properties bar. Illustrator and FreeHand provide more-dynamic controls, but the advantage of CorelDraw's approach is that it's easy for novices to learn.

Where the program really distinguishes itself is in schematic drawing. It lets you specify a scale of measurement—say, 0.25 inch equals 1 foot—essential

when drawing plans or schematics. You can then use the Dimension tool to automatically label the length of line segments according to your scale. This feature—inexplicably missing from both Illustrator and FreeHand—makes CorelDraw an appealing option for artists who do a lot of technical or architectural illustrations.

■ **Drawing/Editing Champ:** *Three-way tie*

Transformations, Masks, and Blends

When you're creating professional-level artwork, it's not enough to just push around your polygons. The next stage of creating and editing your artwork involves using three very practical effects—transformations, masks, and blends.

Simple Convenience The most commonly used transformation is scaling. Illustrator 8 lets you increase or decrease an object's size by simply dragging a corner handle. However, this may hamper your ability to snap objects into alignment—for example, when attempting to align the corner of one shape to another—so if you don't like the feature, turn it off.

Illustrator's Transformation palette is unequaled for convenience. It puts scale, rotate, and skew options with a center-point control in a single location. The program lets you apply editable type as a mask as well as blend between any two shapes

Power Duplication Repeating transformations has long been one of FreeHand's strengths. After rotating, scaling, and skewing a clone of a small pig outline in FreeHand 8.0.1, I simply pressed ⌘-D to repeat the transformations, resulting in a spiral of pigs.

filled with any number of colors. Finally, you can also *edit* blends dynamically.

The bad news is that you can repeat just one transformation at a time, which means you can't rotate and scale in one duplication when you want to create, say, a pattern of objects spiraling toward the viewer. If you managed to put up with Illustrator back before live blends, however, this is probably small potatoes.

Uneven Abilities FreeHand loses points in this category for its lack of distortion capabilities, its poor enveloping feature, and its inability to blend between two gradations unless they contain exactly the same number of colors.

On the other hand, FreeHand's mask-editing functions are every bit as good as Illustrator's, and FreeHand lets you repeat a long series of transformations to quickly create swirling tailspin patterns that simply aren't possible with blends. FreeHand's transformation effects also have some efficient touches. For example, you can double-click on an object to quickly toggle between scale and rotate modes.

Erratic Rewards You can do the same in CorelDraw, but the program suffers from disorienting inconsistencies. For example, to scale height and width *disproportionally* in one operation, you must press the shift key while dragging. But if you use the dedicated Free Transform tool, things suddenly change—disproportional scaling is the rule, and you press ⌘ to scale proportionally. CorelDraw doesn't do things the way they've been done for years on the Mac, and in the process, the program ensures that many artists will be frustrated.

The saving grace is that CorelDraw excels when it comes to distortions. You can tug and bend outlines in ways simply not possible in Illustrator and FreeHand (see the sidebar "Five Tasks CorelDraw Does Best"). If you're willing to put in the time to learn the Corel Way, there are rewards.

■ **Transformations/Masks/Blends Champ:** *Illustrator 8.0*

Formatting and Manipulating Text

The logos and designer type treatments we see around us in magazines and posters all started out in drawing programs. Programs like Illustrator, FreeHand, and CorelDraw are unique in the software world for permitting you to fit text to a curve, stroke character outlines, and convert letters to editable paths. For many designers, these are the very reasons they own a drawing program at all.

Modest but Solid Illustrator lags behind FreeHand for type-handling abilities mostly because it lacks style sheets, it doesn't let you change the slant of type on a curve, and it offers only rudimentary support for multipage documents.

What Illustrator does, however, it does right. Instead of offering style options such as bold and italic, which have no bearing on the many typeface families that include stylistic variations such as black, condensed, semibold, and a wealth of others, the Character palette presents you with two pop-up menus: one for the font and the other for the true designer-defined styles. You can even create custom variations on Multiple Master fonts, just the thing if you need picture-perfect copyfitting.

Illustrator is also the only Macintosh program I've seen that lets you access the prebuilt fractions (such as ¼) included with most PostScript typefaces. And like FreeHand, Illustrator lets you modify most formatting attributes, such as kerning and leading, directly from keyboard shortcuts—a helpful time-saver.

Unmatched Excellence Be that as it may, FreeHand still dominates this category as it has since FreeHand 1 first beat Illustrator to market with a feature that let you put type on a curve. FreeHand's style sheets rival those in Adobe PageMaker and QuarkXPress and are much easier to use. Just option-click on a style name and you can edit every attribute, from typeface to paragraph spacing, all in a single dialog box. Unlike Illustrator, FreeHand also lets you link a standard text block to type on a curve—great for free-form layouts.

If you ever need to create a list or catalog, FreeHand is also clearly your buddy. It's the only drawing program that accommodates multiple lines of type between tab stops. FreeHand also supports multipage documents—even with varied page sizes and orientations—an essential feature for those who use their drawing program to design brochures or complex packaging.

Glitz without Guts When it comes to type-handling features, CorelDraw delivers the glitz—*all* its special effects, from masking to enveloping, are applicable to editable type. Unfortunately, it chokes on the workaday routine.

Basic timesaving features are missing from this program. For example, you can't kern from the keyboard. Instead you drag little handles to adjust letterspacing—a terribly imprecise *and* tedious approach. When you edit text, tab stops

On the Road: FreeHand Adobe Illustrator is Ron Chan's "everyday tool," so we asked him to take FreeHand 8.0.1 for a spin. He was surprised how difficult it was to make the transition, but as he created this drawing he did find some features he thought were keepers. To make sure his colors look just right, Chan always previews his drawings in Photoshop. Usually, fixing colors that have shifted is a pain, but FreeHand's powerful find and replace tool gave him a new way to do so quickly and thoroughly—he could select a color and change it everywhere (even in the gradients) within seconds.

RON CHAN

1. **Trace scanned images.** Kudos to CorelDraw for bundling the stand-alone CorelTrace, but FreeHand's integrated tracing tool is more reliable and easier to use. It traces multiple paths at a time, fills them with up to 256 colors, and offers expert edge control. No tool measures up to hand tracing, but this one comes the closest.

2. **Create tables.** FreeHand still creams the competition in the text department, and its tabs and tables are the crème de la crème. Besides supplying the widest array of tab-stop options, FreeHand lets you divide a text block into editable rows and columns for spreadsheetlike control.

3. **Repeat a series of transformations.** Clone a path, rotate it, scale it, rotate it again, and transform it in a hundred different ways. Repeat the whole shebang by pressing ⌘-D. Unlike CorelDraw, FreeHand doesn't make you clone and transform according to a prescribed ritual. If you just work naturally, FreeHand keeps up.

4. **Search and replace objects.** FreeHand is the king of the graphic search, select, and replace. Search according to font, color, stroke weight, and even path shape. This has handy applications—look for speedy draft-quality blends that have 10 steps or fewer, and then replace them with the slow-drawing, smooth-printing, 100-step variety.

5. **Create animated Web graphics.** Illustrator is the better all-around Web-graphics app, but only FreeHand lets you create Web animations. Blend a series of objects, expand the blend to layers, and export the layers as frames in Macromedia's Flash format.

conveniently appear in the horizontal ruler, but to simply change the alignment of a tab stop, you have to visit a dialog box, switch panels, hunt down the tab stop in a list, and choose a different alignment option. Strangest of all, there's no command or shortcut for selecting all the words in a text block, a simple matter of ⌘-A in FreeHand and Illustrator.

■ **Text Champ:** *FreeHand 8.0.1*

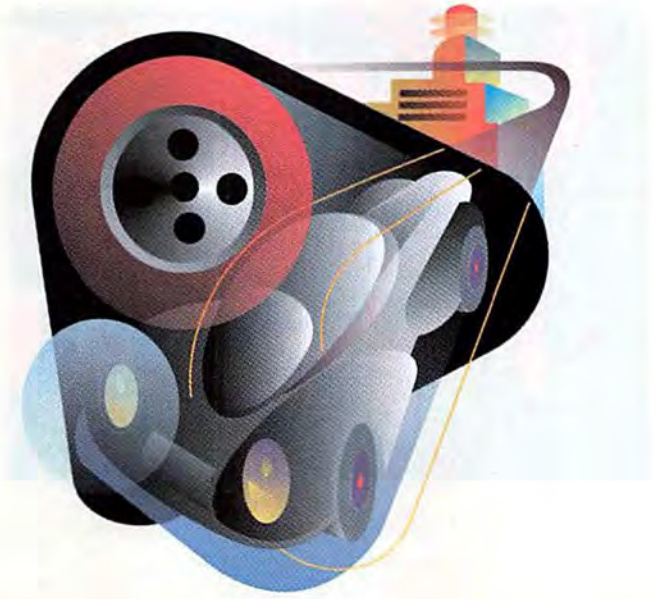
Fill, Stroke, and Color

You'd think assigning color would be an open-and-shut matter in a drawing program—after all, it's just a question of filling the interior of shapes and stroking the outlines. But there are still lots of variations among the Big Three. Name any fill, stroke, or color feature, and you'll find one program that's out of step.

Take arrowheads, for example. CorelDraw conveniently lets you convert any shape into an arrow and fit it to a stroked path. FreeHand provides an editor that lets you build and catalog arrows on the fly—also nice. All Illustrator can muster is a lame plug-in that serves up a handful of Zapf Dingbats characters.

Illustrator isn't the only offender. FreeHand's fill and stroke options are strewn among five different palettes, and its eyedropper tool lacks a keyboard shortcut. CorelDraw refuses to show you

FIVE TASKS CORELDRAW DOES BEST



On the Road: CorelDraw Artist Hank Osuna loves shapes. So much so that before PostScript drawing programs existed he cut templates out of Mylar and then traced the edges with a pen to make his curves *really* smooth. When we asked Osuna to put CorelDraw 8.0.1 through its paces, he found himself somewhat confused by its interface but impressed by ways it made experimenting with shapes easy. He used the Interactive 3-D tool to quickly create the buildings in the background of this illustration by drawing squares and extruding them. He appreciated being able to rotate, extrude, and experiment with light without taking time to create the illusion of 3-D space himself or having to work in another program.

1. **Blend paths.** Only CorelDraw lets you adjust the acceleration of a blend with separate control over the pace of intermediate steps and colors. Also unique: you can convert any step in the blend to an independent anchor path, which means that you can change the shape of a blend in its center.

2. **Distort type and graphics.** CorelDraw's Interactive Envelope tool lets you stretch a complex group of paths in eight directions at once, and it's even applicable to fully editable text. FreeHand's Envelope Xtra isn't in the same league.

3. **Create translucent objects.** CorelDraw 5 for Windows introduced dynamic lens effects years before FreeHand did, and Corel has been improving them ever since. Add and subtract color values, colorize, and magnify with a fish-eye lens. But even that pales in comparison to the Interactive Transparency tool, which fades and blends objects with any background.

4. **Draw plans and diagrams.** CorelDraw lets you specify a scale of measure and automatically labels the height and width of objects, essential for creating schematics and architectural plans.

5. **Explore 3-D effects.** Can Illustrator extrude type and graphics into 3-D space? Can FreeHand bevel the edges of editable letters and apply realistic lighting? No, but CorelDraw can. The redraw is as slow as molasses, but that's the price you pay for true 3-D.

HANK OSUNA

Pantone numbers unless you visit a dialog box that just so happens to let you apply only one color at a time.

Different Strokes Lest you grow sour and disillusioned, we should inform you that each application is innovating in new directions. Illustrator's hot new feature is the Brushes palette. After saving a series of paths as a brush, you can use the brush to create traditional-looking paint strokes or twisting images. Edit any of the paths that make up the brush, and Illustrator automatically updates the brush to fit. This approach is simple, dynamic, and very effective—a boon to artists trying to give their drawings a different look.

Power with Pizzazz To expedite the editing of your art, FreeHand lets you search and replace according to fill, stroke, and other attributes. Not only is FreeHand's Search And Replace palette set up more conveniently than CorelDraw's equivalent wizard, but the FreeHand palette also lets you sample colors from an illustration—the only sure way to get the search criteria right.

FreeHand 8 also adds a new feature—lens effects. The most useful aspect of this is that you can fill a shape with translucent color. You can likewise magnify an area and center the effect anywhere in your artwork, just the ticket

if you want to draw, say, an offset refraction in a pair of glasses.

Flashy Effects CorelDraw is no slacker in the competition for flashy fill and stroke effects. Its lens effects were, after all, the inspiration for FreeHand's. While CorelDraw lacks FreeHand's automatic updates—you're forever having to click on the Edit and Apply buttons to see the result of your changes—its effects are more numerous, including a fish-eye magnifier.

If you're smart, however, you'll ditch CorelDraw's Lens palette and focus on the program's Interactive Transparency tool. This is one of CorelDraw's most compelling features—it lets you use linear and radial gradients to fade an object into nothingness. You can even apply Photoshop-like blend modes such as Multiply, exactly what you need to create a colored cast shadow.

■ **Fill/Stroke/Color Champ:** *Three-way tie*

Web Graphics

Drawing programs were never designed with Internet output in mind, but it's just too trendy a topic for them (or us) to resist. The category is so new that there's very little overlap in features.

Bang-up Basics Illustrator's Web features deliver practical support to artists exporting work for the Web. You can open the Web-safe color palette in an independent window without closing other colors. The program's image-map support is excellent—after you assign URLs from the handy Attributes palette, Illustrator even generates the client-side HTML.

There's also easy access to essential GIF and JPEG export options (although unlike in FreeHand, you're on your own to manually append vital extensions such as *.gif*). The program does the best job of exporting PDF pages. Finally, if you care to finesse your artwork in Photoshop—which you probably will—only Illustrator lets you export complex artwork with every layer intact. If you're primarily interested in creating basic Web graphics as efficiently as possible, Illustrator delivers.

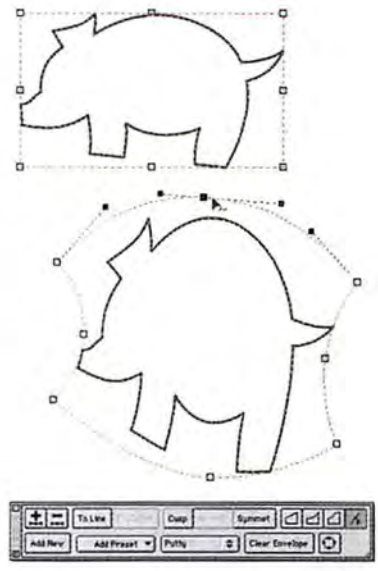
Animation Innovator On the other hand, FreeHand's approach to Web graphics focuses on Web *animation*, primarily in the form of Shockwave Flash output (Macromedia's proprietary vector-graphics standard for the Web).

FreeHand makes animation easy. After blending among a few paths, for example, you can automatically assign each step in the blend to a layer and then export the layers as frames in a Flash animation. You can also export the *pages* in a FreeHand document as frames. If you have the $499 Design in Motion Suite, you can also use Insta.HTML to export artwork as Dynamic HTML (DHTML).

FreeHand's more basic Web-graphics features, however, don't shine as much as Illustrator's. FreeHand makes you import Web-safe colors into the Colors palette, where they can become confused with unsafe colors. The program cannot save Photoshop files with layers intact.

If you want to create Web animations, FreeHand can't be beat. Otherwise Illustrator's more modest but well-implemented Web features are your best bet.

Limited Control CorelDraw comes at Web graphics from a completely different angle—in addition to creating dynamic drop shadows and 3-D extrusions (handy for making all those navigation buttons), CorelDraw lets you assign



Dynamic Distortions No drawing program compares to CorelDraw 8.0.1 when it comes to distortions. After selecting the Interactive Envelope tool, you can drag at eight points around the boundary of a shape. You can even add points and adjust control handles to get exactly the effect you want.

Illustrious Implementations

	EDITORS' CHOICE Illustrator 8.0	FreeHand 8.0.1	CorelDraw 8.0.1
Company	Adobe Systems	Macromedia	Corel
Mouse rating	●●●●½	●●●●	●●●½
Price	$375 company's estimate	$399 company's estimate (Design in Motion Suite, $499)	$695 list
Phone number	408/536-6000	415/252-2000	613/728-8200
Bundled software	Adobe Acrobat Reader	Design in Motion Suite includes Flash 3, Insta.HTML 2	Canto Cumulus Desktop 4, CorelPhoto-Paint 8, CorelTrace 8, Font Reserve 1.02
Interface and compatibility champ	•		
Drawing and editing champ	•	•	•
Transformations, masks, and blends champ	•		
Formatting and manipulating text champ		•	
Fill, stroke, and color champ	•	•	•
Web graphics champ	•		

On the Drawing Board: Canvas 6

FOR THOSE SHOPPING FOR A DRAWING PROGRAM, FreeHand, Illustrator, and CorelDraw aren't the only options. By the time you read this, Deneba (305/596-5644, www.deneba.com) will have shipped the $375 Canvas 6, which is certain to offer high-quality drawing tools and features.

Comparing the packages in this shoot-out directly to Canvas is like comparing apples to, well, the whole basket of fruit. Canvas isn't just a drawing program; it is an image-editing, page-layout, Web design, and presentation program, too.

Innovative Effects Canvas 6 wasn't shipping at press time, but we took a peek at a late-beta version. (Look for our upcoming review.) We found that the program's best features spring directly from Canvas's signature strength—the marriage of bitmap and vector technology.

Deneba's SpriteLayers technology lets you create some interesting transparency effects that would be difficult—if not impossible—to make in a dedicated drawing program. The effects can be applied to anything—bitmapped images, vector-based drawings, *and* text. For example, you can create a vignette in which your artwork becomes gradually more transparent near the edges. Apply a vector-transparency gradient mask (or a custom mask) to experiment with the size and positioning of the vignetted area. You can also place the transparent area in the *interior* of a graphic to create cutaway views. For example, you can layer a scanned photograph of the Statue of Liberty over an illustration of its supporting structure and then make the uplifted arm of the statue transparent to reveal the beams underneath. The elements always remain editable even after you've applied the effect.

A Tidy New Look We were also impressed by Canvas's new face-lift, which helps your workspace stay better organized and perform more efficiently. Stash floating palettes in Canvas's new docking bar—a thin horizontal strip, just above the drawing area, that displays only the tabs of each palette. Click on a tab to make a palette unfurl. You can rearrange the tabs along the bar at will. Also new is a customizable tool bar.

A New Image Canvas 6's spiffy new look includes a streamlined interface with a customizable tool bar and a docking bar.

Canvas 6 also addresses a gripe users had with earlier versions, namely that the drawing tools weren't robust enough. New tools include a knife for slicing vector objects, as well as others for drawing arcs and ellipses by defining three key points. Other complaints centered on Canvas's limited set of supported file formats—this also appears to be remedied.

A Promising Future We'll have to wait for the shipping product to see just how Canvas 6 rates. But it's already clear that in the competition of the graphics titans, Canvas 6 is fighting with a unique set of weapons.—SHELLEY CRYAN

URLs to objects and then output them as full-blown Web pages.

Many of these features are tricky to use. Although you can export full-blown Web pages, you have little control over the output of individual images. There's limited GIF color-palette control. File-size estimates are often inaccurate. CorelDraw offers no PDF support and cannot save images as layered Photoshop *or* CorelPhoto-Paint files.

■ **Web Graphics Champ:** *Illustrator 8.0*

Macworld's Buying Advice

The politics of drawing tend to be pretty darn partisan—Illustrator users regard FreeHand as clumsy and disorganized, FreeHand users see Illustrator as awkward and incapable, and so on.

If that's the way you feel, then buy the drawing program that appeals to your politics and how you work. For once, you can't go wrong—Illustrator 8.0 and FreeHand 8.0.1 are both excellent, so who cares how the competition shapes up? And while Corel doesn't have much of a following on the Mac, CorelDraw 8.0.1 may earn one.

For those who are apolitical or new to the drawing scene, however, we recommend Illustrator. It wins or ties in five of our categories and performs well in the sixth. FreeHand is a better choice for artists who create multipage, text-rich work or Web animations. But for the *general* artist, Illustrator is a solid overall program with more new features than loyal Illustrator users have seen in years.

The fact is, the competition has never been closer. I'm happy to say that we've most certainly entered drawing's golden age. **m**

Contributing Editor DEKE McCLELLAND has written guides for all three illustration programs—*Real World Illustrator 8* (Peachpit Press, 1998) and *FreeHand 8 Bible* and *CorelDraw 8 for Dummies* (both IDG Books Worldwide, 1998).

EDITORS' CHOICE

★★★★½ **Adobe Illustrator 8.0** This program's streamlined interface and excellent feature set make it the strongest overall drawing choice. **Company:** Adobe Systems (408/536-6000, www.adobe.com) **Company's estimated price:** $375.

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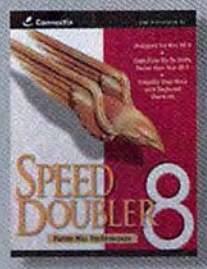

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Be Safe,

OUR EXPERT TIPS WILL MAKE SURE YOUR DATA OUTLIVES YOUR DRIVE

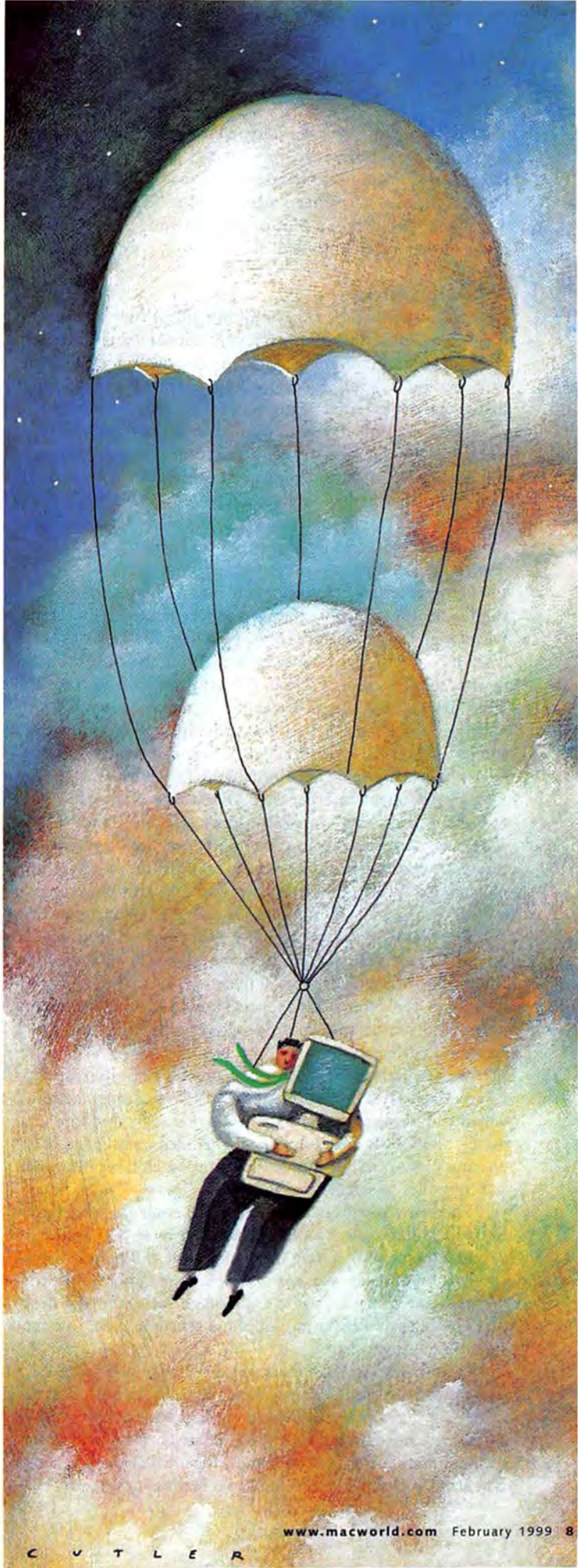
Not Sorry

BY ADAM C. ENGST

It'll never happen.

Just about every Mac user will say those famous last words at one time or another—often right before some event causes irretrievable data loss. Maybe you'll accidentally delete a folder containing an important file, or perhaps your hard disk will bite the dust. Data can disappear in a myriad of ways: fire, earthquake, a broken water pipe in the apartment upstairs, or even theft.

Be assured, you *will* lose data at some time or other. A few months back, my wife and I returned from a weekend with friends to find a broken window and an empty spot where our PowerBook 5300 once sat. All the files on that PowerBook were suddenly and irretrievably gone. Or rather, they *would* have been but for the fact that we back up regularly. That backup saved hours of work on one document, along with records we keep for tax purposes that would have been impossible to re-create.



ILLUSTRATIONS BY DAVE CUTLER

So consider me the little voice in your head that tries to prevent you from doing really stupid things like attaching weather balloons to your deck chair to see if you can fly. Backups are important, and you *will* need them one day. If you don't believe me, ask a friend to take a copy of a random folder on your hard disk and then delete the original.

Software Saviors

Although it's possible to back up individual files by copying them onto a disk by hand, I strongly encourage you to use a *real* backup program. Sure, you could use the Finder, file-synchronization utilities, or custom AppleScripts for backup. But these approaches require extra effort that's simply not worth it, given how easy it is to use automated backup software.

When you're choosing backup software, stick to commercial applications from reputable companies. You'll never want tech support more than when you drop your PowerBook down a staircase and you need to retrieve a vital piece of work. Shareware is great, but you should entrust your backups only to a program from a company you can hold accountable.

Retrospect Rules When it comes to Mac backup software, the leader these days is the Retrospect family, from Dantz Development (www.dantz.com). Although the lack of choice when it comes to Mac backup software is unfortunate, the good news is that Retrospect is both powerful and flexible. (See the table "Backup Bonanza: 5 Backup Programs Compared.")

The $175 Retrospect 4.1 does it all. It backs up to any storage device you can mount on your desktop, essentially all varieties of tape drives, CD-Recordable (CD-R) drives, and even FTP servers on the Internet. You can select precisely which files to back up; create sophisticated backup schedules; and back up files over networks, from traveling PowerBooks when they return to your network, from networked Windows PCs, and much more. Although Retrospect is easy to use, its power makes it ideal for people with multiple Macs (and PCs) on a network.

The $50 Retrospect Express 4.0, in contrast, is meant for use on a single Mac. It lacks Retrospect's flexible file selection and support for tape drives and network backup but makes up for it with a much lower price and simplified interface. Home users with removable-cartridge drives will find Retrospect Express a perfect fit.

The Alternatives The only real alternative to Retrospect is CharisMac's $130 Backup Mastery 1.05 (www.charismac.com), which can write to any storage device on your desktop, tape drives, and CD-R drives. It offers scheduled unattended backups and backup scripts but doesn't offer much flexibility when selecting files or scheduling backups.

There are two alternatives for those people for whom even Retrospect Express is overkill. Redux Software's $40 Redux 2.6 (www.reduxsw.com), a long-awaited revival of a popular backup program of yesteryear, lets you back up in either Finder format or Redux's own format to any storage device on your desktop. You can save scripts in Redux and schedule them to run at repeating intervals.

Even simpler is ASD Software's $49 Personal Backup 1.2.3 (www.asdsoft.com), a control panel that works with desktop storage devices. Personal Backup offers basic backup features along with timed backup, hot-key–initiated backup, and a user-specified number of backup copies. Personal Backup can also synchronize files between folders and record your keystrokes.

What to Back Up

No matter which program you choose, your next step is to choose exactly what files you want to back up. Will you back up all your files or just the important ones? What about your System Folder? Is it worth it to back up your applications?

Saving It All The simplest choice when backing up is to save *everything*. If you back up every file you've got, you won't need to spend much time configuring your backup software—just aim it at your hard drive and you're set. If you need to restore your entire hard disk, you can be up and running quickly since you won't have to piece together a new System Folder, reinstall all your software, and adjust all your preferences.

KEVIN CANGLAND

Hardware Helpers For the safest backups, consider buying a CD-Rewritable drive (left) or a digital-audiotape drive (right).

However, backing up every file you've got means you need a whole lot of backup storage space—a real pain if you're trying to back up 1GB or more of data to a collection of 100MB Iomega Zip disks.

Even if you decide to back up everything, don't take *everything* too literally. There's no reason to waste space in your backup on a Web browser's cache files, invisible files, the contents of the Trash, or your deleted e-mail.

In Retrospect, you can create a series of *selectors*, or rules, that can exclude all these files. (Other programs are less sophisticated when it comes to specifying what files to back up.) The logic of Retrospect's selectors can be tricky, though. By default, Retrospect creates OR constructs; to create an AND construct between two criteria, you must drag one next to the other (see the screen shot "Pick and Choose").

Getting Picky Backing up only certain files is a great way to save space, but be careful—it's easy to miss vital files. For instance, you might not realize that by default, Qualcomm's Eudora stores all your mail in a folder hidden in the System Folder. If you use a macro program like WestCode Software's OneClick or Binary Software's KeyQuencer, your macros also live in the System Folder.

If you do decide to restrict your backup to specific files, here's the order in which you should protect them.

Documents Your documents may not seem important, but imagine how long it would take you to re-create them. Remember that e-mail messages you've sent and received can be just as important as spreadsheets and databases.

Preferences Folder Backing up your preferences will free

you from having to dig out all your software registration cards if you've got to reinstall an application. Be sure, however, to exclude your Web browser's cache folders.

System Folder Your System Folder is the result of hours of installation and configuration. Sure, you could do it again, but why bother? The folder might also be harboring vital data you don't know about, like your Eudora mail folder.

Backup Strategies

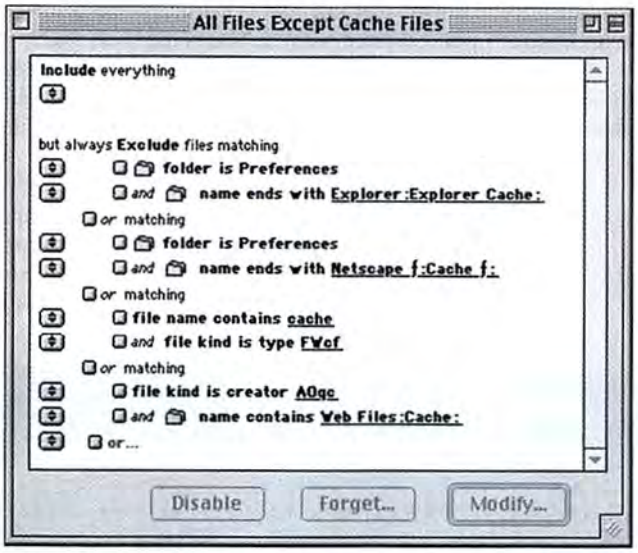
No matter what you choose to back up, you must come up with a strategy for performing regular backups. Think about creating multiple backup sets, scheduling automated backups, and verifying the integrity of your backups.

Back Up Your Backup Too many people simply copy their hard drives to an Iomega Jaz cartridge or burn it on a CD-ROM and assume they're taken care of. It's better than nothing, but it still leaves you far too vulnerable. A thief could easily take the backup along with your Mac, or a fire could destroy both. Or you could be hammered by Murphy's Law and have the backup cartridge go bad just when you need it.

Instead, create multiple backup sets—collections of backup disks or tapes—and alternate among them. For instance, I have three Retrospect backup sets, which Retrospect calls *StorageSets*. Each set of digital audiotapes backs up for a week and then is replaced by the next set.

Creating multiple separate backups provides three advantages. You spread out the risk of having your backup fail when you need it (if one dies, the last backup on another is no more than a week old). Second, you can store one of the backups elsewhere to protect against theft and catastrophe (I change tapes every Monday morning, storing the one I've just removed off-site). Finally, you gain increased protection: what if you accidentally delete a file and then make a backup? At that point, you've destroyed your chance to retrieve that file—but not if it still exists on one of your alternate backups.

Timing Your Backups Particularly when working with multiple backup sets, you shouldn't have to worry about keeping track of when to back up to each set. All the backup programs provide scheduling capabilities of some sort. Use them to create a regular backup schedule. For instance, I back up all my desktop Macs' hard disks every day starting at 1 a.m.



Pick and Choose To create a selector in Retrospect, choose an item from a pop-up menu on the left and then either leave the item where it was created, for an OR rule, or drag it elsewhere to create an AND rule.

Test Your Backups Even worse than the sob stories from people who didn't back up are those from people who did but found that their backups were worthless after a crash. A false sense of security is more dangerous than having no backups at all. Every so often, restore some files from each of your backup sets. Disks do go bad, and once they have, you shouldn't use them for anything important. Just throw out bad tapes—there's no safe way to reuse a suspect tape.

The Right Hardware

Choosing the right backup software and learning how to use it effectively does you little good if you haven't picked an appropriate storage device to house your backups. There are numerous choices when it comes to picking a backup device, ranging from the (almost) ubiquitous floppy-disk drive up to dedicated tape drives. You can even back up to someone else's hard drive via the Internet (see the sidebar "Backup by Modem"). Which is best for you depends on your specific situation. Remember

Backup Bonanza: 5 Backup Programs Compared

Company	Product	Mouse Rating	List Price	Phone	CD-R, CD-RW Support	Tape Support	Comments
ASD Software	Personal Backup 1.2.3	♦♦♦	$49[A]	909/624-2594	○	○	Implemented as a control panel, includes synchronization and keystroke recording.
CharisMac Engineering	Backup Mastery 1.05	♦♦½	$130	530/885-4420	●	●	Weird interface, and has minimal file-selection flexibility.
Dantz Development	Retrospect 4.1	♦♦♦♦♦	$175	925/253-3000	●	●	Feature-laden and extremely flexible; is overkill for individual use.
	Retrospect Express 4.0	♦♦♦♦♦	$50	925/253-3000	●	○	Stripped-down version of Retrospect easier to use but less flexible.
Redux Software	Redux 2.6	NA[B]	$40	703/787-9448	○	○	Old favorite resurrected, but interface shows its age.

● = yes; ○ = no; NA = not applicable. [A] Company's estimated price. [B] Product was not shipping at press time.

that the price of the drive is only part of the overall cost—make sure to factor in the cost and convenience of media as well.

Floppy Disks For most backup situations, 1.4MB floppy disks don't hold enough data, and they're not particularly reliable. Floppies are fine for making yet another backup of that file you'd just die if you lost, but that's it.

Second Hard Drive A second hard drive is the fastest backup device you'll find, which makes it good for frequent backups to protect against damage to your main hard disk. If you run RAID software, such as CharisMac's RAID 2.0, you can mirror your main hard disk to another constantly. If something bad happens to one drive, the other can be put to work almost immediately. However, additional hard disks won't save you if a burglar or disaster strikes, so it's best to stick with removable-media drives (see "Gigs to Go," November 1998).

Low-Capacity Removables Iomega's (801/778-1000, www.iomega.com) Zip drive is too low-capacity for complete backups of today's multigigabyte hard disks, but it works well for home users with relatively little important data to back up. Plus, Zip disks are inexpensive, so you can afford to make multiple backup sets—extra important because Zip disks aren't incredibly reliable. Another entry in this category is the 120MB

Backup by Modem

DON'T WANT TO BUY SPECIAL BACKUP HARDWARE? There is another option: backing up over the Internet. Using the Internet for backup is great because your backed-up data is physically separate from your Mac in case of theft or disaster. But given the slow throughput of the average modem-based Internet connection, Internet backup services are primarily useful for backing up a small set of important files, not your entire hard disk.

When you're evaluating any Internet backup service, make sure your files will be compressed and encrypted. Compression can reduce overall transmission time significantly. Using encryption is the only way you can be sure that your data remains private as it travels across the Internet and is stored on remote servers. Finally, make sure that your Internet backup service also does backups—your backup strategy is only as good as theirs.

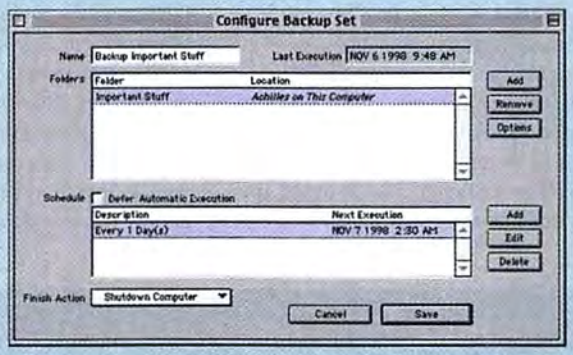
There are two ways of backing up over the Internet: using either Retrospect or the integrated BackJack Internet backup service, from Synectics Business Solutions (519/986-4574, www.backjack.com).

Retrospect Version 4.1 of Retrospect and Retrospect Express (which should be available by the time you read this) let you store your backed-up data on an Internet FTP server. If you use Retrospect to back up a network of Macs, an Internet backup would be an excellent secondary, off-site backup of your most important files. If you had relatively few important files, you could rely entirely on Retrospect Express and Internet backups to avoid purchasing an expensive backup device.

Retrospect treats an Internet FTP server as another type of media, just like a disk or tape. You create a StorageSet in Retrospect or Retrospect Express; choose Internet for the storage type; and then enter your user ID, password, and FTP server. You can also enter a directory on the FTP server; if you don't know what to type, click on the Directories button.

Since other people may have access to your FTP backups, be sure to turn on Retrospect's encryption when you create Internet backup sets. Also turn on Retrospect's software data compression in the Options tab when you're setting up a backup.

Most Internet accounts come with several megabytes of space on a remote FTP server (ask your service provider for details), and you may be able to purchase more space if you need it.



Hit the Road, Jack To configure a BackJack backup set, select a folder to back up, create an execution schedule, and choose a finish action.

If you need to back up more data than your ISP's server is willing to accept, consider a service that offers FTP space specifically for backup. Dantz is certifying Internet backup services based on the companies' commitment to security, reliability, and customer service. Right now there are two of these services: Digital Forest's Recover-It (www.forest.net/backup/recover-it.html) and Committed To Memory's MacBackup.com (www.macbackup.com). Both companies charge based on the amount of data you store with them each month.

BackJack BackJack is an all-in-one service that uses the proprietary BackJack software and space on the BackJack server. All you have to provide is the Internet connection.

BackJack provides a simple application for backing up and restoring files over the Internet (see the screen shot "Hit the Road, Jack"). It's nowhere near as flexible as even Retrospect Express but compares to Redux and Personal Backup. You can select specific folders, save several versions of backed-up files, and schedule backups; you can't exclude certain files from a folder, search for files to restore, or automatically restore just the latest versions of files.

One advantage BackJack has over Retrospect is that because BackJack can automatically save only a few versions of files, deleting older versions, you won't need to prune your backup set manually. Plus, BackJack always compresses files using Aladdin Systems' StuffIt Engine and encrypts them before sending them to the BackJack server.

The Skinny Both Retrospect and BackJack properly backed up and restored files over the Internet. There's no question that Retrospect and Retrospect Express are much better backup programs, but they aren't free, like the BackJack software. Usage fees are comparable: both BackJack and the FTP services charge based on how much data you store on their servers. Backing up 75MB initially and then 1MB per day would cost less than $25 per month, and restoring is always free.

SuperDisk, from Imation, although it's quite slow. Avoid the Zip or SuperDisk for serious backup situations.

High-Capacity Removables Iomega's Jaz 2GB drive uses the same rigid disk media found in hard drives—encased in a removable cartridge. While the drive's price is reasonable, its cartridges are pricey at $100 each. The main downside to this drive is mediocre reliability. It will work fine for individual Macs with large hard drives, but it's too expensive and unreliable for serious backup situations, particularly with multiple Macs.

Magneto-Optical Drives Modern magneto-optical (MO) drives hold either 640MB or 2.6GB, which puts them in competition with both low- and high-capacity removable drives. MO drives are incredibly reliable, and although they're more expensive than comparably sized Jaz drives, the media costs are lower. If you don't need to share disks with a service bureau, a large MO drive makes a good backup solution for one or two Macs.

CD-R, CD-RW Drives Now that blank recordable CDs cost about $2 each for 650MB of storage, burning CDs for backup is a reasonable proposition (see "Burn, Baby, Burn," September 1998). Unlike with the drives mentioned above (but as with tape drives), writing CD-Recordable (CD-R) and CD-Rewritable (CD-RW) discs requires special software, such as Retrospect or Retrospect Express.

CD-R and CD-RW drives are great for users with only a few Macs. The capacity of a single disc isn't great, but the price per megabyte and overall reliability are good. And CD-R drives can also have other uses, like making audio CDs.

QIC Tape Drives Depending on the tape and drive, Quarter-Inch Cartridge (QIC) capacities range from 4GB up to 20GB. QIC tape drives cost less than comparable digital-audio-tape (DAT) drives, generally, but cartridges are three to five times more expensive and the drives are also slower than DAT drives. QIC drives are ideal for networks of fewer than 20 Macs.

DAT Drives Over the last few years, DAT drives have become the standard for backup situations that require medium to large capacities, inexpensive media, and fast backup speed. DAT drives use Digital Data Standard (DDS) tapes that provide capacities from 2GB to 24GB and cost as little as $6 per tape. Small and medium-size businesses shouldn't settle for anything less than a DAT-based backup system.

8mm-Tape and DLT Drives For the most part, if you need an 8mm tape or digital-linear-tape (DLT) drive, you already know it. DLT and 8mm-tape drives lead the field in capacity, speed, and price. Tapes can hold between 7GB and 80GB of data, speeds range up to 6MB per second, and prices hover between $2,000 and $6,000. Frankly, these drives are overkill for all but the most serious backup situations in large organizations.

Caveat Emptor Whatever your needs, be sure to buy commonly available devices from reputable manufacturers. If you buy a cheapo tape drive that uses a weird format, what do you do if your drive dies and the vendor has gone under?

If you have serious backup needs, such as multiple Macs on a network or truly important business files, be sure to buy a dedicated device for backup, like a tape drive. Removable-cartridge drives that do double duty are acceptable only if regular backups of all your data are less important.

Macworld's Buying Advice

When it comes to software, you won't go wrong with either Retrospect or Retrospect Express, from Dantz Development. Both are packed with features, and deciding between the two is easy. If you need to back up to a tape drive, perform regular network backups, or back up a Windows machine as well as Macs, go for Retrospect. Otherwise, if you're primarily backing up a single Macintosh to a removable-cartridge drive, Retrospect Express has all the power you'll likely need.

In terms of hardware, the choice depends on how many Macs you plan to back up. Individual users with one or two Macs should go for a CD-RW or magneto-optical drive. If you already have a Jaz or Zip drive for sharing files, it'll work for backups as well, but beware of media costs and unreliability. If you're backing up an entire network, stick with a DAT drive unless you need the high performance and capacity of an 8mm-tape or DLT drive. Also think about periodically archiving files to a CD-R.

But however you choose to do it, be sure to back up. Take a moment to consider the relative importance of your files, and then use the advice in this article to craft your ideal backup strategy. Otherwise, be prepared to kiss your files good-bye. m

Which Backup Is Right for You?

Type	Software	Hardware
Home Mac, iMac	Retrospect Express	Zip drive or Internet backup service
Home-office Mac, multiple home Macs	Retrospect Express or Retrospect	Magneto-optical or CD-RW drive
Small office	Retrospect	QIC tape or DAT drive
Large office	Retrospect	DAT, 8mm tape, or DLT drive

ADAM C. ENGST is the publisher of the online newsletter Tidbits (www.tidbits.com) and backs up religiously ever since that time a drunk driver took out a power pole and caused a surge that toasted his 105MB hard drive.

EDITORS' CHOICE

Workgroup Backup

Retrospect 4.1 Combines ease of use for basic operations with a deep feature set that includes network backup (even for Windows 95, 98, and NT), Internet backup, support for a wide range of backup devices, flexible file selection and scheduling, and numerous nice touches such as network clock synchronization. **Company:** Dantz Development (925/253-3000, www.dantz.com). **List price:** $175; ten-client Retrospect Network Backup Kit, $340.

Personal Backup

Retrospect Express 4.0 Trades Retrospect's network backup features, tape-drive support, and flexible file selection for a low price and somewhat simplified interface. **Company:** Dantz Development (925/253-3000, www.dantz.com). **List price:** $50.

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Secrets

Mac OS 8.5: Beyond the Basics

YOU'VE UPGRADED TO OS 8.5—NOW MAKE IT PAY OFF

by Joseph Schorr

Upgrading your system software to Mac OS 8.5 doesn't cost a lot—$99—but it can be a big investment in terms of time and effort. If you've taken the plunge and upgraded, you want to get the most out of your investment—and that means retraining yourself to take advantage of the new tools, shortcuts, keystrokes, and menu commands that are suddenly at your beck and call. Assuming that you've already mastered the basics of OS 8.5, such as tweaking its look-and-feel with the Appearance control panel, it's time to move on to some techniques and shortcuts that take you deep into the heart and soul of Mac OS 8.5.

Playing Favorites

The new Favorites command offers an easy way to access the files, folders, disks, and servers you use most—you can reach it from the Apple Menu or from a pop-up menu in the revised Open and Save dialog boxes. The Finder's File menu now sports an Add to Favorites command, but don't overlook the easiest way to turn any item into a favorite: just control-click on it to bring up a contextual pop-up menu that contains the same command. This trick also works if you control-click on the tiny folder and disk icons that now appear in the title bars of open windows.

Universal Folder Expanding

Mac users have complained for years about the Open and Save dialog boxes' shortage of navigation shortcuts. In OS 8.5, improved Open and Save dialog boxes let you view files in sortable lists containing nested folders, similar to standard Finder list views. (You'll find these revamped dialog boxes only in programs that have been updated to support them.)

Not surprisingly, many of the folder-manipulating tricks that work in Finder windows also work in these dialog boxes. For example, you can select a folder in an Open dialog box and press ⌘–right arrow to display the contents of the folder hierarchically within the dialog box; pressing ⌘–left arrow collapses nested folders in the dialog box. These shortcuts let you navigate to a deeply buried file without drilling down through layers of folders.

The same folder-expanding tricks work in the Network Browser, a new interface that provides easier access to file servers. From the Apple Menu, open the

continues

RICHARD DOWNS

Network Browser to reveal a list of available AppleTalk zones, select a zone, and press ⌘–right arrow; the view expands to show all the servers in that zone. Press ⌘–left arrow to collapse the view.

Drag-and-Serve Networking

The Network Browser is less hassle to use than the old Chooser, but network access is even easier if you take a shortcut: drag the icons of the servers you use most from the Network Browser window onto the desktop to create instant aliases. You can then log on to those servers by simply double-clicking on the icons; there's no need to open the Network Browser or the Chooser. The same trick works with the AppleTalk-zone icons that appear in the Network Browser window: drag a zone icon to the desktop and click on it to simultaneously open a Network Browser window and display the list of available file servers in the zone.

Put Sherlock on a Schedule

Easily one of the coolest features in Mac OS 8.5 is Sherlock. This slick, high-speed search engine sifts through your local files or the Internet, looking for information at lightning speed. Sherlock can even search the content of the files on your hard drive for a specific word or phrase. For this feature to work, Sherlock first has to index your hard drive—a process that can take hours. Apple suggests that you initially have the Find application index your drives when you're not using your computer.

But as Sherlock's index of your hard drive falls out of date, so do the results of your content searches; you have to index your hard drive regularly to keep Sherlock's internal database current. The good news is that you can schedule this to happen automatically. In the Find by Content window, click on the Index Volumes button, then click on the Schedule button and pick the days and times when you want Sherlock to rescan your disks. Back in the Index Volumes window, activate the check box next to each of the drives you want indexed. For example, you can schedule your Mac to turn itself on every day at 3 a.m. and have Sherlock index your drives at 3:05 a.m. When you get to work, your Mac will be completely up to date and ready to perform blisteringly fast content searches.

Expand It, Collapse It You can expand and collapse hierarchical folders in Mac OS 8.5's new Save and Open dialog boxes from the keyboard, just as you can with standard list views in the Finder.

Find Refined

Perhaps even more significant than the Find by Content feature is the fact that the new Find command lets you save the criteria of a particular search. You just press ⌘-S to save a search, or choose Save Search Criteria from the File menu after setting up your search criteria in the Find File window. This action saves the search criteria in a file that you can place anywhere on your hard drive; the next time you want to access the files that the search identified, just double-click on the saved-criteria file to launch the Find application, run the search, and display the results in the Items Found window.

You can also use this technique to rig up an efficient daily backup system. Set up a search that looks for all the documents on your hard drive that were modified today, then save the search criteria. At the end of each day, you can double-click on the search file to get a window displaying all the files on your Mac that need to be backed up. Drag them from the Items Found window to a backup disk, and you're done.

Actually, these tips just scratch the surface of what you can do with Sherlock. See next month's column for a full-blown collection of Sherlock secrets. ■

JOSEPH SCHORR is the coauthor of *Macworld Mac Secrets*, fifth edition (IDG Books Worldwide, 1998).

The Sound of Menus

APPLE HAS ROLLED DOZENS OF SUBTLE changes into the design of the new OS, but at least one new feature is anything but subtle: Mac OS 8.5 makes noise. Turn on the Platinum Sounds soundtrack in the Appearance control panel, and suddenly your Mac is snapping and ticking its way through every drag of an icon or selection of a menu command. The only disappointment is that you just get one set of sounds, but with a little help from ResEdit you can create a new soundtrack with your own custom sounds.

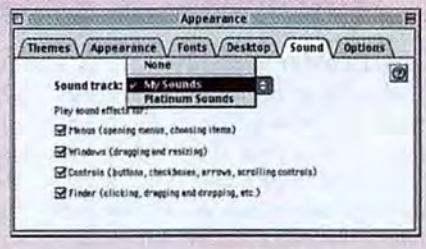
1. Make a copy of the Platinum Sounds file (in the Sound Sets folder, inside the System Folder's Appearance folder), and open the copy with ResEdit.

2. Open the Snd Resource icon to reveal the 67 sounds that make up the Platinum soundtrack. To hear a sound, select it and choose Try Sound from the Snd menu.

3. To replace one of these sounds with your own, first record your sound from any audio source, such as a CD, using the Record New Sound command in the Snd menu; it will appear as a new sound resource at the top of the Snd list.

4. Suppose you want to use this sound to replace the one that plays when you're dragging items across the desktop. Make a note of its ID number and name, then delete the old resource by selecting it and choosing Cut or Clear from the Edit menu.

5. Select your new sound and press ⌘-I to see the Info window for the resource. Type in the ID number and the name of the resource you want to replace, then close the window. Save your changes in ResEdit, close the file, and install it in the Sound Sets folder. Now you'll be able to choose your edited sound set from the Sound Track pop-up menu in the Appearance control panel.



Replacing a whole sound set takes diligence—some of the sounds that accompany system actions are actually made up of several different sounds played in rapid succession—but with some effort you can give your Mac a voice that's uniquely its own.

Quick Tips

Tips, Tricks, and Shortcuts

by Lon Poole

One of Mac OS 8.5's great new features is its multitalented Sherlock searching program (see also *Secrets*, in this issue). In addition to searching for files in the same way as Find File in previous Mac OS versions, Sherlock quickly searches the Internet by sending your queries to multiple Internet search sites and presenting their combined results, ranked by relevance, in a single Sherlock window. (Click any of the found items to see the corresponding page in your Web browser.)

You can add to Sherlock's six standard Internet search sites (AltaVista, Apple Tech Info Library, Encyclopedia.com, Excite, InfoSeek, and Lycos) by dropping special plug-in software modules onto your Mac's System Folder icon; the Finder automatically routes them to the Internet Search Sites folder inside the System Folder. You'll find diverse search-site plug-ins from the growing collections at the Sherlock Plug-in Directory (www.apple.com/sherlock/plugins.html), Raul's Sherlock Plugs (www.teamdraw.com/raul/stuff/stuff2.html), and Sherlock Internet Search Archives (www.apple-donuts.com).

But too many plug-ins make Sherlock cumbersome, observes Joshua Rafofsky of Los Angeles. Collect a couple dozen search-site plug-ins, and you'll wish you could enlarge Sherlock's window to see more than six sites without scrolling. Until Apple amends this, you can easily modify Sherlock to make its main window resizable using Rafofsky's free utility Moriarty, available on his Web site at http://members.aol.com/appleink98/moriarty.htm. The modified Sherlock doesn't have a visible size box in the lower right corner of its window, but you can change its size by dragging the window from that corner.

Even with a larger Sherlock window, the list of search sites becomes unwieldy when it grows to 50 or 100—and Sherlock won't let you show or hide sites by group or category. Rafofsky suggests grouping these sites with Casady & Greene's venerable Conflict Catcher.

To set this up, open Conflict Catcher and choose Preferences from the Edit menu. Select the Folders icon in the scrolling list on the left side of the Preferences dialog box, and click the Add button to display the Create Folders dialog box. Here you set the Starting Folder option to the System Folder and enter **sce**—a standard suffix for Internet search-site file names—in the space provided for an abbreviation. Then, still in the Create Folders dialog box, click the Folder button. In the Open dialog box that appears, select the Internet Search Sites folder. Now you can use Conflict Catcher to manage your Internet search sites just as it manages your extensions and control panels.

JEFFREY PELO

For each group of Internet search sites you want to establish, make a duplicate of your everyday set (probably named Standard Set) in Conflict Catcher. In each duplicate set, indicate which sites you want active and name the set appropriately (for example, Software Sites, or Business and Stock News). If you turn on the Finder Menu option in the General section of Conflict Catcher's Preferences dialog box, you can quickly switch among these sets by choosing from this menu. The change occurs the next time you run Sherlock—there's no need to restart your Mac.

Switching among Windows

Q. How do I switch among open windows via the keyboard, as PC users do using Windows 95's Alt-Tab command?

TOM ADAMS
via Macworld Online

A. Upgrade to Mac OS 8.5, and tear off the Application menu (at the right end of the menu bar) to turn it into the Application Switcher window. To do this, click the Application menu icon, drag your cursor down the menu and past the bottom, and position the resulting window wherever you like. Then you can press ⌘-tab to switch to the next application, or press ⌘-shift-tab to switch to the previous application.

If you don't want to upgrade to Mac OS 8.5, you can add similar keyboard shortcuts by installing Michael F. Kamprath's $10 Program Switcher control panel, or one of several other similar utilities. You can set advanced options in

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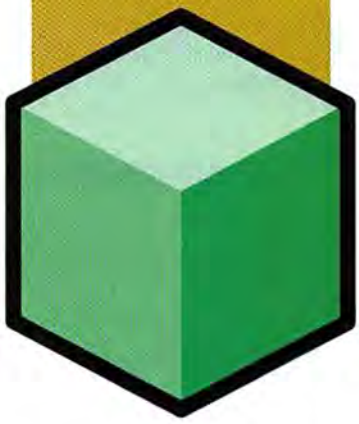

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Program Switcher to make program switching look and work very much as it does in Windows 95.

The Microsoft Office Manager control panel can also facilitate keyboard-based switching between programs, but has been known to cause problems. (For details, search for Microsoft Office Manager on Ted Landau's MacFixIt Web site at www.macfixit.com/searchengine.shtml.) This control panel, installed automatically with Office 4.2.1, is not part of a standard Office 98 installation; you must drag the control panel from the Value Pack folder on the Office 98 CD to your System Folder.

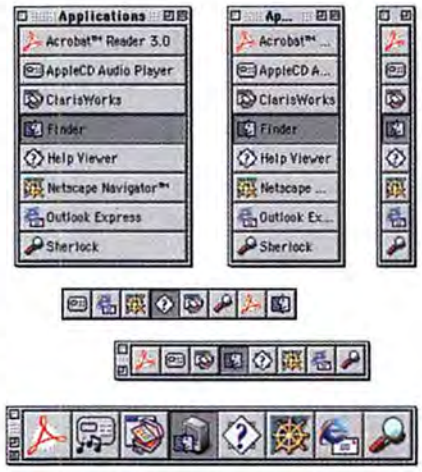
Unearthing Application Switcher Secrets

Q Now that Mac OS 8.5's Application Switcher uses ⌘-tab, this keyboard shortcut no longer has its incredibly productive function in QuarkXPress or FileMaker Pro. Is there any way to change the Application Switcher's keyboard shortcut?

JEEP WATSON
Baltimore, Maryland

A One way is to use the on-screen help that comes with Mac OS 8.5. First make sure the Finder is active, and then choose Mac OS Help from the File menu. On the left side of the Mac OS Help window, click Files And Programs. Then, on the right side of the window, click Switching Between Open Programs. Scroll down until you see the underlined text "Help me modify the keyboard shortcuts," and click this text. A series of dialog boxes leads you through the process of modifying the Application Switcher's shortcut keys.

The Application Switcher has more advanced options, some of which you can control through AppleScript (see "The Many Faces of the Application Switcher"). For example, you can change the width of the Application Switcher window by dragging the right edge of any of its buttons. You can change the window orientation from vertical to horizontal by shift-option-clicking the zoom box, or change the icon size by option-clicking the zoom box. Using AppleScript, you can hide the window's title bar and frame and list programs in the order in which you opened them instead of alphabetical order. Mac OS 8.5 comes with three



The Many Faces of the Application Switcher Change the appearance of Mac OS 8.5's Application Switcher by dragging the right edge of any button or by clicking, option-clicking, or shift-option-clicking its zoom box. For some of the effects shown here, you must use AppleScript or one of the utility programs mentioned below.

starter AppleScript scripts for changing the Application Switcher; run these scripts by accessing Mac OS Help and clicking the underlined text at the very end of the Switching Between Open Programs section of Files And Programs.

There are also many free utilities for changing Application Switcher options. Of the five I looked at, AppSwitcher Control by pascal gives you the best control of the Application Switcher's keyboard shortcuts, but it responds slowly to your clicking and doesn't let you set less common options such as confining the Application Switcher to one monitor. Prestissimo from PolyMorph Software Development gives you less choice of keyboard shortcuts, but it responds quickly and lets you set the less common Application Switcher options. It also gives you more-flexible control of your 8.5 scroll bar configuration than you get with Mac OS 8.5's Appearance control panel. Other utilities include Dock Manager by Wade Cosgrove, SwitcherSetter by Chris Gervais, and Application Switcher Prefs from MaxConsulting.

Two-Sided Printing in ClarisWorks

TIP It's possible to print a multipage ClarisWorks or AppleWorks 5 word processing document on both sides of the paper without using QuickDraw GX or a printing-utility program. First,

open the document you want to print. Choose Document from the Format menu and turn on the Mirror Facing Pages option in the resulting dialog box; this matches the inside and outside margins on facing pages. I also like to select the Facing Pages Side-By-Side option in this dialog box to display pages side by side on screen. This doesn't affect printing but makes it easy to distinguish the right (odd-numbered) pages, which print on the front of the paper, from the left (even-numbered) pages, which print on the back.

Print the odd-numbered pages first by choosing Print from the File menu, selecting the Right Pages option, and clicking Print. Then reverse the order of the printed pages, turning them over so that page one is on top and facedown, page three is facedown under page one, and so on.

Next, place the printed pages back into the printer facedown, observing the correct page orientation for your printer. If the last page of the document is odd numbered, don't put it back into the printer—there's nothing to print on its back.

Finally, print the even-numbered pages by choosing Print from the File menu, selecting the Left Pages option, and clicking Print.

BRUCE FARAH
Eugene, Oregon

Depending on how your printer feeds paper, you may not need to reverse the order of the odd-numbered pages before putting them back into the printer.—L.P. **m**

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Mac OS 8.5 Bible* (IDG Books Worldwide, 1998).

All shareware and freeware mentioned in *Quick Tips* is available from the Macworld Online software library (www.macdownload.com).

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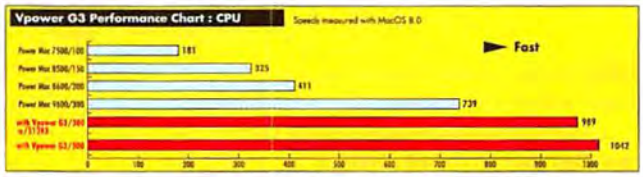

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Expert Tips: QuarkXPress 4

Industrial-Strength Techniques for Power Users

by David Blatner

The vast majority of desktop publishers simply don't have time to learn every nuance in a new piece of software. To get your work done on time, you probably just zero in on the major new features without stopping to pick up tricks and techniques. And too often it's the nonintuitive, underdocumented techniques that turn out to be most useful. But if you use QuarkXPress 4, you're in luck—you're about to learn some techniques that will both speed up your work and make the program a little more enjoyable to use.

Hands on the Keyboard

Keyboard shortcuts aren't particularly sexy, but learning to keep your hands on the keyboard is one of the best things you can do to work faster in QuarkXPress (or any program). For instance:

- ⌘-F opens the Find/Change palette; in version 4, ⌘-option-F closes it.
- ⌘-tab and ⌘-shift-tab select the next and previous tools, respectively, in the tool palette; in version 4, the same keystrokes also jump to the next or previous tab in a dialog box.
- XPress has some screen-redraw problems, often leaving pieces of objects on the screen after you've deleted or reshaped them. When you see such artifacts in version 4, you can force XPress to redraw the screen by pressing ⌘-option-period (.).

Confusingly, while version 4 retains all of version 3's keyboard shortcuts, some of them now work slightly differently. For example, ⌘-shift-backslash (\) used to open the Font Size dialog box. Now it opens the Character Attributes dialog box and highlights the Size field, which can be a much slower process when you have more than 20 or 30 fonts loaded. A clunkier but faster option is to use ⌘-option-shift-M (to jump to the Font field of the Measurements palette), press tab (to switch to the Size field), type the size, and press enter.

And the infamous Martian still makes an appearance when you delete an object with ⌘-option-shift-K, but in version 4 the same key combination occasionally releases a guy from Neptune, too.

Hidden Features

XPress 4 keeps several of its most useful features hidden away. For example, the program now offers contentless boxes—those containing neither pictures nor text—but hides the tools for creating them. The trick: ⌘-click on the Default Tool Palette button in the Tools tab of the Document Preferences dialog box (⌘-Y), and when you click on OK, contentless-box tools magically appear in your tool palette.

The new version contains other hidden gems to help you work faster. For example, you can now control-click on a tool in the palette to hide the tool inside a pop-out menu; holding down the control key and choosing a tool from a pop-out menu reverses the process, pulling the tool out of the menu and placing it in the palette proper.

One of the most popular features in QuarkXPress 4 is the ability to convert text into outlines. But if you hold down the option key when you select Text To Box, the outlined box actually replaces the original text and is auto-

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STEVE LYONS

matically anchored in the text box.

The option key brings all kinds of other hidden features to the surface. For example, when you've got two style sheets (either paragraph or character) and want to know how they differ, you can have XPress 4 compare them for you. Select both styles in the Style Sheets dialog box (shift-F11) by ⌘-clicking on each style. Then hold down the option key while clicking on the Append button (which becomes Compare when you press the option key). The result: QuarkXPress displays the definition of each style sheet, setting the discrepant attributes in bold. This trick works in the Colors and H&Js dialog boxes, too.

Keep Your Eyes Open

Sometimes we look at a dialog box and don't even notice the new features staring back at us. For example, the ability to rotate a picture in a picture box is nothing new, but XPress 4 also lets you rotate text in a text box. Just press ⌘-M, switch to the Text tab of the Modify dialog box, and change the Text Angle setting.

Similarly, one of the coolest new features in the Find/Change palette is easy to overlook: if you turn on Ignore Attributes, you can search and replace style sheets. That means, for example, that you can search for all the 11-point Helvetica text in your document and "replace" the attributes with a character-level style sheet. (This feature is a boon to anyone using run-in heads in their documents, because it's so much faster than applying the character styles manually.)

The best way to become really efficient in QuarkXPress 4 is to keep your eyes open and spend some time playing around with the program. But until you find the time to explore, these suggestions will help you speed up your production efforts—and maybe even enjoy your work just a little bit more. **m**

DAVID BLATNER is the author of the books *The QuarkXPress 4 Book* (Peachpit Press, 1998) and *Real World Photoshop 5* (Peachpit Press, 1999) and the video *QuarkXPress 4 Tips & Tricks* (Learnkey, 1998).

Ghosting Images in Text

SAY YOU WANT TO NOT ONLY PLACE TEXT OVER a picture but also have the image show through the text. The new version of QuarkXPress still doesn't offer transparency, but that doesn't mean you can't fake it—and doing so is not as hard as it might seem.

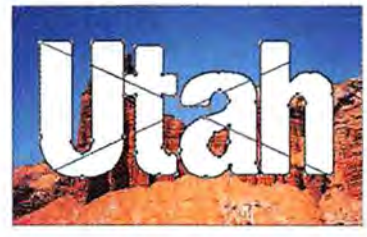
1. Select one line of text and choose Text To Box from the Style menu. (You can convert only one line of text at a time.)

2. Select the picture box behind the text, and use Step And Repeat from the Item menu to duplicate the image once with horizontal and vertical offsets of 0.

3. Modify the picture in this "clone" box (or import a new one). Here, I reimported the TIFF file while holding down the ⌘ key to convert the image to gray scale, and then picked a color from the Style menu.

4. Move the Bézier box that is shaped like the text outline into position, and then select it along with the duplicate picture below it.

5. Choose Item: Merge: Intersection, and voilà! The altered picture shows through the text.



Breaking the Box

YOU CAN EASILY CROP A PICTURE BY SHRINKING THE PICTURE box. And in QuarkXPress 4, you can clip a TIFF image by using the Clipping tab of the Modify dialog box. But have you ever considered cropping one part of an image and clipping another?

Note: The following technique requires you to build a path around the image in Adobe Photoshop before importing it into QuarkXPress.

1. To experiment with the clip-and-crop technique, let's say that you want to crop the lower two-thirds of this grocery bag and clip the background out of the top of the image.

2. In the Clipping tab of the Modify dialog box, choose Embedded Path from the Type pop-up menu. Then choose the path that includes all the parts of the image you want visible, even if it contains more of the foreground image than you need. Here, the clipping path includes the entire bread bag.

3. Set the size of the picture box so that it crops out the parts of the image you want to remove but leaves the rest of the image visible.

4. In the Clipping tab of the Modify dialog box, click on the Crop To Box button and uncheck Restrict To Box. Click on OK.

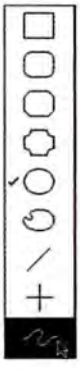
5. Finally, change the size of the picture box. (For some images, step 3 might require that you change the box to a Bézier box by choosing Item: Shape and then adding points. If you do this, remove those extra points now.)

Putting Text on a Circle

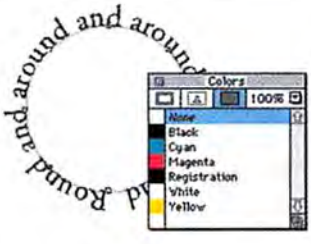
TRYING TO DRAW a perfect circle with QuarkXPress's Text Path Pen tools might give you a migraine. Instead, when you want to place text on a circle, follow these simple steps.

1. Draw a circular text box (hold down the shift key while dragging with the Oval Text Box tool to constrain it to a circle), and type some text in it.

2. While the text box is selected, choose the squiggly line from the Shape submenu (under the Item menu). This converts the box to a text path.



3. Set the color of the line to None (in either the Colors palette or the Modify dialog box). Otherwise, the line will print along with the text.



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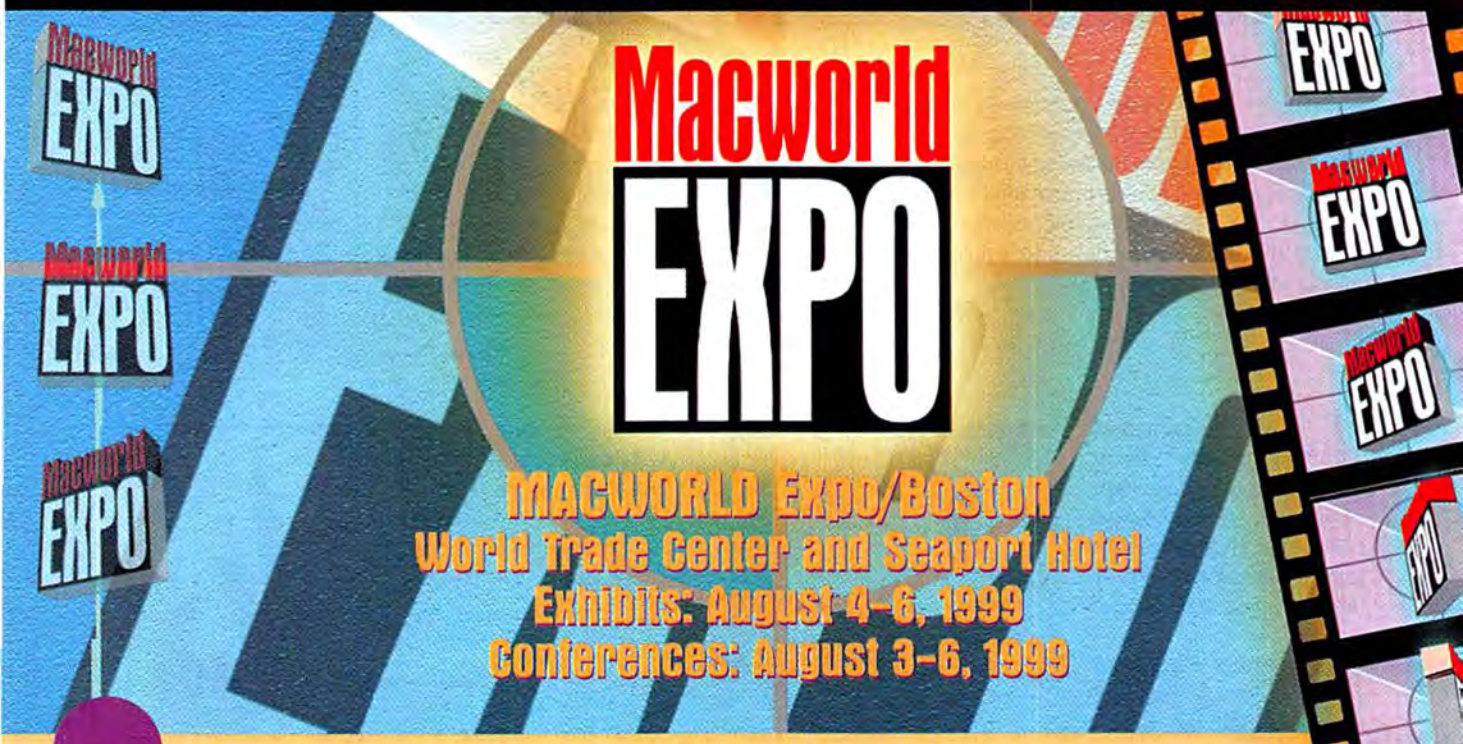

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Worst Web Faux Pas

Three Site-Structure Sins and How to Avoid Them

by Peter Morville

Everything about the Web seems to be growing exponentially: the market valuations of Web-based companies such as Yahoo and Amazon.com, the connection speeds, the number of Web sites and Web surfers—and the frustration of trying to find information in the sprawling chaos of cyberspace. Not only is it difficult to find the right Web site, but it's often hard to find what you're looking for *within* a site.

The problem is that our understanding of how to organize Web sites to help users navigate them is *not* increasing exponentially. As users, we spend vast quantities of time seeking but not finding. We browse through categories and subcategories, trying to guess where they've hidden our content; we enter terms into search engines and are amazed by the number of unrelated sites that result.

The good news is that the Web is a wonderful classroom for learning from the mistakes of others. As we browse and search poorly structured Web sites, we can convert our frustration as users into understanding as producers. The more we know exactly what it is we hate about the Web, the better equipped we are to avoid these problems and to design sites that help users find what they need. **m**

PETER MORVILLE is vice president of Argus Associates, an information architecture consulting firm, and coauthor of *Information Architecture for the World Wide Web* (O'Reilly & Associates, 1998).

Frustration 1:

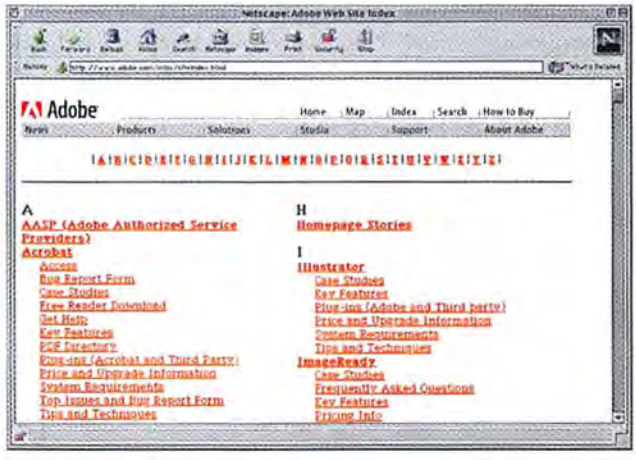
Difficult Navigation

WHETHER YOU'RE EXPLORING AN UNFAMILIAR CITY or a new Web site, there's nothing more frustrating than getting lost. In a city, you use street signs to figure out where you are and how to get where you're going; on a Web site, you rely on navigation bars, tables of contents, and search engines to find your way. By incorporating these tools into your site's navigation system, you can prevent visitors from feeling lost.

One such tool is the equivalent of a "You Are Here" symbol on a map: hyperlinks at the top or side of each page show where the user is in your site's hierarchy and how to return to a higher level (see "Virtual Bread Crumbs"). Other ways to provide contextual clues are to put your organization's name on every page and carry the main page's graphic identity throughout the site.

continues

Virtual Bread Crumbs The navigation bar near the top of the screen uses hypertext links that show visitors where they are in the site's hierarchy and help them jump quickly to higher-level categories.



Take the Express Users who know what they're looking for will find it quickly with this alphabetical site index. Notice that Adobe kept this page clean and almost image-free to get users to the desired content quickly and painlessly.

Frustration 1: *continued*

Other navigational tools use a printed-book metaphor. A table of contents, for example, offers a bird's-eye view of the hierarchy, helping users navigate quickly. Indexes, on the other hand, work well for users who know the name of the item they're looking for, allowing them to bypass the hierarchy altogether (see "Take the Express").

One tool that promises lots of bang for the buck is the search engine, which automatically indexes the full text of a site. However, a search engine can actually *decrease* visitors' ability to find what they're looking for; users often type in a keyword and receive a list of unrelated documents or the dreaded "no hits" message. One problem is that users and authors may use different words to describe the same concept (for example, *car* versus *automobile*). If you do put a search engine on your site, remember the "no dead-ends" rule: always provide links from the search-result screens to alternative ways of searching or browsing the site.

Frustration 2:

Chaotic Categories

SOMETIMES YOU VISIT A WEB SITE KNOWING EXACTLY what you're looking for, but you have a hard time guessing which link to follow from the main page. Other times you visit a site looking for information on a more general topic or seeking help with a certain task, only to be frustrated by an organization scheme that doesn't address either topics or tasks. In both cases, the site isn't organized in a way that helps you find the information you need. How can you learn from this frustration? The answer lies in understanding the difference between *exact* and *ambiguous* organization schemes and when to use each.

Consider the telephone book's white pages, which organize entries alphabetically by last name. When you know the last name of the person you're looking for, you know exactly where to find it. Applying this "known-item" searching to the Web, you can offer an alphabetical listing of products, services, or documents on your site to help visitors who know the name of the item they're looking for (see "Find It Fast"). Sites that offer geographic and chronological organization schemes also lend themselves to this kind of searching.

An exact organization scheme won't help you if your interest is topical or task based—try finding a plumber in the white pages. In an ambiguous organization scheme like that of the yellow pages, information is structured by topic, task, or audience, or according to a metaphor-driven scheme (see "Just Browsing").

By grouping similar items, ambiguous schemes suggest relationships you might not have considered. For instance, an ambiguous scheme can effectively suggest, "If you like this product, you might be interested in these related products and services." The problem is that no two designers structure or populate these schemes in quite the same way, so for all their value, they're often challenging to design, maintain, and use.

There are obvious pros and cons to both approaches: exact schemes work best for known-item searching, while ambiguous schemes help people who need topical information. The best strategy is to anticipate having both types of users visit your site. One of the advantages of organizing information in the digital rather than the physical world is that you're not limited to a single organization scheme; it's easy to give users multiple ways of accessing the same information.

Find It Fast The Internet Movie Database uses several exact organization schemes. You can easily search and browse by the names of movies or TV shows, cast or crew members, and characters.

Just Browsing Online bookstores like Amazon.com usually offer both exact and, as shown here, ambiguous organization schemes. This subject-oriented structure targets people looking for items on a particular topic rather than for a specific author or title.

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Frustration 3:

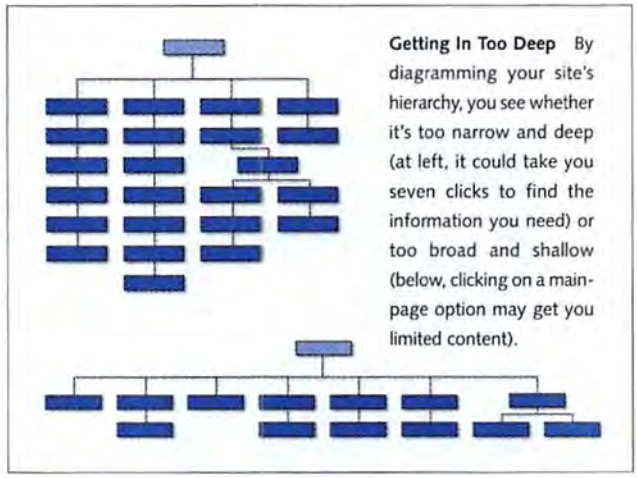
The Overwhelming Main Page

THE MAIN PAGES OF MANY CORPORATE WEB SITES are simply overwhelming, often crowded with 50 or more links (see "Option Overload"). The immediate effect is utter confusion—there are simply too many options from which to choose. Obviously, that's not a sensible way to welcome people to your site. Why does this happen, and how can you avoid it?

Confusing main pages are often the result of poor planning. Designers of such sites have failed to ask themselves the following critical questions at the outset:

- **What are the short- and long-term goals for the site?** For example, will the site offer only basic marketing materials at first but evolve to integrate product ordering and customer service as well?
- **Who is the primary audience and what are its members' most important needs?** Audiences for your site may include existing and prospective customers, investors, the media, business partners, or employees of your company. You can't meet all of their needs equally; you need to prioritize.
- **How can I define what content to include?** The larger an information system becomes, the harder it is to find anything in it. Try to develop policies that keep the focus on content of high value to your primary audience.

Without answers to these questions, most designers end up creating a site that strives to be all things to all people. A better approach is to apply the 80-20 rule: 20 percent of the content can usually meet 80 percent of users' most important needs. For example, financial-services companies find that 80 percent of visitors to their site simply need to check the status of their accounts, so it's important to provide fast access to that information. The remaining items on the site should be available if and when people decide they need it, but the focus should be on helping people quickly find the most important content.



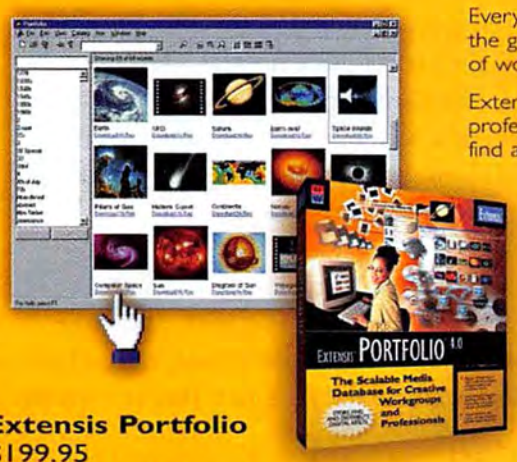
Getting In Too Deep By diagramming your site's hierarchy, you see whether it's too narrow and deep (at left, it could take you seven clicks to find the information you need) or too broad and shallow (below, clicking on a main-page option may get you limited content).

You also need to consider breadth versus depth. An overwhelming main page is too broad; an excess of options makes it difficult for users to choose the right one, and each category may contain very little content. But a narrow, deep Web site—one that requires five or six clicks to get to your destination—is even more frustrating than a broad, shallow one (see "Getting In Too Deep"). If you present options clearly, you can have as many as 32 on a main page. Studies show that users can navigate a 32-by-16 hierarchy (32 options on the main page and 16 options on each of the second-level pages) faster than an 8-by-8-by-8 hierarchy (8 options on the main page and on the second- and third-level pages). Breadth is much more acceptable when you've used alphabetical lists rather than a topical or subject-oriented hierarchy, where it's difficult to guess which category will lead to the desired item.

Option Overload It's not just the sheer number of links on this page that causes a problem, but also the types of links and their presentation. For example, putting options in navigation bars along both the top and left doesn't clearly establish a primary organization scheme. This makes it difficult for users to develop a mental model of the overall site.

Keep It Simple The Harley-Davidson Web site immediately establishes its primary organization scheme by presenting three major links. It's obvious that the site's designers thought carefully about what to include, how to group that content, and how to convey the right image. Another nice touch: you don't need to scroll to get to the most important information.

Digital Asset Management Software that Grows with Your Business



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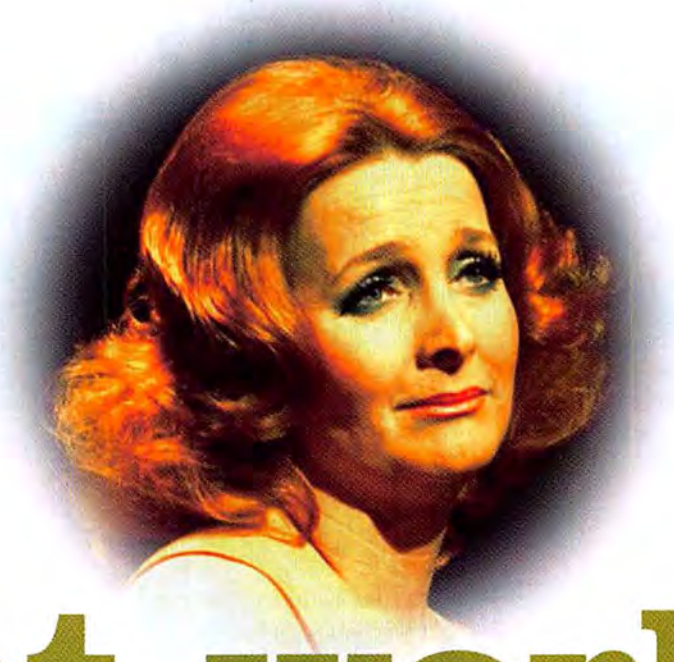

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Media Cleaner Pro 3 Expert Clinic

How to Make Your Web and CD-ROM Video Exceed Expectation

by Jim Heid

Preparing video for distribution on the Web or a CD-ROM can be downright depressing. You use top-notch gear to shoot your footage, digitize it onto a high-speed disk array, and edit and polish the final product until it glitters. But to put your video on the low-bandwidth realms of the Web or a CD-ROM, you have to compress it into a grainy, jerky clip that will make viewers wince. How does a quality-minded CD-ROM or Web video producer cope?

Having more control over the compression process is part of the answer, but you also need to master the black art therein. Currently no program provides more control over compression than Terran Interactive's Media Cleaner Pro (MCP), whose broad array of features enables you to get the highest possible quality and the smallest possible file sizes. MCP also dovetails particularly well with Apple's QuickTime 3 and the Sorenson Video compression technology that accompanies it (see "Harnessing a New Codec").

On the following pages are a multitude of tips, tweaks, and techniques for mastering the finer aspects of compression with MCP 3 to achieve the ultimate balance of clean, lean, and beautiful video. Unless otherwise noted, everything here applies to both CD-ROM and Web video production.

Beyond the Wizard

If you're a compression newbie, MCP's Settings Wizard walks you through the process of specifying compression settings, asking you questions about a movie's destination and content. But the wizard doesn't give you access to MCP's best quality controls; you access these via the Advanced Settings window (see "Where the Tweaks Live"). To display the Advanced Settings window, choose Advanced Settings from the Windows menu.

Saving Settings Media Cleaner Pro lets you save collections of compression settings so you can apply them instantly to other movies. A saved collection of settings is called, remarkably enough, a *setting*. MCP includes dozens of canned settings for common tasks, but chances are you'll want to fine-tune them for your specific needs. When you do, use the Advanced Settings window's Save As button to save your customized setting under a new name. This keeps the original setting intact as a starting point for future efforts.

Sharing Settings If you have multiple machines running their own copies of Media Cleaner Pro, you can move cus-

continues

Masking and Watermarking

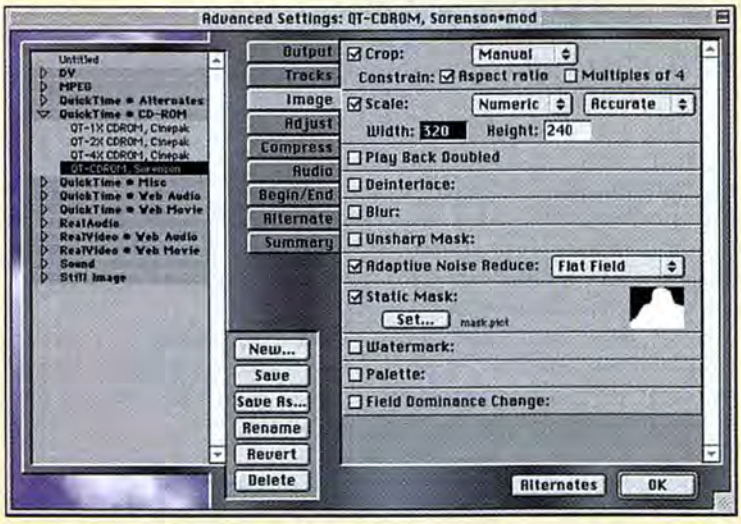
SIMPLIFY YOUR CODEC'S CHORE: ELIMINATE HARD-TO-COMPRESS NOISE BY creating a mask and using Media Cleaner Pro's Static Mask feature. You can also create a watermark—for example, add your company logo to a movie's lower-right corner—using a similar technique.

1. From within a video-editing program, Apple's MoviePlayer utility, or Media Cleaner Pro, export a representative frame of your movie as a PICT file.

2. Open the PICT file in Adobe Photoshop and create a new layer. In this layer, use the paintbrush tool to paint out areas in the background layer that don't change between frames.

3. Hide the background layer by clicking its eye icon in the Layers palette, and use the Save A Copy command to save this mask as a PICT file. In Media Cleaner Pro's Advanced Settings window, click on the Image tab, check the Static Mask box, and use the Set button to specify the PICT mask you just created.

Where the Tweaks Live



MEDIA CLEANER PRO'S ADVANCED SETTINGS WINDOW IS THE GATEWAY to the power tools; each tab provides options for compression, cropping, audio processing, and more.

tomized settings between machines. Simply copy the appropriate settings files from the Media Cleaner Settings folder, found in the Media Cleaner Pro 3 folder. Better still, stash a Media Cleaner Settings folder on a file server, create an alias of it, and replace each machine's Media Cleaner Settings folder with the alias. Now each machine's copy of Media Cleaner Pro will access the settings folder on the server.

Locking Settings You've arrived at the perfect combination of settings for a given project and created a new settings file. To ensure that you don't accidentally change the settings, use the Finder's Get Info window to lock the settings file.

The Gamma Gap

Web designers are (or should be) intimately familiar with Windows' gamma issue: Mac-created graphics often look too dark in Windows because PC monitors have a different gamma curve than Macs. The same applies to video clips.

Media Cleaner Pro makes gamma adjustments a cinch. With the desired setting selected in the Advanced Settings window, click on the Adjust tab and check the Gamma box. Move the slider to the right to brighten the movie.

Start at Thirtysomething What's the best gamma adjustment for optimum Windows playback? That depends on your movie, but a good starting point is 30. In general, if the movie looks a bit too light on your Mac's monitor, it will look good on a PC.

Consider Platform-Specific Movies If you're creating movies destined for playback in QuickTime 3, consider creating two separate gamma-corrected movies, one for the Mac OS and one for Windows. Page 114 of the Media Cleaner Pro manual contains a cool tip for using QuickTime 3 reference movies to deliver separate movies transparently to Mac OS and Windows users.

Harnessing a New Codec

The Sorenson compressor/decompressor from Sorenson Vision (www.s-vision.com) that accompanies QuickTime 3 provides smooth, sharp playback at much lower data rates than the venerable Cinepak codec does. But Sorenson brings new issues to the table, and applying Cinepak techniques to Sorenson often yields disappointing results. Getting the best results from Sorenson means, well, thinking different.

Where's It Going? For a Web-destined movie, first decide whether it's important for it to stream in real time—that is, to begin playback almost immediately and to play without pause as the file downloads. For short movies—say, 30-second clips—consider forgoing immediate gratification in the interest of better compression quality.

A movie compressed with a data rate of about 10K to 20K per second and a frame size of 240 by 180 pixels might take about a minute to load before playback begins. But the larger frame size and higher image quality may make that wait worthwhile. And if you put text on the page containing the movie, viewers will have something to distract them while the movie loads.

For movies destined for CD-ROMs, try a data rate of about 100K per second, with a 320-by-240 frame size and a 15-fps frame rate.

Keep the Red Out A strange quirk of Sorenson's underlying compression scheme is that brightly saturated reds compress poorly. Titles consisting of red text against a black background are likely to look particularly bad. Consider avoiding bright reds in clips that you'll be compressing with Sorenson.

The Key to Keyframes With Cinepak, it's common to specify one keyframe every second. (A keyframe contains the complete video image; between it and the next keyframe are *delta* frames containing only those pixels that change.) Sorenson doesn't need as many, and gives better results if you specify one keyframe every ten seconds or so.

Going Upscale The Sorenson codec that accompanies QuickTime is just a subset of the compression marvels that Sorenson Vision has created. The $499 Sorenson Developer Edition provides several additional compression features, some of which are accessible only through Media Cleaner Pro (see *Reviews*, November 1998).

The most noteworthy of the goodies in Developer Edition is *variable bit-rate* (VBR) encoding, which adjusts data rates on the fly to deliver the best quality for the scene at hand. VBR works particularly well with material that alternates between periods of low and high activity—for example, a title dissolving into a fast-motion scene.

One caveat you should be aware of is that VBR can increase compression time by a factor of three, so build a little extra time into your postproduction schedule if you plan to use it.

Now Previewing

MEDIA CLEANER PRO 3.0'S DYNAMIC PREVIEW WINDOW lets you evaluate the effects of your compression and optimization settings before you actually compress the movie. Its split-screen approach provides a before-and-after view of your settings.

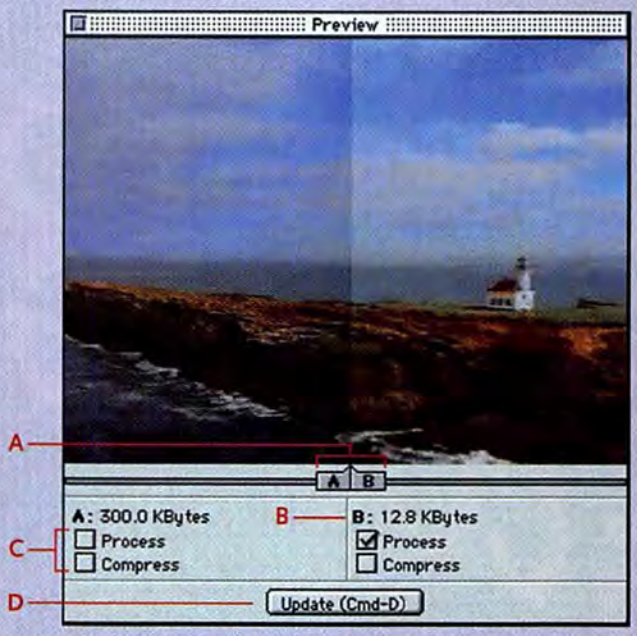
To display the window, choose Dynamic Preview from the Windows menu (or press ⌘-D). The window shows the same frame that's displayed in the Source window; to display a different frame, activate the Source window by clicking on it and drag the QuickTime controller bar to the desired frame.

Drag the slider (A) to the left or right to change where the screen splits. Media Cleaner Pro also displays the approximate size of the currently displayed frame (B) so you can assess the shrinking skills of your chosen codec.

To preview the results of your optimization settings, check the right-hand Process box in the collection of four check boxes (C).

To preview noise reduction, check both Process and Compress on the right. Now both sides of the preview show the clip in its compressed form, but only the right side shows optimization and image-tweaking results. This lets you see how your settings will affect the quality of the final output.

To preview everything, check the Compress box on the left and both the Process and Compress boxes on the right. Now the left side of the preview window shows the original clip, and the right side shows how the final output will look. This preview mode is the slowest but gives the most accurate glimpse of your final product.



A Handy Sneak Peek Media Cleaner Pro's Preview window lets you see how your selection of settings will affect the final output before you commit to them.

TIP If you see that your chosen codec is altering the image's color balance, go into the Advanced Settings window and tweak the Hue and Saturation sliders under the Adjust tab until the color balance of both sides is the same. Then click on Update (D) or press ⌘-D to update the preview.

Bonus Refinement Tactics

There are additional ways to improve compression and minimize its artifacts. Assess the results of each tweak in Media Cleaner Pro's Dynamic Preview window (see "Now Previewing").

Turn Down the Noise Video noise—especially apparent in dimly lit scenes—compresses poorly. In the Advanced Settings dialog box, check the Image tab's Adaptive Noise Reduce box to apply a noise-reduction filter. The default option, Flat Field, is usually best.

You compression old-timers may be tempted to check the Blur box, since applying a slight blur to a clip was a common technique to improve Cinepak compression. But resist the urge to blur—adaptive noise reduction provides the same benefits but does a better job of preserving edge sharpness.

Tweak the Contrast Boosting a clip's contrast slightly can improve compression by making almost-black areas completely black. Check the Adjust tab's Contrast box, and drag its slider to the right 10 to 15 units.

Mask Your Talking Heads For talking-head movies, consider using the Image tab's Static Mask feature (see "Masking and Watermarking"). By masking out areas that don't change from one frame to the next, you eliminate hard-to-compress video noise, enabling your codec to concentrate on compressing the movie's main subject.

Crop the Garbage When you capture video from an analog videotape, the resulting movie is likely to have several rows of dancing pixels at the bottom. This garbage gives your movie an amateurish look, and those dancing pixels are hard to compress. Use Media Cleaner Pro's crop feature to remove extraneous junk; you can enter numeric values in the Advanced Settings window's Image tab, or open the movie's Source window and draw a crop rectangle.

Get Inflatable Assistance So few software developers use the Mac OS's balloon-help feature that you probably have never bothered to try it. Well, surprise: Terran Interactive has filled Media Cleaner Pro's balloons with tips and succinct instructions. Check them out.

One of the best bits of advice, naturally, is to aim high at the outset. Media Cleaner Pro is a power tool, not a miracle worker. It can't compensate for a bargain-basement camcorder, poor lighting, and an overcaffeinated camera operator. So keep in mind the standard rules of Web and CD-ROM video: use quality gear, light well, minimize panning and zooming, and use a tripod. **m**

A contributor to *Macworld* since 1984, JIM HEID (www.heidsite.com) writes and lectures about Web, video, and multimedia development.

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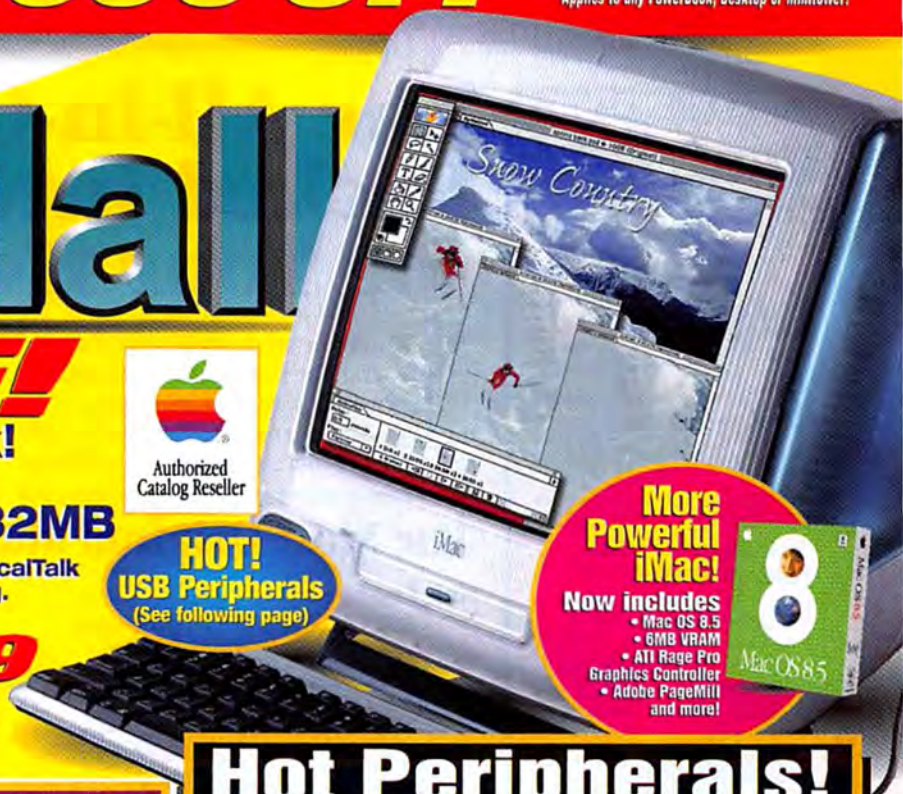

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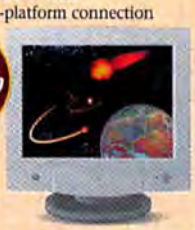

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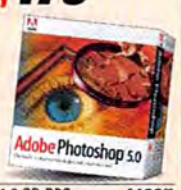

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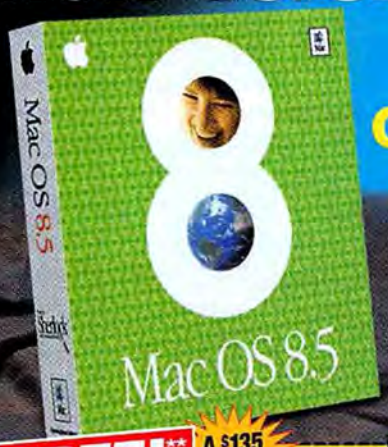

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SONY

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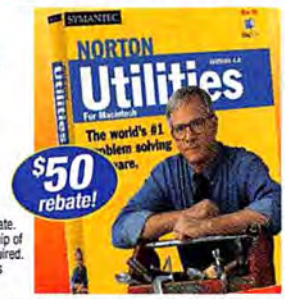

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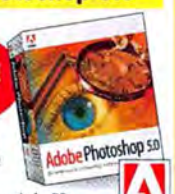

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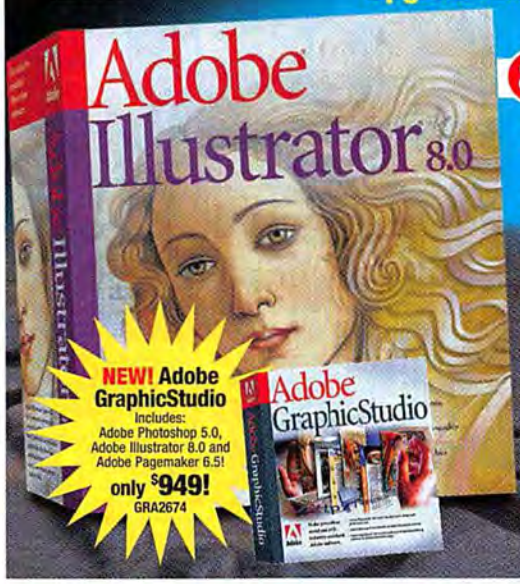

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APS I 9100 Ultra Wide SCSI

- 10,000 rpm 9.1GB drive from the developers of the hard drive
- Top performance for graphics and video editing workstations, demanding servers

For the absolute maximum hard drive performance on an Ultra Wide SCSI-based system, ramp up with the APS I 9100 W. Based on the Ultrastar 9ZX mechanism, this drive offers seek times as low as 6.3ms and very high sustained data transfer rates (up to 17MB/s). The I 9100 W is more than capable of handling your most demanding server functions. Upgrade your high-performance workstations and servers to the power of one of the fastest mechanisms in the world with the APS I 9100 W.

As low as $579.95
EL Configuration

APS I 4500 Ultra Wide SCSI

- 7200 rpm drive with 4.5GB capacity handles virtually all of your business' needs
- Top price/performance for high-end corporate workstation, small server

This Ultrastar-based drive combines amazing value with top performance for a wide range of business applications. At prices like these, the Ultrastar Series may be the best corporate storage value in the industry. Call today to order.

As low as $289.95
EL Configuration

APS ST 4000 Ultra Wide SCSI

- Inexpensive 7200 rpm drive lets home/small offices tackle demanding business projects
- Faster and longer lasting than predecessor

This drive tears through your personal and home business projects without draining your wallet. At 7200 rpm, the Medalist Pro mechanism lets you tackle demanding business projects that might cripple your older hard drive. Get a lot of drive for not a lot of money with an APS ST 4000 W.

As low as $249.95
EL Configuration

APS ST 9000 Ultra Wide SCSI

- Third-generation Barracuda 7200 rpm drive with 9GB capacity
- Optimized for multi-user graphics and A/V environments

The Barracuda gives you blazing fast data transfer rates for graphics, prepress and multimedia applications in client/server environments. Features advanced technology like magneto-resistive, next-generation thin-film heads and increased areal density. All of which lets you be more productive.

As low as $519.95
EL Configuration

APS Q 4500 Ultra Wide SCSI

- New 7200 rpm mechanisms have 30% faster internal data transfers
- Up to 11.5 MB/s sustained transfers and Ultra Wide SCSI for workstations, workgoup servers

The new Viking II series improves upon the original corporate favorite to give you top performance and great value. These drives boast high buffer-to-host (external) sustained data rates, and they contain fewer moving parts for greater reliability and longevity. When you want to upgrade your workstation or small server storage, you can count on the Viking II series.

As low as $289.95
EL Configuration

APS Q 18,000 Ultra Wide SCSI

- 7200 rpm and over 18GB for departmental and enterprise servers
- 1MB cache, average seek time of 7.8ms and 12MB/s transfers

A superb choice for corporate server storage. The high-performance, dual-microprocessor architecture of the new Atlas III makes this drive ideal for demanding business applications. The highly-automated manufacturing process ensures your business receives the highest data integrity and longest expected drive life.

As low as $969.95
EL Configuration

APS I 9000 Ultra Wide SCSI

- Blazing Ultra Wide SCSI drive from the inventors of the hard drive
- 9GB capacity for video, departmental and workgroup servers
- 7200 rpm Ultrastar mechanism

The APS line of Ultrastar drives with Ultra Wide SCSI interfaces can boost productivity throughout your network. Excellent seek times and data transfer rates.

As low as $509.95
Internal Configuration

APS ST 9100 Ultra2 Wide SCSI

- 10,000 rpm and Ultra2 Wide SCSI for fastest performance ever
- 9.1GB drive powers multimedia, 3D, engineering, animation and digital video

This drive is among the fastest available today. Period. Get the ultimate performance from your data-intensive workstations, including non-linear video editing stations. You can also power up your most demanding servers. This Cheetah-based drive races through the most demanding tasks – a must-have for professional digital content creators.

As low as $739.95
Internal Configuration

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more than just a drive?

A great enclosure makes all the difference

The APS Pro enclosure gives you a combination of features that no one else offers. Like a powerful 40W universal power supply that helps your drive spin up to full speed. A full-metal RF/EMI shield that protects your data from interference from your other devices. A huge 60x60mm fan and patented IC²E® drive-cooling technology to keep even 10,000 rpm drives from overheating. And patented DATerm® (digital active termination) for smoother SCSI communications with other drives and your CPU. So demand APS drives in the exclusive APS Pro enclosure. Anything else is just a drive.

Macworld Expo Specials

APS ST 4000 $229.95
Ultra SCSI Medalist Pro

APS ST 9000 $399.95
Ultra SCSI Medalist Pro

APS ST 9000 Ultra2 Wide SCSI

- 7200 rpm drive with Ultra2 Wide SCSI
- 9GB capacity for servers, pro workstations

These 7200 rpm mechanisms provide corporate-size storage and high-performance for servers and high-end workstations. With internal data transfer rates of up to 17MB/s and an Ultra2 Wide SCSI interface, the Barracudas race through data-intensive projects like multimedia and imaging.

As low as $539.95
Internal Configuration

APS Q 4500 Ultra2 Wide SCSI

- Jump into Ultra2 SCSI with dependable 7200 rpm Viking II
- 4.5GB for corporate workstations

The Viking II Series offers solid performance and reliability for your executive-level workstations. This line also offers advanced multi-layer data integrity features and high internal data transfer rates.

As low as $299.95
Internal Configuration

APS 2.1GB Ultra ATA

- Ultra ATA interface keeps up with fast hard drives with 33MB/s transfers
- Always the best price/performance available
- Excellent choice for basic desktop needs

Save time, save effort AND SAVE MONEY with the APS Ultra ATA series of drives. When all the drive mechanisms out there don't vary by more than 5% or so in performance, why drive yourself crazy trying to make a buying decision? We've done the research for you, picking the best Ultra ATA storage options from the world's premier mechanism manufacturers, all at awesome prices. You always get the best price/performance possible with an APS Ultra ATA drive.

As low as $119.95
Internal Configuration

APS ULTRA SCSI HARD DRIVES

Model	Description	EL	Int.	Pro
APS Q 2000	Quantum Fireball SE, 2079MB, 5400 rpm	$209[EL]	$219[EL]	$279[EL]
APS Q 3000	Quantum Fireball ST, 3118MB, 5400 rpm	229[EL]	239[EL]	299[EL]
APS Q 4000	Quantum Fireball ST, 4136MB, 5400 rpm	269[EL]	279	$339[EL]
APS ST 4000	Seagate Medalist Pro, 4527MB, 7200 rpm	229[EL]	239[EL]	299[EL]
APS I 4500	IBM Ultrastar, 4357MB, 7200 rpm	279[EL]	289[EL]	349[EL]
APS Q 6400	Quantum Fireball ST, 6236MB, 5400 rpm	359[EL]	369[EL]	419[EL]
APS ST 6000	Seagate Medalist Pro, 6580MB, 7200 rpm	369[EL]	379[EL]	439[EL]
APS Q 8000	Quantum Fireball SE, 8191MB, 5400 rpm	429[EL]	439[EL]	499[EL]
APS I 9000	IBM Ultrastar 9ES, 8715MB, 7200 rpm	439[EL]	509[EL]	569[EL]
APS ST 9000	Seagate Medalist Pro, 9140MB, 7200 rpm	399[EL]	409[EL]	469[EL]
APS I 18000	IBM Ultrastar, 17501MB, 7200 rpm	949[EL]	959[EL]	1,019[EL]
APS Q 18000	Quantum Atlas II, 17366MB, 7200 rpm	959[EL]	969[EL]	1,029[EL]

APS HIGH-PERFORMANCE ULTRA2 WIDE SCSI HARD DRIVES

Model	Description	Int.	Pro
APS Q 4500 U2W	Quantum Viking II, 4240MB, 7200 rpm	299[EL]	$369[EL]
APS Q 9000 U2W	Quantum Viking II, 8682MB, 7200 rpm	519[EL]	589[EL]
APS ST 9000 U2W	Seagate Barracuda, 8683MB, 7200 rpm	539[EL]	609[EL]
APS ST 9100 U2W	Seagate Cheetah, 8681MB, 10,000 rpm	739[EL]	809[EL]
APS ST 18100 U2W	Seagate Cheetah, 18201MB, 10,000 rpm	1,229[EL]	1,299[EL]

APS HIGH-PERFORMANCE ULTRA WIDE SCSI HARD DRIVES

Model	Description	EL	Int.	Pro
APS ST 4000 W	Seagate Medalist Pro, 4520MB, 7200 rpm	$249[EL]	$259[EL]	$339[EL]
APS I 4500 W	IBM Ultrastar 9GS, 4357MB, 7200 rpm	289[EL]	299[EL]	379[EL]
APS Q 4500 W	Quantum Viking II, 4345MB, 7200 rpm	289[EL]	299[EL]	379[EL]
APS ST 6000 W	Seagate Medalist Pro, 6520MB, 7200 rpm	379[EL]	389[EL]	469[EL]
APS I 9000 W	IBM Ultrastar 9ES, 8715MB, 7200 rpm	509[EL]	519[EL]	599[EL]
APS Q 9000 W	Quantum Viking II, 9000MB, 7200 rpm	509[EL]	519[EL]	599[EL]
APS ST 9000 W	Seagate Barracuda, 8683MB, 7200 rpm	513[EL]	529[EL]	609[EL]
APS I 9100 W	IBM Ultrastar 9ZX, 8705MB, 10,000 rpm	579[EL]	589[EL]	669[EL]
APS I 18000 W	IBM Ultrastar 18XP, 17501MB, 7200 rpm	959[EL]	969[EL]	1,049[EL]
APS Q 18000 W	Quantum Atlas III, 18201MB, 7200 rpm	969[EL]	979[EL]	1,059[EL]
APS ST 18000 W	Seagate Barracuda, 18000MB, 7200 rpm	889[EL]	909[EL]	989[EL]

APS ATA HARD DRIVES

Model	Description	Internal
APS 2000 ATA	5400 rpm	$119[EL]
APS 4000 ATA	5400 rpm	149[EL]
APS 6000 ATA	5400 rpm	179[EL]
APS 10000 ATA	5400 rpm	229[EL]
APS 12000 ATA	5400 rpm	279[EL]

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"Although I have purchased drives from other vendors, I have yet to find the levels of service and support both before and after the sale as I have experienced while working with APS. I have even had help on restoring lost data. I choose APS because I know that if I need a product fast, well made, and a company to stand behind it, there is no one else to call."

John P. Grace
Abbott Laboratories Research

APS HyperQIC®

- Up to 8GB per TR-4 tape with new NS8 hardware compression
- The worldwide standard in desktop backup is now better than ever

Our HyperQIC drive uses Travan-4 tape cartridges to deliver up to 4GB on a single tape without compression! (8GB with 2:1 data compression.) The APS HyperQIC is read/write compatible with QIC3095 and QIC3080 cartridges. This drive can also read QIC80, QIC3010, and QIC3020 tape cartridges. The APS HyperQIC includes backup software and a two-year limited warranty.

(While the APS HyperQIC will accept all of the media listed, compatibility issues with the software used to record those tapes may make it impossible for you to read those tapes with your current backup software.)

As low as $299.95
Internal Configuration

APS HyperQIC® II

- Brand-new Travan-5/NS20 technology – safeguard up to 20GB per cartridge
- Hardware data compression for faster, more efficient backups

Next-generation Travan-5 cartridges give you up to 20GB compressed (10GB native) capacity. That's two and a half times more storage than previous Travan media. And new Travan NS technology adds hardware compression for more efficient data compression and faster transfers. If you need reliable, fast backup for a desktop or workstation, move up to the APS HyperQIC II. Includes backup software for Macintosh (Retrospect or NovaBack) or Windows (NovaBack and Cheyenne).

As low as $499.95
Internal Configuration

APS TAPE BACKUP SYSTEMS

Model	Description	Internal	External
APS HyperQIC®	Travan 4, QIC 3095, NS-8	$299[95]	$349[95]
APS HyperQIC® II	Travan 5, QIC 3220, NS-20	499[95]	549[95]
APS HyperDAT®	DDS-2DC, 8GB	549[95]	599[95]
APS HyperDAT® Pro	Quad-speed DDS-2DC, 8GB	699[95]	749[95]
APS HyperDAT® II	DDS-3DC, 24GB	979[95]	1,049[95]
APS HyperDAT® IV	DDS-4DC, 40B	1,349[95]	1,399[95]
APS Mini Library	4mm DDS-2 AutoLoader, 64GB	N/A	2,399[95]
APS DLT40	DLT 4000, 40GB	N/A	2,579[95]
APS DLT70	DLT 7000, 70GB	N/A	5,699[95]
APS AIT	8mm W/DC, 50GB	N/A	2,399[95]
APS AIT Autoloader	8mm, 200GB on 4 tapes	N/A	4,799[95]

Order from our special Online Catalog @ http://www.apstech.com/mwspecial/

APS HyperDAT® IV

- Longer tape, higher density vault DDS-4 into corporate network backup
- 20GB native capacity, 2-3MB/s transfers

If you trust your desktop and workstation backup to DDS, but it doesn't meet your server or workgroup needs, it's time to take a second look. New DDS-4 technology has increased capacity by 67% over DDS-3 and shrunk your backup time in half. DDS-4 uses longer tapes with thinner tracks and improved durability. But the HyperDAT IV can read and write to your DDS-3 and even DDS-2 tapes, so migration is easy.

As low as $1349.95
Internal Configuration

APS HyperDAT®

- Up to 8GB of storage on one 120m DDS-2/DAT tape
- Excellent desktop/workstation backup

Delivering backup speeds as high as 28MB per minute, this DDS-2 backup system can pack up to 8GB on a single 120m DAT tape! The APS HyperDAT can also use 60m or 90m DDS tapes. Comes with backup software and a limited two-year warranty.

As low as $549.95
Internal Configuration

APS HyperDAT® III

- 12GB native backup for high-end workstations, entry-level networks
- New, more reliable DDS-3 technology

The APS HyperDAT III provides a cost-effective solution to the backup storage needs of data-intensive systems. Using DDS-3 technology, the APS HyperDAT III delivers a narrower track width than DDS-2 for a much higher density and more data storage. The increased density combines with Sony's precise tape control system to deliver a sustained data transfer rate of 1MB per second.

As low as $979.95
Internal Configuration

APS HyperDAT® Pro

- Backup and restore speeds as high as 50MB per minute
- Up to 8GB of storage per 120m DAT/DDS-2 tape cartridge

Backup in less time! The APS HyperDAT Pro is perfect for high-end desktop backups. With standard 120m DDS-2 tapes the APS HyperDAT Pro can backup up to 8GB of data (assuming 2:1 hardware compression). The HyperDAT Pro can also use economical 60m and 90m tapes. Comes with backup software and includes a two-year warranty.

As low as $699.95
Internal Configuration

Drives on these pages are covered by the APS 30-Day Money-Back Guarantee.

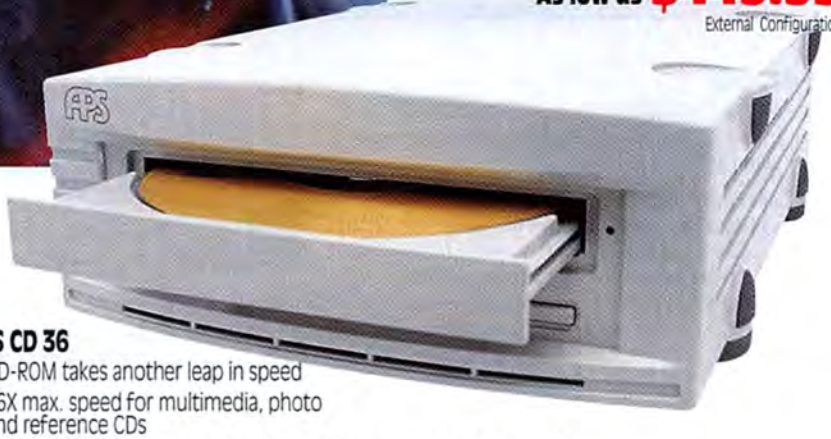
distribute your projects faster

APS CD-RW 4x4x16

- 167% faster reads and 100% faster rewrites than CD-RW Pro 4x2x6
- The ultimate rewritable CD drive for professional creative environments

APS proudly introduces our fastest rewritable CD drive ever. The 4x4x16 is fast enough to handle all CD functions, including 16X reads for power users. This tray-loading drive offers a huge 2MB buffer to prevent underruns and failed recordings. The 4x4x16 is Flash ROM-upgradeable for future formats and operating systems. Plus, you get full-featured, professional-level recording software for both Mac and PC. No matter if you develop demanding multimedia or software, produce music or graphic designs, the CD-RW 4x4x16 is the only CD drive you need.

As low as $449.95
External Configuration



APS CD 36

- CD-ROM takes another leap in speed
- 36X max. speed for multimedia, photo and reference CDs
- Reads all CD formats, including CD-RW discs

The CD 36 takes you to the next level. Based on a 36X mechanism, this drive can transfer data up to 5.4MB/s, as fast as many hard drives. This CD reader understands all of your discs, too, including custom CD-R and CD-RW discs. Available in our economical Slimline enclosure. Whether you are looking to give your business an edge or just want to enjoy uninterrupted multimedia titles, the APS CD 36 delivers.

As low as $149.95
External Configuration

APS CD-R 4x12

- Excellent price/performance
- Top value for multimedia producers, music, design and prepress pros

The APS CD-R 4x12 is one of our best recordable CD values. With 12X read and 4X write capabilities, you can burn multimedia and audio CDs at 1X, 2X or 4X speeds in any standard recording format. Includes all the CD recording software you need.

As low as $349.95
External Configuration

APS CD-R 4x8

- Excellent value for burning CDs for personal or small business uses
- Includes PC/Mac recording software

The APS CD-R 4x8 gives you excellent price/performance for CD production at home. Powered tray-loading eliminates inconvenient caddies.

As low as $269.95
External Configuration

APS CD-R 8x20

- Super-speedy CD burner for creative professionals
- 8X record/20X read mechanism
- Includes full-featured CD recording software for Mac and PC

Hit the afterburner! The CD-R 8x20 is our fastest CD recorder ever. The blazing 8x20 mechanism cranks out your CDs in record time, so you spend less time burning and more time creating. If your payday depends on producing CDs, punch in with the APS CD-R 8x20.

As low as $649.95
External Configuration

APS CD-RW 2x2x6

- Record, read, and edit any kind of data on CD-RW media
- Also records on inexpensive, play-anywhere CD-R discs

Whether you're producing a multimedia title or just want to send your mother a QuickTime movie of your honeymoon, this versatile drive is the perfect solution for mastering and reusing CDs. CD-RW discs can be rewritten up to 1,000 times and have an expected life of 30 years, so you get the most from your investment. The APS CD-RW 2x2x6 also writes to cost-effective CD-R discs. And it can read video, audio, multimedia and photo CDs.

The APS CD-RW continuously monitors the signal level and adjusts the laser power to improve reliability during recording. This drive provides 2X recording, 2X rewriting, and 6X playback. The APS CD-RW drive includes all the Mac and PC recording software you need to master your CDs. Ships in the APS Pro enclosure.

As low as $349.95
External Configuration

APS CD-ROM/R/RW DRIVES & MASTERING SYSTEMS

Model	Description	External
APS CD36	36X CD-ROM in Slimline Case	$149[95]
APS 5-CD Changer	Nakamichi 5 Disc/16X CD-ROM, Pro Enclosure	259[95]
APS CD-R 4X8P	4X record/8X read CD-R in SR 2000 or APS Pro Enclosure	279[95]
APS CD-R 8X20	8X record/20X read CD-R in Pro Enclosure	649[95]
APS CD-R 4X12	4X record/12X read CD-R in Pro Enclosure	379[95]
APS CD-RW	2X record/2X rewrite/6X read CD-RW in Pro Enclosure	379[95]
APS CD-RW	4X record /4X rewrite/16X read CD-RW in Pro Enclosure	449[95]

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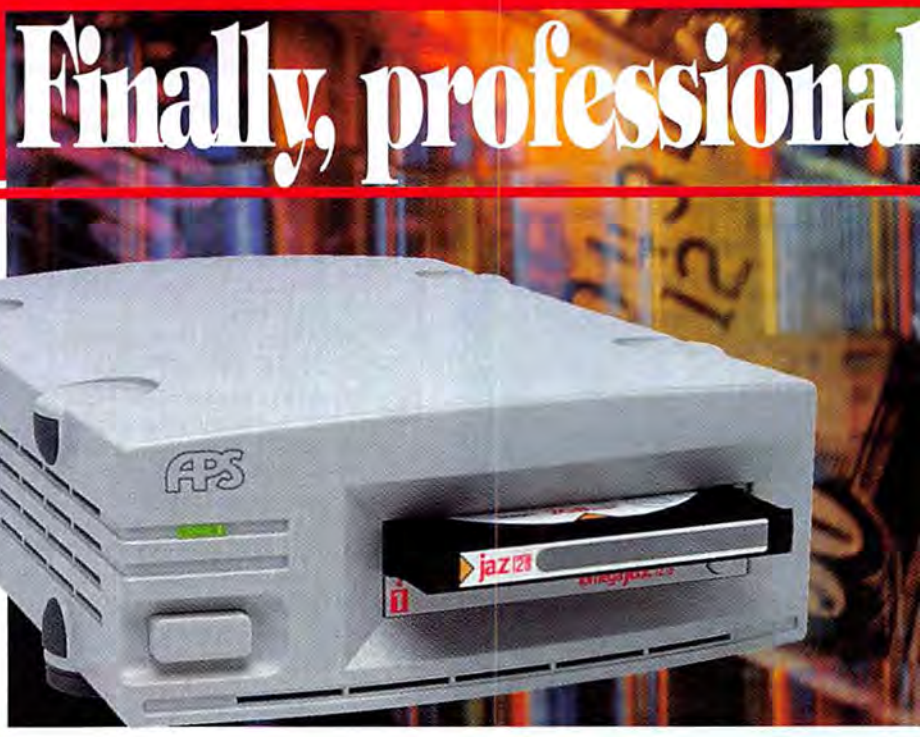

APS Jaz II

- A staggering two gigabytes of removable storage
- Perfect for digital video professionals and service bureaus

MW EDITORS' CHOICE

Introducing the next big thing: the APS Jaz II. Based on revolutionary Jaz technology, this drive offers a whopping two gigabytes of removable storage. And the new Jaz II is even faster, coming closer still to hard drive access and read/write speeds. This drive will also read and write to your current 1GB Jaz disks, so you don't have to worry about wasted investment. For digital video, multimedia and publishing businesses, the APS Jaz II is perfect for carrying huge files and quickly accessing client data. It's time to move up to the APS Jaz II. Includes one disk.

As low as $399.95
External Configuration

LaCie EKO Jaz II

- 2GB Jaz drive in intelligent EKO case
- Built-in power supply eliminates extra equipment
- Internal fan keeps drive and disks cool

The LaCie EKO Jaz II takes the original and makes it better. It's even more portable than Iomega's own, since you don't need to lug around a power supply. And it includes an internal fan, unlike the original, that keeps the drive and its disk cool even at full speed. The LaCie EKO Jaz II also accepts Jaz 1GB disks. So if you want the portable powerhouse that's better than the original, order the LaCie Jaz II.

As low as $299.95
External Configuration

APS 640 MO

- Read/write compatible with 640, 230 and 128 MO
- New Direct OverWrite technology cuts rewrite time in half with LIMDOW MO disks

Stunning formatted capacity of up to 606MB on 3.5" 640 MO media. Store large graphics and database files and transport large amounts of data when traveling. Sustained reads of up to 2.19MB per second and sustained writes of up to 6.28MB per second, plus LIMDOW technology eliminates the erase cycle of rewriting. Available externally in the APS Pro enclosure with DATerm and our patented IC²E technology. Backed by one-year limited warranty.

As low as $349.95
External Configuration

Sony MVC-FD81/91 Digital Mavica Cameras

- Convenient digital cameras capture photos and video
- Store and transfer content on standard floppy disks
- Add images and multimedia to presentations, Web sites, e-mail

MVC-FD91

You don't have to spend thousands of dollars to get visual content for business or personal use. The MVC-FD81/91 Digital Mavica Cameras grab digital photos and video quickly. And these smart cameras store their content on standard floppies that you can use transfer to your Mac or PC. The FD81 offers a 3X zoom lens. The FD91 really gets in there at 14X. You also get professional features like 3-mode auto exposure, manual exposure, flash and self-timer. These cameras use a 1/3" progressive CCD to capture 850K pixel images. And you can record up to 15 seconds of presentation-quality MPEG video or 60 seconds for a video e-mail. So why not add some multimedia to your business and your life? Pick up a MVC-FD81/91 Digital Mavica Camera today.

**Kit includes: soft carrying case, InfoLithuim rechangeable battery, 3 floppydisks and a cleaning cloth.*

MVC-FD 81 $799.95 **MVC-FD 91 $999.95**

Olympus D-600L & D-620L Digital Cameras

- Best Digital Camera - *Macworld*, Jan. 1998 (D-600L)

D-600L

These SLR-style cameras let you capture high-quality digital images with 3X zoom, all-glass aspherical f2.8 autofocus lenses. The award-winning D-600L delivers 1280 x 1024 max resolution (1.4 Megapixels) and 4MB removable storage. The brand-new D-620L, for advanced shutterbugs, adds six-step manual white balance color and a burst mode for up to 5 shots in 1/3 second intervals. Jump into digital photography with Olympus today.

D-600L $879.95 **D-620L $1,149.95**

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- *Monitors and 3rd party products carry warranties from their respective manufacturers.*
- *SCSI cables sold separately.*
- *APS' warranty is a pass-through of the mechanism manufacturer's warranty which will be serviced by APS for one year. APS warrants APS branded enclosures, brackets and power supplies for a period of one year from the date of purchase and will, at its discretion, replace or repair products found to be defective according to the specific terms of the warranty accompanying the product.*
- *Refused orders subject to 20% restocking fee.*
- *International customers must pay for all shipping charges.*
- *Listed capacities are formatted.*
- *Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.*
- *Prices and specifications are subject to change without notice.*
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level tools for content creators

LaCie Electron21/108

- New 21" Diamontron Aperture Grille tube with 19.7" viewing area
- Max resolution of 1600 x 1200 pixels at 85Hz, 0.28mm dot pitch
- Ultimate monitor for image-critical creative professionals

Only demanding graphics, prepress, CAD and multimedia professionals can truly appreciate the Electron21/108. Superior image clarity and detail, excellent refresh rates and absolute on-screen control. The unique Blue Hood and frame eliminate glare and allow truer color perception. This monitor is a must-have when visual perfection is required.

As low as $1,399.95

LaCie Electron19 Blue

- Same advanced technology as the Electron21/108 in a 19" display
- 1600 x 1200 pixels at 75Hz with variable 0.25/0.27mm dot pitch
- Top performance for designers, producers and creators on a budget

If you want the best performance at the best price, the Electron19 Blue is a fantastic value. The Blue Hood cuts glare for best viewing. Top technology doesn't have to cost top dollar.

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Canon XL1 Digital Video Camcorder

- Broadcast-quality digital video for news, training videos, instant commercials
- 3-CCD system for highly-accurate color reproduction, wide dynamic range
- Over 500 lines of horizontal resolution for 25% better picture quality than analog

The broadcast-quality output and unparalleled flexibility of the Canon XL1 may redefine the world of video. In addition to amazing picture clarity and color, the XL1 automatically handles both extremely bright and low light conditions. Enjoy a potential focal range of between 24 and 2160mm through the use of XL and EF (camera) lenses via the optional EF Adapter XL. An optical 16X Zoom (32X Digital), three shooting modes, four-channel digital audio, optional 3X Super Wide-Angle Zoom, superior still images... whew! If video production is your bread and butter, get a better knife. Get the XL1 from Canon.

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- Use Nikon, Canon FD, Zeiss/Hasselblad, other lenses with optional adapters

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#19056	233MHz	32MB	2GB	512K	14.1" TFT	20X	Yes	56K	$2499	$88/mo
#19057	266MHz	64MB	4GB	1MB	14.1" TFT	20X	Yes	56K	$2999	$106/mo
#07968	300MHz	64MB	8GB	1MB	14.1" TFT	20X	Yes	56K	$3999	$141/mo
#19058	300MHz	64MB	8GB	1MB	14.1" TFT	DVD	Yes	56K	$4399	$155/mo

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128MB upgrade	#05061	CALL!

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102808	Olympus D-500L Digital Camera w/ FREE SNAPZ SmartMedia 8MB Memory	$699.98
102810	Olympus D-320L Digital Camera w/ FREE SNAPZ SmartMedia 8MB Memory	$399.98
102809	Olympus D-340L Digital Camera w/ FREE SNAPZ SmartMedia 8MB Memory	$499.98
102811	Olympus D-400L Zoom Digital Camera w/ FREE SNAPZ SmartMedia 8MB Memory	$799.98
03588	Epson PhotoPC 700 Digital Camera	$599.98
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95396	La Cie 4x8 External SCSI CD-Recorder	$349.98
60513	La Cie 4x6x2 External SCSI CDRW w/Toast	$529.98
95249	La Cie 36x SCSI External CD-Rom Drive	$159.98
37174	SparQ 1GB Ext USB Drive	$249.98
91952	Fuji CD-R 74min Single	$1.98
47562	Fuji CD-R 5 pack with $10 rebate	$14.98
59776	Fuji CD-R 10 pack with $20 rebate	$29.98
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55181	Zip External SCSI Reconditioned	$89.95
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52581	ZipPlus External SCSI & Parallel	$169.95
32251	Zip large carrying case	$29.95
83475	Zip PowerBook SCSI adapter	$19.95
12236	Iomega Zip 100MB Mac Media Gray 3pk	$49.95
12237	Iomega Zip 100MB Mac Media Gray 6pk	$79.95
12238	Iomega Zip 100MB Mac Media Gray 10pk	$99.95
73831	Iomega Zip 100MB Mac Media Color 10pk	$99.95
88195	Fuji Zip Color 5pk with $10 rebate and case	$59.98
37185	Fuji Zip Color 10pk with $10 rebate	$99.98
88194	Fuji Zip Gray 5pk with $10 rebate and Free Case	$59.98
37186	Fuji Zip Gray 10pk with $10 Rebate	$99.98
54009	Fuji Zip Gray 20pk w/ 4 Free Disks by mail	$198.98
86334	Fuji Zip Media 100MB Mac Disk	$14.98

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73839	Jaz 1GB SCSI Ext Drive Reconditioned	$199.9
95233	Jaz 2GB SCSI Int Drive	$349.9
95234	Jaz 2GB SCSI Ext Drive	$349.9
82841	Jaz large carrying case	$29.9
43360	Jaz Card PCMCIA Fax SCSI 2	$124.9
81235	Jaz 1GB Cartridge	$99.9
75663	Jaz 1GB Cartridge 3-Pack	$269.8
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76501	ViewSonic E771 17" Monitor	$329.98
93755	Princeton 90 Ultra 19"/18" Monitor	$479.98
03581	ViewSonic PS790 19"/18 .25" SM 1600	$599.98
46790	Sony Multiscan 200GS 17" Monitors	$489.98
77049	AppleVision 720 17" Display	$499.98
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46794	Sony Multiscan 500PS 21" Monitors	$1199.00
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80668	Epson Stylus 800	$249.98
00575	Epson Stylus Photo 700	$249.98
00583	Epson Stylus EX	$499.98
40920	Epson Stylus 1520	$499.98
76985	Epson Color 3000	$1299.00
57715	HP Deskjet 1120se Printer	$598.98
82666	HP Laserjet 6MP Printer	$898.98
53213	HP LaserJet 4000N Printer	$1449.00
57728	HP LaserJet 5000N Printer	$2059.00
57736	HP LaserJet 8000N Printer	$2539.00
85467	HP LaserJet 5M Color Printer	$4998.00
76646	Tektronix Phaser 740 Color Laser	$1995.00
76087	Tektronix Phaser 740 Plus Color Laser	$2695.00
74757	Apple LaserWriter 8500	$1799.00
52851	Costar Labelwriter Turbo	$249.98

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54832	Umax Astra 1200s w/Photoshop LE	$149.98
72396	Microtek ScanMaker V600 f/Mac	$119.98
17950	Umax Astra 1200 w/Photo Dlx/PageManager	$149.98
40937	Umax Astra600/1200 Transparency Adapter	$189.98
56912	Linotype Jade2 Full Photoshop 4.0	$499.98
53990	Microtek Scanmaker V310 Flatbed Scanner	$79.98
00540	Umax Astra 1220S/P Transparency Adapter	$199.98
58434	Umax Powerlook II w/PhotoshopLE	$795.98
58476	Linocolor Saphir w/TMA/VisuaLab	$1099.00
02135	AGFA Arcus II Scanner w/Photo Shop 4.0	$1099.00

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03516	NuPowr G3 240MHz f/PowerBook 2400	$849.9
	PowerMac Upgrades	
60439	MAXpowr G3 220MHz/110	$449.9
60408	MaxPwr G3 250MHz	$529.9
94400	MAXpowr G3 333/166	$1229.0
94403	MAXpowr G3 366/183	$1499.0
	PowerMac G3 Upgrades	
94405	MAXpowr G3 333/166	$1229.0
94406	MAXpowr G3 366/183	$1499.0
94409	MAXpowr G3 400/200	$1999.0
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03526	Crescendo G3 300MHz	$799.9
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G3/300 DT	G3/300MHz	6.0GB	64MB	24X	2MB	512K	10Base-T	Yes	#19051	$1999	$71/mo.
G3/300 MT	G3/300MHz	8.0GB	64MB	24X	6MB	1MB	10Base-T	Yes	#19054	$2399	$85/mo.
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0339	Teleport 56k v.90 ext Fax/Modem for Mac	$129.98
0313	3Com/USR 56k v.90 D/F for Mac	$97.98*
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5229	Viking 56k v.90 external fax/modem	$99.98
4690	Global Village 56k v.90 PC Card	$169.98

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03727	Kensington Keyboard in a Box	$49.98
89379	Kensington Mouse 1.0	$59.98
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78420	Kensington Orbit	$69.98
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7930	APC Back-UPS 500	$149.98
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7923	APC Back-UPS Pro 280	$149.98
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7926	APC Back-UPS Pro 650	$269.98
3537	APC Back-UPS Pro 1000	$389.98
3827	APC Back-UPS Pro 1400	$459.98
5740	APC Smart-UPS 420	$269.98
5741	APC Smart-UPS 620	$339.98
7165	APC Smart-UPS 700	$368.98
0410	APC Smart-UPS 1000	$519.98
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70490	AsanteFAST 10/100 PCI	$44.98
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91817	Asante 8 Port 10T Hub (AUI/BNC)	$99.98
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91818	Asante 12 Port 10T Hub (AUI/BNC)	$149.98
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50728	Asante Mini AUI to 10FL Transceiver	$189.98
50515	IntraSwitch 5324 24 Port 10T (1 10/100)	$1139.00
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93331	Micro AsantePrint 10T/TK/TN	$159.98
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3.2GB Stratus SE	QM33240SES	10ms	5400	$239	$309
6.4GB Stratus SE	QM36480SES	10ms	5400	$359	$429
8.4GB Stratus SE	QM38420SES	10ms	5400	$479	$549
9.1GB Atlas III	QM309100TDS	7.8ms	7200	$539	$609
18.2GB Atlas III	QM318200TDS	7.8ms	7200	$989	$1059
UltraWide SCSI-3					
4.5GB Viking II	QM304550PXSW	7.5ms	7200	$299	$389
9.1GB Viking II	QM309100PXSW	7.5ms	7200	$479	$569
9.1GB Atlas III	QM309100TDLW	7.8ms	7200	$539	$639
18.2GB Atlas III	QM318200TDLW	7.8ms	7200	$989	$1089
IDE Drives					
3.2GB Fireball EX	QM303200EXA	9.5ms	5400	$139	----
5.1GB Fireball EL	QM305100ELA	10ms	5400	$159	----
6.4GB Fireball EX	QM306400EXA	9.5ms	5400	$179	----
10.2GB Fireball EL	QM310200ELA	9.5ms	5400	$259	----
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4.5GB Medalist Pro	ST39140N	9.5ms	7200	$469	$539
9.1GB Barracuda 9LP	ST39173N	7.1ms	7200	$899	$969
18.2GB Barracuda 18	ST118273N	7.1ms	7200	$1029	$1099
UltraWide SCSI-3						
9.1GB Barracuda 9LP	ST39173W	7.1ms	7200	$529	$619
9.1GB Cheetah 9LP	ST39102LW	12.2ms	10000	$729	$829
18.2GB Barracuda 18	ST118273W	7.1ms	7200	$899	$989
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ClubMac drives are preformatted and thoroughly tested. ClubMac external drives include a 30-Day Money Back Guarantee, Charismac Anubis Formatting Utility software, user's guide, 25/50-pin SCSI cable and power cord (wide drives include 68/68 pin SCSI cable). Bare drives include mounting screws only.

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Format	**Part#**	**Size**	**Qty 1-2**	**Qty 3-5**	**Qty 6+**
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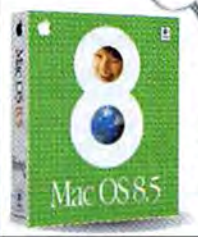

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4310MB	5400rpm	512K	FB34300S	3yr	$269	$329
6448MB	5400rpm	512K	FB36400S	3yr	$349	$409
8455MB	5400rpm	512K	FB38400S	3yr	$429	$489
9100MB	7200rpm	1024K	XP309100S	5yr	$460	$520
18200MB	7200rpm	1024K	XP318200S	5yr	$809	$869

ULTRA WIDE SCSI

4550MB	7200rpm	512K	VK304550W	5yr	$250	$340
9100MB	7200rpm	512K	VK309100W	5yr	$419	$509

ULTRA 2 SCSI

4550MB	7200rpm	512K	VK304550LW	5yr	$250	$350
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9100MB	7200rpm	1024K	XP309100LW	5yr	$460	$560
18200MB	7200rpm	1024K	XP318200LW	5yr	$809	$909

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35GB	70GB	$4675 DLT7000	$4895 DLT7000QX	n/a
100GB	200GB	n/a	$3879 DLT4500	$3769 DLT4500R
140GB	280GB	n/a	$5589 DLT4700	$5389 DLT4700R

Call for Differential SCSI models, and DLTstor products. Call for the best prices in the industry on DLT media.

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DLTIIIXT 15-30GB Media (DLT3XT)	$40.5	$40	$38	$36
DLTIV 20-40GB Media (DLT4)	$80	$79	$77	$75

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(DLTCLEAN)
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• CD RECORDERS •

Smart Storage Solutions CDR Drives Include:
- ✓ Toast Mastering Software
- ✓ 5 FREE disks
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4x8 CDR $259

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Includes Toast & DirectCD Software!
DirectCD from Adaptec now makes a CD Recorder as easy to use as a hard drive.

Compare our price and you will see we are the #1 source for CD Recorders!

	Internal	External
CD RECORDABLE Includes 5 Free Recordable Disks!		
4x8 Panasonic mechanism, tray load, 1MB buffer	**$259**	**$319**
4x12 Teac mechanism, tray load, 1MB buffer	$329	$389
4x12 Plextor mechanism, caddy/tray load, 2MB buffer	$389	$449
8x20 tray load, 2MB buffer	$509	$569

PRICE BREAKTHRU

Stomper CD label kit only $35 with CD-R drive!

CD REWRITABLE Includes 5 Free ReWritable Disks!		
4x4x16 Yamaha mechanism, tray load, 2MB buffer	$389	$449
Special external with only 1 CD-RW disk (SSS4X4X16M1)		**$429**
CD-RW starter pack 5 CD-RW disks & 10 CD-R disks (CDSTARTER)		**$50**

Fargo Signature CD Printer $999	CD Duplicators Call for price.	CD Stomper label kit $49	Toast retail package $89	100 CDR-74 w/drive $120	50 CD-RW w/ drive $289

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Jaz 2GB (DUO2GBJAZM) $359

• SCSI HARD DRIVES •

Seagate

					Internal	External
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4550MB	7200rpm	512K	ST34573N	5yr	$399	$459
6530MB	7200rpm	512K	ST36530N	3yr	$335	$395
9140MB	7200rpm	512K	ST39140N	3yr	$410	$470
9190MB	7200rpm	1024K	ST39173N	5yr	$460	$520
18200MB	7200rpm	1024K	ST118273N	5yr	$819	$879
ULTRA WIDE SCSI						
4520MB	7200rpm	512K	ST34520W	3yr	$232	$322
4550MB	7200rpm	512K	ST34573W	5yr	$399	$489
6530MB	7200rpm	512K	ST36530W	3yr	$335	$425
9140MB	7200rpm	512K	ST39140W	3yr	$410	$500
9190MB	7200rpm	1024K	ST39173W	5yr	$460	$550
18200MB	7200rpm	1024K	ST118273W	5yr	$819	$909
ULTRA 2 SCSI						
4550MB	7200rpm	1024K	ST34573LW	5yr	$399	$509
4550MB	10,000rpm	1024K	ST34502LW	5yr	$520	$630
9100MB	10,000rpm	1024K	ST39102LW	5yr	$690	$800
9100MB	10,000rpm	4096K	ST39102LW4	5yr	$779	$889
9190MB	10,000rpm	1024K	ST39173LW	5yr	$460	$570
18200MB	7200rpm	1024K	ST118273LW	5yr	$819	$929
18200MB	10,000rpm	1024K	ST118202LW	5yr	$1289	$1399
18200MB	10,000rpm	4096K	ST118202LW4	5yr	$1399	$1509

IBM

4550MB	5400rpm	512K	IBM34560N	5yr	$275	$335
9100MB	7200rpm	512K	IBM39130N	5yr	$485	$545
18200MB	7200rpm	1MB	IDGHS18Z	5yr	$849	$909
ULTRA WIDE SCSI						
4550MB	5400rpm	512K	IBM34560W	5yr	$275	$365
9100MB	7200rpm	512K	IBM39130W	5yr	$485	$575
9100MB	10020rpm	1MB	IDVGS9U	5yr	$579	$669
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With 3 9GB Seagate Cheetah Ultra-2 $2399

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24X - 6 disc changer	Pioneer	DRM6324XM		$419
32X - Tray load	Toshiba	XM6201BM/XM	$105	$165
32X - 512K buffer	Plextor	PX32TSM/XM	$145	$205
36X - Slot load	Pioneer	DRU706M/XM	$90	$150

• MISCELLANEOUS •

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JAZ Media Sale 1GB qty 2-9 / 10+		$79 / $77
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SYQUEST 1.5GB Ask about rebate	SYJET1.5MAC	$275
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PCI Ultra 2	A2940MU2W	$399
ATTO Controllers		
PCI Fibre Channel	ATTOPCIFC	$769
PCI Ultra 2 SCSI	ATTOPCIU2	$425
above w/ RAID software & cable	ATTOPCIU2K	$609
E4 Cool DVD Kit		
Complete kit for Mac G3 computers	DVDMAC	**$349**
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2.6GB T5-2600 $1149	5.2GB T6-5200	$1499
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5 Pack	$21/$19	$59/$55	$28/$25
20 Pack	$42/$39	$189/$185	$65/$62
50 Pack	$93/$89	$429/$419	$139/$135
100 Pack	$159/$149	$819/$809	$259/$249
Budget 5 Pack	$19/$17	$33/$33	$24/$21
Budget 20 Pack	$36/$33	$129/$125	$55/$52
Budget 50 Pack	$74/$70	$319/$309	$119/$109
Budget 100 Pack	$139/$120	$619/$609	$189/$179

CDR74 is recordable, CDR74W is rewritable, CDR74P is printable. $ is alone/with CDR purchase. 8X certified, & Platinum now available.

• IDE HARD DRIVES •

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4311MB	WD	5400rpm	AC24300	3yr	$144
6448MB	WD	5400rpm	AC36400	3yr	$167
7696MB	Quantum	5400rpm	FB307600A	3yr	$185
8606MB	Seagate	5400rpm	ST38641A	3yr	$187
10100MB	IBM	7200rpm	IBM10GXP	3yr	$266
10200MB	Seagate	5400rpm	ST310240A	3yr	$222
12750MB	Quantum	5400rpm	FB312700A	3yr	$270
13020MB	WD	5400rpm	WDAC31300	3yr	$279
14400MB	IBM	7200rpm	IBM14GXP	3yr	$374
16800MB	IBM	5400rpm	IBM16GP	3yr	$379
17280MB	Maxtor	5400rpm	M91728D	3yr	$350

2.5" IDE for laptops - Call for the best price around

RAID

These preconfigured RAIDs can be run in RAID 0 or 1 mode. The capacity listed is for RAID 0 configuration. In RAID 0, the data is striped across a pair of drives. This is perfect for digital video such as Media 100, TrueVision, Avid, or other applications that require extremely high data transfer rates.

Includes - Ultra 2 LVD SCSI drives - Adaptec PCI Ultra-2 SCSI controller - Adaptec Remus Lite RAID software - Necessary cables

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18GB	7,200rpm	2	9.1GB Quantum Viking drives	$1659	$1559
18GB	7,200rpm	2	9.1GB Quantum Atlas drives	$1859	$1659
18GB	7,200rpm	2	9.1GB Seagate Barracuda drives	$1829	$1629
18GB	10,000rpm	2	9.1GB Seagate Cheetah drives	$2289	$2089
36GB	7,200rpm	2	18GB Quantum Atlas drives	$2599	$2399
36GB	7,200rpm	2	18GB Seagate Barracuda drives	$2629	$2429
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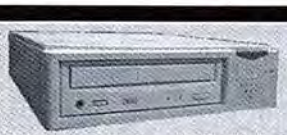

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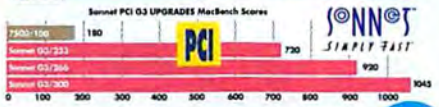

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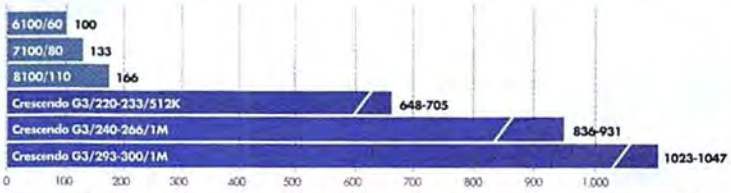

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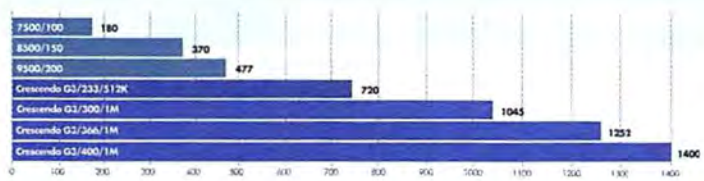

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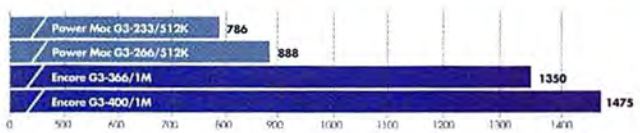

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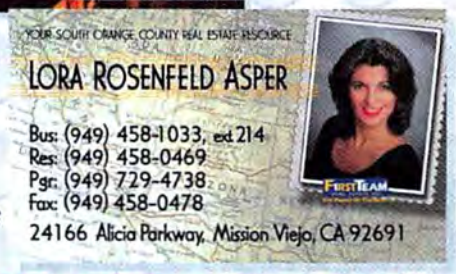

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Name Your Game

From Goofy to Gory, Macworld Reviews 48 Ways to Play

TIM LEE

Compiled by Michael Gowan

LOOKING FOR SOME ACTION? WHETHER you're after adrenaline-soaked intensity or a mind-bending puzzler, this comprehensive collection of rated reviews has you covered.

3-D ULTRA PINBALL COLLECTOR'S EDITION

♦♦ There are some wonderful pinball games for the Mac—unfortunately, none of them are in this collection. The tables are too short, the ball movement is unrealistic, and game play suffers from the stutters. For superior pinball action, you're better off checking out Empire Interactive's Pro Pinball: The Web and Pro Pinball: Timeshock instead. **COMPANY:** Sierra On-Line (425/746-5771, www.sierra.com). **PRICE:** $39.95.

A-10 CUBA

♦♦♦♦ Featuring the best flight modeling of any Mac flight sim, A-10 Cuba asks you to pilot your "hawg" around the Caribbean, doing battle with a cigar-champing enemy. Lacking F/A-18 Korea's beauty and mission-creation capabilities, A-10 Cuba still offers great game play, varied missions, and rough-and-tumble network play. **COMPANY:** Parsoft Interactive (972/379-4462, www.parsoft.com). **PRICE:** $29.95.

ASTROROCK 2000

♦♦½ Pilot Ned Zeffer through space to save Earth and, more important, rock and roll! If you like to shoot stuff until your fingers bleed, Astrorock 2000 gives you more than enough weapons and power-ups to get the job done. Think of it as Asteroids with attitude. Unfortunately, as with the arcade classic, Astrorock 2000's game play is way past its time. **COMPANY:** Logicware (626/938-9108, www.logicware.com). **PRICE:** $19.95.

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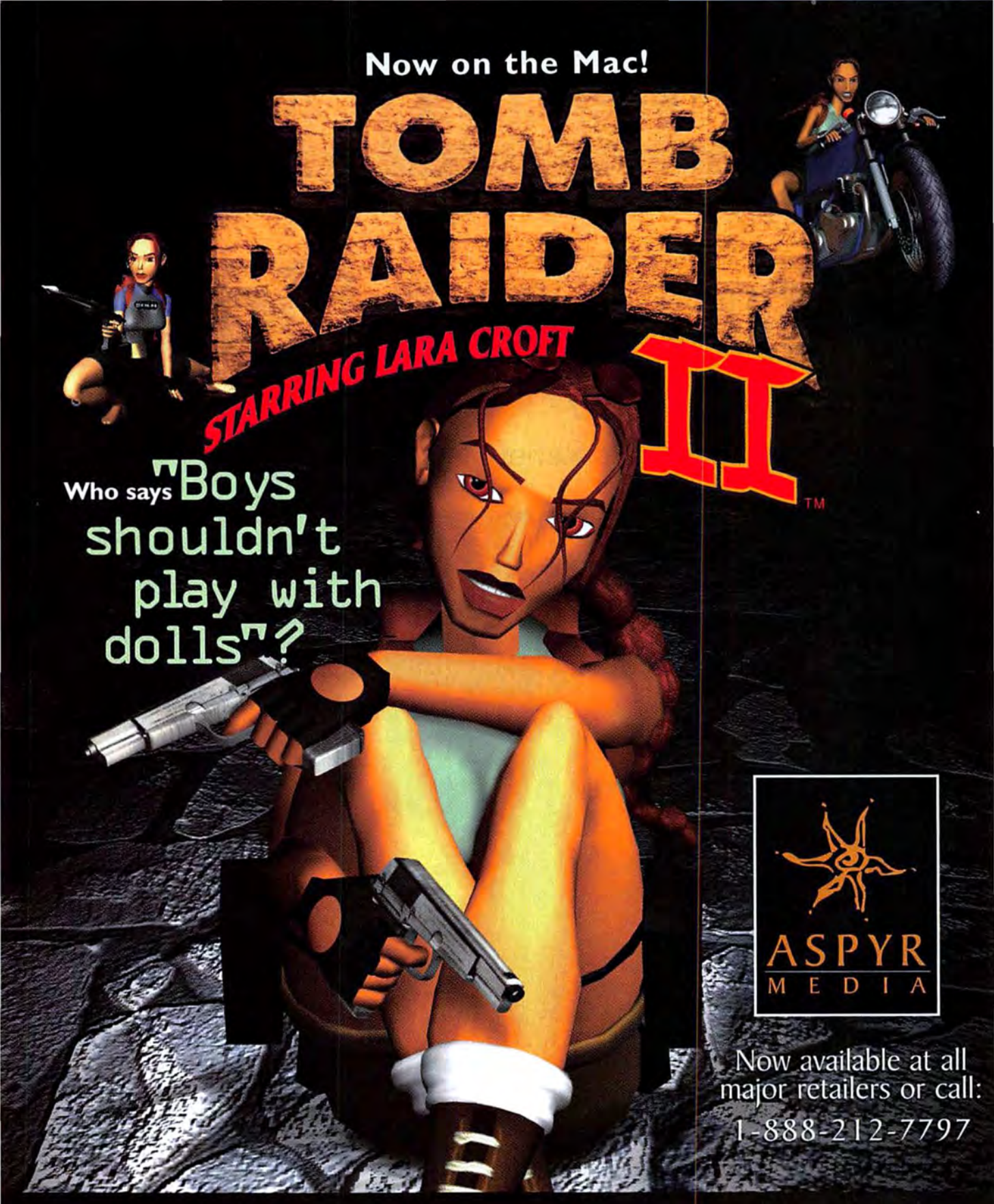

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BATTLE-GIRL

♦♦♦½ As Battle-Girl, you must stop the robot Terminus from destroying the Great Machine, with as much sass as you can muster. It's a kick to move your little craft around this 2-D, overhead environment and blast the heck out of your stick-figure enemies. Frantic action, 99 levels, and a throbbing soundtrack make for an arcade-y good time. **COMPANY:** Power Media (503/684-8232, www.powermedia.com). **PRICE:** $39.95.

Battle-Girl

CARMAGEDDON

♦♦♦½ Speed through the course or just ram your competitors out of the contest in this bloody car race. Great graphics are offset by view angles that make it difficult to see where you're headed. Road-rage sufferers may enjoy turning cows and pedestrians into roadkill. **COMPANY:** Aspyr Media (512/708-8100, www.aspyr.com). **PRICE:** $29.95.

CASINO: PLAY TO WIN

♦♦♦½ Whether you need to brush up on your gambling skills or you want to quell your gambling desires without risking your shirt, Casino: Play to Win will let you play blackjack, craps, keno, video poker, roulette, and slots to your heart's content. The ambient casino noise and realistic game play will remind you of an actual casino—minus the cigarette smoke, of course. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $19.99.

CIVILIZATION II

♦♦♦♦ Build a civilization from scratch while working toward world domination. Hardcore strategists will enjoy this game's complexity. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $49.99.

CLOSE COMBAT—A BRIDGE TOO FAR

♦♦♦½ Command troops in the landmark World War II battle Operation Market Garden. This real-time strategy war game boils down the complexity of battle into a fairly intuitive interface; it's a solid campaign game where reinforcements, supplies, and morale play a big part in achieving victory or defeat. **COMPANY:** Microsoft (425/637-9308, www.microsoft.com/games). **PRICE:** $54.95.

DEADLOCK

♦♦♦ Fend off rival species in a race to colonize Gallius V. This strategic sim's clear and informative interface makes building your colony easy and fun, but it may not be challenging enough for serious fans. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $29.99.

DEER HUNTER

♦♦ Search for evidence of deer traffic, then hunker down and wait . . . and wait. Eventually a deer will wander by so you can blast it into virtual venison. Limited options and slow play kill this hunt before it begins. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $19.99.

DIABLO

♦♦♦♦½ Explore dungeons and slay monsters in a lavishly detailed environment. The only downside to this role-playing game is that the adventure ends too soon. **COMPANY:** Blizzard Entertainment (949/955-1380, www.blizzard.com). **PRICE:** $40.

DUKE NUKEM 3D: ATOMIC EDITION

♦♦♦♦ Take on hordes of invading aliens with an impressive array of weapons. Full of violence and sexual content, this first-person shooter offers a comic tone and addictive action that balance out its vulgarity. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $29.99.

ESCAPE VELOCITY: OVERRIDE

♦♦♦♦½ Explore the galaxy, earn cash, improve your social standing, or chuck it all and become an evil space pirate. Fulfill your Han Solo fantasies in this sci-fi adventure. **COMPANY:** Ambrosia Software (716/325-1910, www.ambrosiasw.com). **PRICE:** $25.

F/A-18 KOREA

♦♦♦♦½ Analyze the assault of information your jet provides, but be sure to keep an eye to the skies for the enemy. Spectacular graphics and stunningly realistic flying make this the ace of Mac flying sims. **COMPANY:** Graphic Simulations (972/386-7575, www.graphsim.com). **PRICE:** $29.95.

FLYING CIRCUS

♦♦♦½ This Mac-native flight sim offers a fair range of options to fans willing to brave deadly dogfights over the skies of World War I. It takes advantage of QuickDraw 3D RAVE acceleration and even supports 3Dfx acceleration. Custom missions and network support round out this solid game. **COMPANY:** Bullseye Software (702/831-2523, www.dogfightcity.com/mac). **PRICE:** $65.

HEADRUSH

♦♦♦♦ The latest mind-bender from the maker of You Don't Know Jack, HeadRush aims at a younger crowd. Test your knowledge of science, history, and useless pop-culture trivia, and get toasted when you're wrong. **COMPANY:** Berkeley Systems (510/540-5535, www.berkeleysystems.com). **PRICE:** $29.95.

IMPERIALISM

♦♦♦½ Use limited resources and diplomacy to build an industry during the imperialist drive of the nineteenth century. While it lacks tactical realism, this sim provides strategy buffs some compelling management challenges. **COMPANY:** Mindscape (617/761-3000, www.mindscape.com). **PRICE:** $19.95.

JACK NICKLAUS 4

♦♦♦♦ Featuring five courses, network play, a convincing physics model, and the ability to create your own courses from scratch, this golf simulation has only one bogey: the delay between swinging the club and the corresponding animation. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $29.99.

F/A-18 Korea

LINKS LS

♦♦♦♦½ Tee up even when your favorite course is buried under snow. Featuring a library of actual courses from around the world, this beautifully rendered golf sim is almost as tough to master as the real thing. **COMPANY:** Access Software (801/736-7000, www.accesssoftware.com). **PRICE:** $44.95.

LODE RUNNER 2

♦♦♦ The latest iteration of Lode Runner—the classic run, gather-the-gold, and then hightail-it-to-the-next-level arcade game—lacks the original game's most attractive feature: simplicity. The 3-D perspective requires that you move diagonally rather

than left and right, which can be confounding. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $29.99.

MARATHON TRILOGY BOX SET

♦♦♦♦ As a lone security officer, you battle alien starships, explore lost civilizations, and triumph against the odds. This first-person shooter proves that even a computer game can stand the test of time. In its scope alone, this collection of adventures staggers the imagination. **COMPANY:** Bungie Software (312/397-0500, www.bungie.com). **PRICE:** $39.95.

MARS RISING

♦♦♦♦ Martian rebels have destroyed the Terran military forces on Mars. It's up to you to counterattack in your Vac-Fighter, killing Martian forces on the ground and in the air. This challenging sci-fi shoot-'em-up features constantly moving landscapes and nonstop action. **COMPANY:** Ambrosia Software (www.ambrosiasw.com, 716/325-1910). **PRICE:** $20.

MASTER OF ORION II: BATTLE AT ANTARES

♦♦♦♦ Compete against as many as seven computer or human players for control of the universe in this sci-fi adventure. Design a new race of beings and exploit its abilities to vanquish your enemies. The countless strategy options will keep you coming back for more. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $29.99.

MONOPOLY

♦♦♦½ The classic Parker Brothers board game comes to the Mac and is just as enjoyable as the original. Game play is enhanced by amusing 3-D animations and the ability to play against customized computer opponents as well as with people over the Internet. What's great about Monopoly is its simplicity—a more-than-welcome breather from a sea of uninspiring games trying to do too much. **COMPANY:** Hasbro Interactive (800/400-1352, www.hasbrointeractive.com). **PRICE:** $29.99.

MYTH: THE FALLEN LORDS

♦♦♦♦ Command troops against the evil Fallen Lords and the undead in this real-time battle game. Strategic challenges and amazing 3-D landscapes make this a war worth waging. **COMPANY:** Bungie Software (312/397-0500, www.bungie.com). **PRICE:** $39.95.

PAX IMPERIA: EMINENT DOMAIN

♦♦ Raise your species to be the dominant power in the galaxy by exterminating all competitors. This space-age strategy game tries to turn a slow-moving genre into a real-time experience, but lackluster graphics and long waits cause it to fall flat. **COMPANY:** THQ (818/225-5167, www.paximperia.com). **PRICE:** $49.95.

REAL POOL

♦♦♦♦ An incredibly realistic physics model makes this a pool game worth playing. Mouse control of the cue works remarkably well, and the table and balls are fairly attractive. A better table overview would be nice, but that aside, this is a game Minnesota Fats would be proud of. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $19.99.

REDJACK: REVENGE OF THE BRETHREN

♦♦♦♦ This enjoyable pirate adventure demands that you, in the guise of Nick Dove, solve puzzles, gather goodies, and cross swords with your enemies. The game features a good story line, slightly rough language, and arcadelike swordplay that's a bit too hard to master. **COMPANY:** Cyberflix/THQ (818/225-5167, www.thq.com). **PRICE:** $39.95.

RIVEN

♦♦♦♦½ Vivid details and an engaging story make this Myst sequel more like a good novel than a computer game. Explore its rich, engrossingly mysterious world in search of clues that can explain how you arrived there and what you need to do in order to escape. **COMPANY:** Red Orb Entertainment (423/670-2032, www.riven.com). **PRICE:** $39.95.

ROCKY MOUNTAIN TROPHY HUNTER

♦♦ Like the inexplicable PC hit Deer Hunter, Rocky Mountain Trophy Hunter is a soporific exercise in aimless wandering and waiting. Let's face it: scouting for bear droppings and making ridiculous animal noises just isn't much fun. Aside from its soothing nature sounds, there's no reason to hunt for this game. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $19.99.

RedJack

SCRABBLE

♦♦♦½ The board is virtual but the game remains the same. Test your vocabulary skills against the computer or a friend. Thanks to the Internet, your opponent can live on the other side of the world. **COMPANY:** Hasbro Interactive (800/400-1352, www.hasbrointeractive.com). **PRICE:** $29.95.

SHATTERED STEEL

♦♦♦ Fans of Mech games will enjoy Shattered Steel. Players control a giant armored robot suit and battle for supremacy in the galaxy. It's definitely an action game, the visuals are solid (although a few years old at this point), and the play is engaging. The scope of the game's missions could be more varied, however. **COMPANY:** Logicware (626/938-9108, www.logicware.com). **PRICE:** $29.95.

Riven

THE SPACE BAR

♦♦♦½ The premise of this point-and-click adventure game is actually fairly unique: players chat with characters in the game and psychically relive memories in order to solve a mystery. The writing is generally amusing and the visuals quite nice. If you liked the bar in *Star Wars*, Space Bar is good for a diversion. **COMPANY:** SegaSoft (888/734-2763, www.segasoft.com). **PRICE:** $29.99.

STAR CONTROL 3

♦♦ The universe faces destruction from tears in the space-time continuum. You can save the universe by repairing the tears, but it's probably not worth the trouble. This science-fiction adventure lacks a modern game feel, with stale character interaction and clumsy fighting modes. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $19.99.

STAR TREK: CAPTAIN'S CHAIR

♦♦♦ *Star Trek* fans should enjoy this CD-ROM, but it lacks depth for anyone else on this planet. Simply a virtual-reality tour of five starship bridges, Captain's Chair allows you to move from place to place and poke control panels with almost as much aplomb as Lieutenant Sulu, and it contains a few hidden

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treats—such as 3-D models of the starship exteriors. **COMPANY:** Simon & Schuster Interactive (888/793-9972, www.ssinteractive.com). **PRICE:** $29.99.

STAR TREK: STARSHIP CREATOR

♦♦♦ Control the construction of your own starship, from choosing its class to picking its crew. Once you're ready to go where no one has gone before, see if your newly christened ship has what it takes to successfully complete several automated missions. Unfortunately, you become a mere spectator once your creation heads out into the unknown. **COMPANY:** Simon & Schuster Interactive (888/793-9972, www.ssinteractive.com). **PRICE:** $29.99.

TEMPEST 2000

♦♦♦ Go back to the future with this update of the classic arcade game, shooting wave after wave of rapidly approaching aliens. The update adds the ability to jump over oncoming enemies and enhances the graphics, but it's still a repetitive eighties arcade game at heart. **COMPANY:** Logicware (626/938-9108, www.logicware.com). **PRICE:** $19.95.

TIE FIGHTER

♦♦♦♦½ Embody the Empire's dark forces and take on the Rebel Alliance. The action of a World War II dogfight is combined with the fantasy of *Star Wars* in this great game. **COMPANY:** LucasArts Entertainment (888/532-4263, www.lucasarts.com). **PRICE:** $29.95.

TOMB RAIDER II

♦♦♦♦ Guide video-game superstar Lara Croft through an Indiana Jones–esque three-dimensional world of temples and caverns in search of priceless artifacts. While gunplay is involved, it's exploration and problem solving that keep you riveted for hours. The impressive graphics are even better with a 3-D accelerator installed. **COMPANY:** Aspyr Media (512/708-8100, www.aspyr.com). **PRICE:** $49.95.

UNREAL

♦♦♦♦½ This 3-D shoot-'em-up reinvigorates a tired genre. Plot, atmosphere, and exploration mix with ferocious enemies to make this game stand out from the pack. Note: 3-D–acceleration hardware is a must. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $49.99.

WARCRAFT II—TIDES OF DARKNESS

♦♦♦♦ As Blizzard's flagship title, Warcraft II embodies the best of real-time strategy as players juggle moving units, mining resources, and building fortifications. This game set the standard for the genre and still represents one of the best titles available. If you haven't played it, you have missed something. **COMPANY:** Blizzard Entertainment (949/955-1380, www.blizzard.com). **PRICE:** $30.

THE X-FILES GAME

♦♦♦ As FBI agent Craig Willmore, you work alongside Mulder, Scully, and the rest of the cast of the *X-Files* TV show in this adventure game. Its excellent use of QuickTime video is offset by tediously slow sections. **COMPANY:** Fox Interactive (310/369-7000, www.foxinteractive.com). **PRICE:** $54.98.

YOU DON'T KNOW JACK: HUGE

♦♦♦♦½ This one will strain your brain while amusing you with its witty banter and rapid-fire action. It includes 2,400 questions from the original Jack volumes 1 through 3. **COMPANY:** Berkeley Systems (510/540-5535, www.berkeleysystems.com). **PRICE:** $39.95. m

HOT OFF THE PRESS

Five New Games We Can't Wait to Play

MYTH II: SOULBLIGHTER

In this sequel to the popular strategy game Myth: The Fallen Lords, you return to the land of Myth, where a new enemy threatens the realm. You manage troops in real-time battles against the undead. Topped with the addition of cross-platform, multiplayer gaming via the Internet, this is one of the year's most eagerly awaited releases. **COMPANY:** Bungie Software (312/397-0500, www.bungie.com). **PRICE:** $49.95.

FUTURECOP: L.A.P.D.

It's the twenty-first century. Gangs control large areas of Los Angeles. As a cop, your mission is to put the gangs out of commission and make the streets safe. Armed with a hovercraft that transforms into a mechanical walker, you must infiltrate the gangs and eliminate their leaders. This third-person shooter features variable views and a fully 3-D environment. **COMPANY:** Electronic Arts (650/628-1500, www.ea.com). **PRICE:** $19.95.

DARK VENGEANCE

The world has been thrown into darkness, and you must bring it back to light. This adventure features three combat styles—hand-to-hand combat, long-range spell casting, and trickery—and three different characters. In addition to 17 levels of single-player gaming, you can engage in multiplayer action. **COMPANY:** MacSoft (612/509-7600, www.wizworks.com/macsoft). **PRICE:** $49.99.

STARCRAFT

What gamer doesn't dream about ruling supreme over the galaxy? Starcraft, the successor to Warcraft, extends that game's strategic battles to the stars. You aim to conquer the universe, battling in space and on planets as one of three species, each of which requires different strategies for victory. As the game evolves, so does the story line. The game includes a scenario and map editor that lets you create a custom adventure. **COMPANY:** Blizzard Entertainment (949/955-1380, www.blizzard.com). **PRICE:** $50.

Myth II

REDNECK RAMPAGE

This first-person shooter wins the strangest-premise award: aliens come to Earth and steal a pig from some backwoods rednecks. You, as a backwoods redneck, must get the pig back. Power up with pork rinds, whiskey, and beer, and then grab your shotgun and hit the trail. The soundtrack includes songs by Mojo Nixon and the Reverend Horton Heat. **COMPANY:** Logicware (626/938-9108, www.logicware.com). **PRICE:** $39.95.

F/A-18

KOREA

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The Game Room

by Philip Dyer

The Best Is Yet to Come

MORE GAMES ARE ARRIVING ON THE MAC EVERY DAY. HERE'S A SNEAK PEEK.

SO FAR, IT SEEMS THAT Apple's recommitment to gaming has been little more than assault by alphabet soup: iMac, USB, OpenGL, 3-D, and even ATI. In the end, only one thing matters: what new games are coming out for the Mac? To find out, I asked a few game developers about their plans for 1999. All indications are that the coming year is going to be—to quote my little brother—"hella cool." Here's what you can expect.

Volume, Volume, Volume

No, I don't mean that the games are going to be louder. Rather, there will be more of them—a lot more. Game developers are flocking to the Mac market to meet the demand of the burgeoning throngs of Mac users—particularly iMac users. In fact, the only developer that isn't planning more new Mac titles than ever is MacPlay, and that's because InterPlay, in a classic example of bad timing, disbanded its MacPlay division last year. That aside, everyone else has a full plate of Mac games in production for this year, so start saving your lunch money.

For what, you ask? Well, you didn't hear it from me, but Blizzard's Diablo II should be available for our fine platform in the not-too-distant future. Also look for a StarCraft expansion pack from Blizzard Entertainment, in addition to another WarCraft scenario pack, WarCraft Platinum. Additionally, rumor has it that MacSoft will take advantage of the Unreal engine to crank out some great-looking titles this year, including Klingon Honor Guard and—I hope, I hope—Duke Nukem Forever. Fans of Maxis Software's Sim series will also have reason to rejoice this year when the Mac version of SimCity 3000 arrives on the scene. And Bungie Software will be releasing a hot action title called Oni, featuring a one-woman SWAT team who's as deadly with a spin kick as she is with a gun.

Why Wait?

At this writing, two notable games were scheduled for simultaneous PC and Mac releases: MacSoft's Total Annihilation and Electronic Arts' FutureCop: LAPD. Many more same-day releases are slated for this year, but one company is taking it a step further: Sega is planning a Mac-first release of Yoot's Tower (an unofficial sequel to SimTower).

Play Ball!

Brace yourselves, sports fans—a new day is dawning for Mac sports games. As I mentioned, Electronic Arts is finally coming back to the Mac with FutureCop. Since EA also publishes some of the best sports games on the PC, you don't have to be Kreskin to predict that if FutureCop does well, the other EA divisions (including EASports) will also pounce on the Mac market. Sierra is also retesting the Mac waters right now with its Hoyle series of casino, board, and card games, and—if things go well—could bring its sports titles over, too. In addition, Acclaim had already done a lot of work on the Mac version of NBA Jam before the project was shelved. It shouldn't take too many success stories to convince the company to finish what it started.

3-D Mania

It's been an uphill climb, but 3-D–accelerator cards for the Mac platform are finally becoming affordable. Expect Voodoo cards to dip below $100, and Voodoo II cards to drop significantly in price as well. In addition, Apple is now including the ATI Rage Pro chip set on all desktop and iMac models, so pretty much everyone can enjoy some level of hardware acceleration. Trust me, until you've seen the unbelievably smooth textures and cool halo explosions while you fly down a hallway at 60 frames per second, you haven't *really* played Quake.

These are just a few of the trends we'll start seeing over the next year. In addition to the big commercial developers, such prolific shareware producers as Ambrosia, Freeverse, Fantasoft, Delta Tao, and many others have full schedules for 1999 and beyond. So fasten your seat belts: this is going to be a helluva year! **m**

Several game developers have admitted to creating Mac versions of their games just so Senior Online Editor PHILIP DYER will stop bugging them.

OTTO STEININGER

February 1999, Volume 16, Number 2 Macworld (ISSN 0741-8647) is published monthly by Mac Publishing, L.L.C. Editorial and business offices: 301 Howard St., 16th Fl., San Francisco, CA 94105, 415/243-0505. Subscription orders and inquiries should be directed to 303/665-8930. Subscription rates are $34.97 for 12 issues, $59.97 for 24 issues, and $79.97 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add $20 per year for postage for Canada, Mexico, and all surface mail to foreign countries. Add $70 postage for air mail to foreign countries. Periodicals postage paid at San Francisco, California, and at additional mailing offices. **Postmaster:** Send address changes to Macworld, P.O. Box 54529, Boulder, CO 80328. Printed in the U.S.A.

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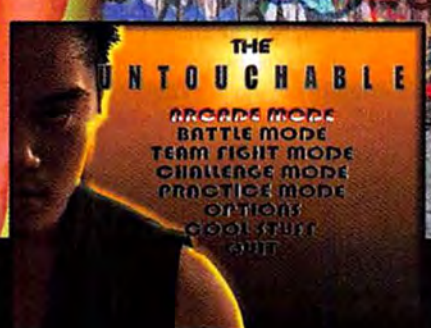

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The Desktop Critic

by David Pogue

The Simplicity Backlash

THE iMAC AND PALMPILOT SHOW MICROSOFT THE WAY

SHORTLY AFTER THE iMAC became the numero uno jaw-dropping record-smasher of all time, a funny thing happened. People began to believe that it is a whole new breed of machine—not a Mac, not even a computer, but some kind of cool-looking, super-simple Internet appliance. One stranger after another e-mailed me: "Are you going to write *The iMac for Dummies*?"

I'd reply: "You don't need such a book. *Macs for Dummies* has everything you need."

And they'd write back: "Oh, too bad. Well, maybe the bookstore has something on iMacs."

I'd sit there dumbfounded that Apple's marketing has been so effective in convincing the public that the iMac is something utterly new. (And believe me, it's been a long time since anyone used the words "effective," "Apple," and "marketing" in the same sentence.)

But come to think of it, the iMac isn't the only startling (although delightful) marketing phenomenon we've witnessed lately. How about the PalmPilot? This gadget is neither the cheapest, smallest, nor the most-featured handheld computer—yet it commands 65 percent of all palmtop sales, trouncing even Microsoft's PalmPilot look-alikes. Other palmtops have color screens, built-in modems, keyboards, PC Card slots—but not the PalmPilot. Have consumers lost their minds?

Not a bit. The iMac and the PalmPilot are both winners in a contest that many manufacturers don't even realize they're playing: the simplicity war. The iMac's success isn't based on price alone (plenty of Wintel boxes are cheaper still), nor on speed (plenty of Macs are faster), nor on its looks, great as they are. The one thing it's got over all other personal computers is the simplicity factor. In this regard, Apple's ads hit the nail on the head: you literally take this thing out of the box, plug it in, and turn it on.

Now *that* people can understand. The iMac comes closer than ever to the appliance Steve Jobs has dreamed about making since 1984. With any other computer, consumers must face the fear of the unknown (and the fear of assembly). But the iMac sets up like a cordless phone.

Simplicity has more than emotional payoffs, though: it also confers terrific technological benefits. The iMac has no SCSI jack—iMac owners will never have to experience the headaches of termination, SCSI IDs, and cable math. (Indeed,

no cables at all snake out from behind the machine—the phone and keyboard cables are the only ones that protrude, and they come out of the much more accessible *side* of the iMac. Why did it take the computer industry 20 years to think of that?)

Similarly, the PalmPilot, in its sweet gray-scale way, runs for two or three months on a pair of AAA batteries—compared with the 15 to 20 *hours* you can get out of a color Windows CE palmtop. And because its operating system is so compactly designed, the software programs available for it are models of stability and concise coding. A 75K PalmPilot application is considered a behemoth.

In other words, there's a simplicity backlash in this country, and clever tech companies are making millions from it. But wherever there's money to be made, one company is sure to show up to feed at the trough. Guess who?

"Simplicity is now a jihad at Microsoft," spokesman Greg Shaw told *U.S. News & World Report*. Bill Gates himself is leading the charge. After Windows gave him a typically ridiculous error message ("The DHCP client could not obtain an IP address"), he pounded out a 14-page memo outlining the company's new simplicity campaign, and e-mailed it to all Microsoft executives.

Now that's news; "Microsoft" and "simplicity" have *never* appeared in the same sentence before. Has Microsoft finally realized the error of its bloated ways? Has it finally recognized the value of tight, streamlined coding that serves a focused purpose?

Nah. Call me cynical, but excuse me: where was Microsoft's aversion to software bloat during the years when it was selling us 150MB software? Sounds like Microsoft, having watched its products approach end-stage featuritis, has realized that there's only one way it can keep selling us upgrades: by starting to *remove* the layers of complexity it's spent the last 15 years piling on. What a strategy! You know what? It can't lose.

No matter; I applaud simplicity in technology wherever it may be found. Besides, I can't criticize Microsoft for trying to capitalize on the simplicity movement—my latest book, *The iMac for Dummies*, just came out. ■

DAVID POGUE (www.davidpogue.com) is the author of *Tales from the Tech Line*, which is about average people confronting computer complexity.

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