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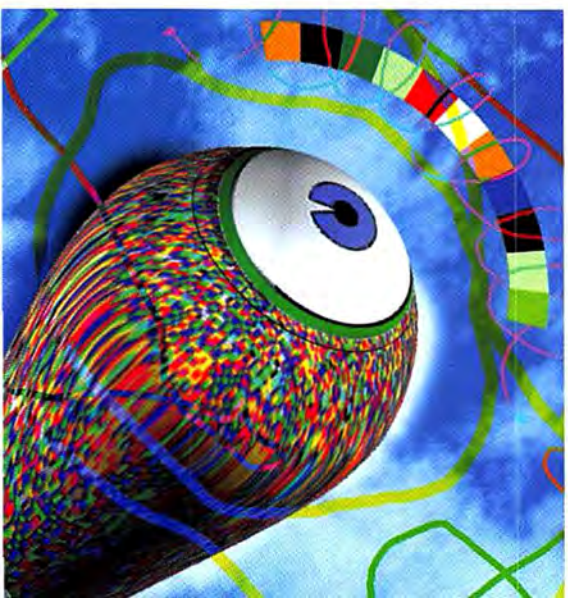

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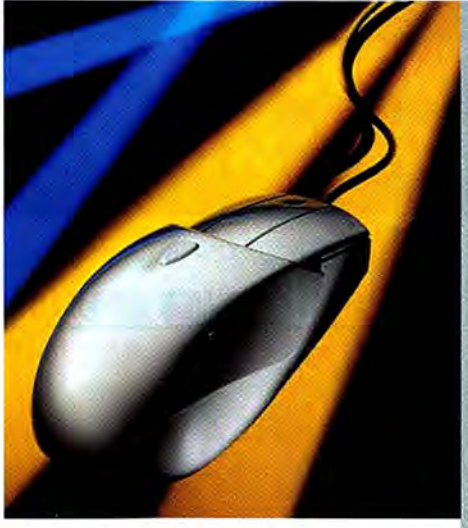

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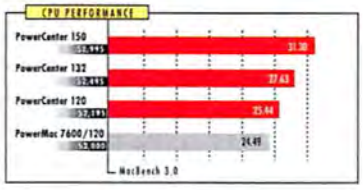

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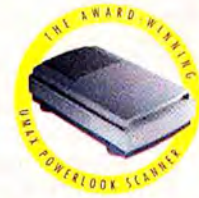

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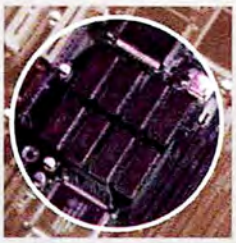
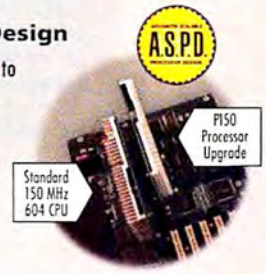
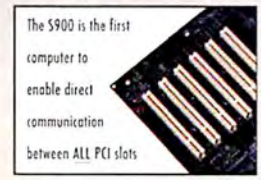


1 Interleaved Memory
Every S900 comes standard with 16MB of interleaved memory on the motherboard for fast memory access and best system performance. Others require the purchase of additional DIMMs to implement memory interleaved.

2 Advanced Scalable Processor Design
UMAX's exclusive A.S.P.D. provides easy upgradeability to dual processors or for higher speed processors as they become available. This modular configuration costs less and is far more flexible, allowing programs such as Photoshop to increase its performance up to 80% with the addition of a second processor card.



3 Exclusive PCI-to-PCI Bridge Not only does the S900 have an amazing 6 PCI slots, it is also the first to enable burst communication between them.



UMAX's exclusive PCI-to-PCI Bridge design enables direct communication between all PCI cards with the greatest performance, no matter which slots they're inserted in, also making it more expandable and easier to configure.

4 E100 I/O & Networking Card

To increase performance even further, UMAX offers the ultimate combination upgrade that gives you both Ultra-Wide SCSI and 100Base-T on one easy-to-install PCI card. The 100Base-T boosts data transfer over networks up to ten times the speed of standard 10Base-T connections. Ultra-Wide SCSI provides 16-bit wide data access at rates up to 40MB/sec. (4 times the speed of regular SCSI)

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* Suggested Retail Price

UPGRADE OPTIONS		PRICE*
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* Suggested Retail Price

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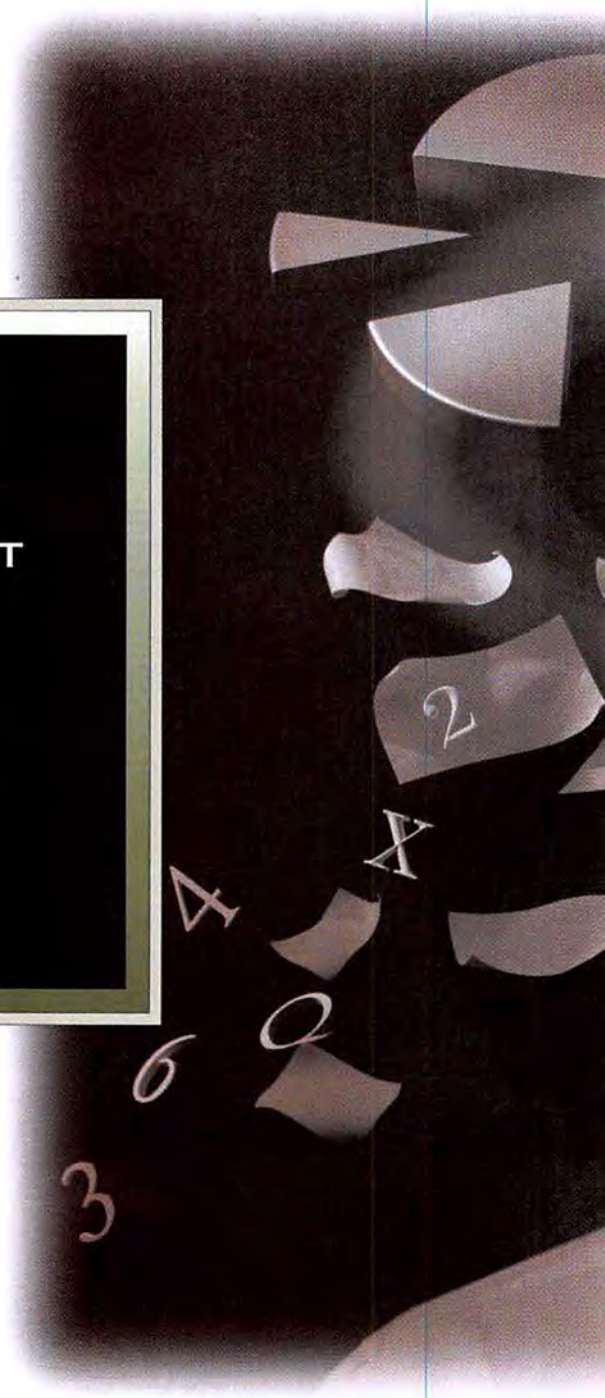

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Letters

Screwy PowerBooks

I HAVE NEVER WRITTEN TO THE EDITOR of a magazine, but I have a suggestion I feel compelled to share with you. When you print a tip that involves removing a plastic part on the front of a PowerBook (*Quick Tips*, May 1996), no matter how carefully you suggest removing it, please please please include a source for replacement parts. I am writing this on my beloved 520c with the plastic hinge cover dangling—every single clip broke off. I am convinced there is *no* way to remove the front panel without breaking the clips.

ART O'DEA
Newburyport, Massachusetts

I didn't think I was so nimble-fingered! Replacement front panels generally run between $9 and $15 (part number 9220789).—Ed.

Don't Need No Stinkin' DNS

I AGREE WITH YOUR AUTHOR ON HOW easy NetPresenz 4.0 is to set up and use (*Reviews*, May 1996). I've been using it (and the previous versions) for more than three years now, and it's an invaluable tool in distributing my freeware, Macintosh listserver Macjordomo.

But in the context of an otherwise good review, I have to disagree that "no built-in DNS" is a con. That's just plain ridiculous. Why should a WWW/FTP server come with DNS service? Do you know of *any* WWW/FTP server in *any* platform—Mac, Unix, Windows—that does that? NetPresenz does not make me coffee in the morning, either, but for the money it's the most useful shareware program ever written.

MICHELE FUORTES
New York, New York

Oh My God—Word 6.0

MAY'S *THE DESKTOP CRITIC* HAD ME rolling on the floor laughing. I debated for a long time if Word 6 was worth the price of admission. Despite the prolonged flame wars on the newsgroups, and *Macworld*'s less-than-enthusiastic review, I finally caved in and bought it.

During the past couple of months, I've learned something very valuable to me and other network consultants. The Mac version and the Windows version are so exactly alike that it actually makes my job easier. I no longer have to come up with three flowcharts in my head on how to do *X* to achieve *Y* on the Mac, on Windows, or on 95. Dare I say, Thank you, Microsoft? Wait—maybe not. They still make Microsoft Works, don't they?

MATTHEW SCHULTZ
via the Internet

IF DAVID POGUE IS RIGHT IN HIS CRITIcism of Word 6—and I most definitely think he is—then maybe we should wait for Word 7. And if Microsoft would pick up on many of Pogue's implied recommendations, they would quickly realize that they already have a great prototype available. I have been beta-testing it for a few years and really like it—it's called Word 5.

JAAP FEENSTRA
Rae-Edzo, Northwest Territories, Canada

I BELIEVE THAT MOST MACINTOSH users' shock and outrage might have been avoided had Microsoft simply named the application more appropriately: WinWord 1.0 for the Mac.

CHARLENE STROUP
via the Internet

A MAJOR CASUALTY OF THE UPGRADE not mentioned is the mathematical typesetting formulas. Word 5 gave the user a choice of using Equation Editor or formulas. As a high school math teacher, I find formulas much more efficient and easier than the clumsy Equation Editor. The formulas are useful in some nonmath work as well.

SAM CROPSEY
Honolulu, Hawaii

DAVID POGUE OMITTED THE MAIN reason I won't use Word 6. I have more than 400 glossary items in Word 5. Word 6 did away with the Glossary command and substituted Autotext, which is limited to 150 items. Excuse me? I can't figure out why anyone would want to alter a program to make it do less than the previous version.

DAVID STEINER
Lafayette, Colorado

continues

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Circle 4 on reader service card

CORRECTIONS

- *The Polaroid PDC-2000 does not use PC Cards ("Digital Cameras on the Move," News, June 1996).*
- *Neon Software's LANsurveyor 3.0 includes SNMP support for TCP/IP (Reviews, May 1996). A notification option enables LANsurveyor to scroll to and highlight a map icon when a device goes into alarm state.*

AS A WRITER OF MANY SCIENTIFIC articles, I find that the most annoying thing about Word is the way the formatting of the endnotes and footnotes gets completely screwed up when coworkers exchange Word 5 and Word 6 files, despite the files' previously appearing and printing identically on our respective versions and machines. Long live *any* other word processor.

TONY GIN
Christchurch, New Zealand

I DISCOVERED—THE HARD WAY—SOMEthing else that Microsoft has eliminated from Word 6. I was working long-distance with a client on a lengthy document that was broken out into legal-style numbers. The client said, "Take a look at paragraph 244.32.5." I whipped open the Find command, entered the paragraph number, clicked on OK, and then . . . *beep!* Word 6 no longer searches for its own automatic numbers. I had to scroll through a 400-page document for 5 minutes, at the end of which my client was mighty annoyed!

DOUGLAS L. LIEBERMANN
Skokie, Illinois

Heloise@Home

IN "HOME OFFICE BLUEPRINT" (MAY 1996), James A. Martin mentions Timeslips for recording time and expenses on projects. I've been using a much cheaper alternative in my consulting business for several years now. TimeSlice 1.3.4 ($40; Maui Software, 808/573-0011) has many advanced features, and there's a fully functioning demo available online. Mr. Modesitt of Maui Software is a dedicated Mac developer who keeps making his applications better and better.

PETER FLECK
Minneapolis, Minnesota

*Readers interested in TimeSlice can download the program from Maui Software's Web page (*http://www.aloha.net/~mauisw/*) or Macworld Online (*http://www.macworld.com *or keyword* Macworld *on America Online). Maui Software also makes TimeTracker 2.8.3, a less powerful version of TimeSlice, for $25, as well as FileMaker Pro and ClarisWorks templates to organize exported data. Both TimeSlice and TimeTracker come in German, French, Swedish, and Norwegian versions, too.—Ed.*

Tales from the Encrypt

IN GENERAL, I SUPPORT THE ARGUMENT presented in "Civil Rights Activists Say, 'Sniff This!'" (*Viewpoint*, May 1996), but as a resident of Italy and a Macintosh user, I have to report that using Zimmerman's exceptional work, PGP, is neither as easy nor as simple as your concluding paragraph implies.

First, European users are restricted to a "corrected" version of PGP—slightly less powerful than the U.S.-Canada version, but still potently impenetrable. Second, learning PGP for Mac requires almost as much work as doing brute-force decryption, and I admit defeat there. Rumor persists of a user's manual for Macintosh, but I haven't been able to locate it.

While I like the idea of nuisance encryption, I am unable to practice it, and have reluctantly dumped PGP into the untouchable vastness of the Trash.

ROBERT D. CALLAHAN
Montanare di Cortona, Italy

DENISE CARUSO IS CORRECT THAT we are all harmed by bills such as the bipartisan Telecommunications Reform Act. And she is correct that we *all* need to take action against this kind of intrusion into our lives by government. But her suggestion that we encrypt our messages is almost like giving up, and only finding a way to live with such bad legislation. Instead, we need to protest at the voting booth.

GEORGE REIS
Santa Ana, California

I COULDN'T AGREE MORE WITH DENISE Caruso—everything should be encrypted. But the political statement of doing so needs to be followed by the political act of disempowering those cur-

continues

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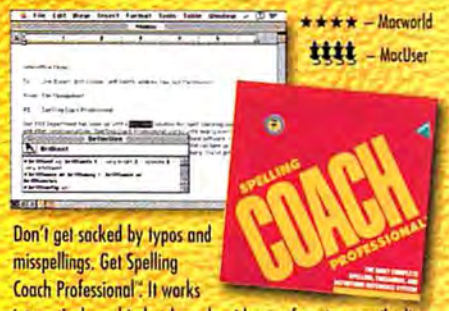

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rently spying on us and all those hoping to do so in the future. I hope computer users as a group develop the political savvy and the cohesiveness necessary to accomplish this.

PATRICK L. LILLY
Colorado Springs, Colorado

The Trouble with Netscape

I AM TYPING THIS MESSAGE IN THE VERY E-mail interface described in your review of Netscape Navigator 2.0 (May 1996), and it most certainly does support quoting E-mail in replies. In fact, there are two ways you can do this: (1) at the top of the window that comes up after clicking the To: Mail button are five buttons—Send Now, Quote, Attach, Address (book), and Stop; and (2) it is possible to quote original messages by default by checking a box in the Composition section of Mail and News Preferences.

CHRIS HANSEN
via the Internet

ABOUT THE USENET NEWS-READER interface in Navigator 2.0, it's unnecessarily complicated, yes, but once properly configured it works like a charm. You have to see it to believe the speed—it's faster than any other news reader.

KRISHNA MOHAN
Valsyn North, Trinidad, West Indies

I FOUND MATTHEW HAWN'S REVIEW OF Netscape 2.0 overgenerous. I've been using Netscape since its initial version and I consider 2.0 the worst one yet. I like the idea of an all-in-one browser/news-reader/E-mail program, but this new Netscape is not it. I even downloaded Microsoft's Internet Explorer in an attempt to end my suffering. What we need is a lean, mean browsing machine—not an overweight, underfeatured, unreliable one.

CLINTON KRENBRENK
Saint Albert, Alberta, Canada

NAVIGATOR 2.0 IS INNOVATIVE, NO question about it. The problem is that Netscape is pushing the envelope on sexy stuff, like JavaScript and plug-ins, while ignoring more basic issues like stability and HTML compliance (there are any number of useful, standard HTML tags that Navigator does not support and that the company has evidently promised will remain unsupported).

Is Navigator the best browser available? Probably. Is it top-quality software? No. Since Netscape has faced relatively little real competition in the browser wars, users must hold the company's feet to the fire and demand better. Giving the product four stars is being a little too nice, and sending the wrong signal.

ADAM RICE
Austin, Texas

RedShift Redux

I JUST FINISHED READING YOUR REVIEW of RedShift 2 (May 1996). A not-so-obvious con is the lack of an Input New Objects Found feature. A recent example is comet Hyakutake. I wanted to use RedShift 2's wonderful texture mapping to create a movie of the comet's path, only to find that RedShift doesn't support that feature. Maris's tech support told me that because the database is on a CD-ROM, additions aren't possible. Why? Voyager II by Carina, also on CD-ROM, allows Input New Objects Found, but Voyager II doesn't have the texture-mapping capabilities of RedShift 2. I use both programs for astronomical applications; both are excellent, but RedShift's inability to add new objects should be taken into account when purchasing astronomical software.

MICHAEL E. GAINES
Morris Plains, New Jersey

Credit Where It's Due

NICE JOB ON YOUR REVIEW OF THE current crop of conjuring CDs (*Reviews*, May 1996). I just wanted to drop you a note to tell you that the uncredited "witty . . . likable . . . showman" performing the effects on the Magic: An Insider's View CD-ROM is Marc DeSouza.

TRACY EVANS
Missouri City, Texas

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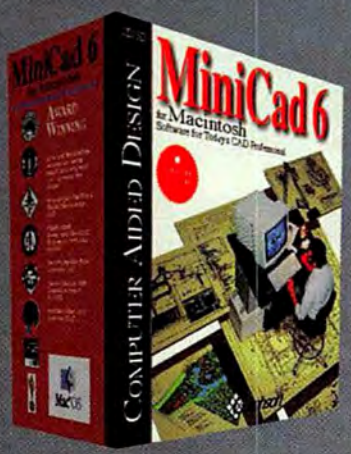

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Circle 46 on reader service card

by Adrian Mello

Apple Articulates Its Internet Plans

CAPITALIZING ON THE MAC'S STRENGTHS

People often experience the Internet by flitting from site to site, riding a wave of information. Apple CEO Gil Amelio proposes that Apple insinuate itself into the Internet, using the wave of change that the Internet is bringing (he calls it a *megatrend*) to propel Apple out of the water and toward firmer ground.

Apple doesn't just have a strategy—it now has a dedicated Internet division called AppleNet, headed by Dr. Larry Tesler, vice president of Internet platforms and chief scientist. AppleNet is part of the companywide restructuring Amelio announced at Apple's Worldwide Developers Conference in May (see "News Extra," *Macworld*, July 1996, "Apple's New CEO Gets Tough"). Akin to a state-of-the-union speech, Amelio's address outlined Apple's technology plans for the coming year, to the people who need to implement them—Apple developers, both within the company and outside.

No mere reorganization, this is quite a significant move. From a public-relations standpoint, putting a vice president in charge of a division signals Wall Street analysts and Apple's investors that the company is seriously focusing its efforts.

From an internal, strategic point of view, the new division provides a focal point for Apple's many Internet projects. Amelio is taking a page from the book of one of the most successful computer companies in the business: Microsoft. Microsoft might not always have the best technology, but it always shows, convincingly and in great detail, how its products work together and how they fit into the marketplace. Creating an Internet division gives Apple the same opportunity.

What Apple Promises

Tesler says Apple's strategy will address accessing, creating, and delivering Internet content. The company's goals are to make using the Internet easier and to make the Internet more media-rich.

Apple is shipping Macs with at least 12MB of RAM, a 28.8-Kbps modem or on-board Ethernet (depending on the model), and Internet connection software—guaranteeing that with only a few clicks you can get on the Internet. In the longer term, Apple plans to integrate Internet services into the Mac OS using Java, Sun's popular development environment for the Internet, and OpenDoc, Apple's component architecture.

At the heart of Apple's Internet strategy is OpenDoc, potentially the company's most powerful lever. Components are key to creating the next generation of software, and Internet technology is OpenDoc's best advertisement. "OpenDoc by itself is not enough," Amelio said. "We need to . . . marry it up with Java." Tesler said of Java, "We're going to put it everyplace," including inside the Mac OS.

The move toward adoption of OpenDoc to create major, mainstream desktop applications is still a trickle, but many developers are creating parts to display or work with Internet content. OpenDoc's components technology allows every OpenDoc part to be used instantly with any OpenDoc app. Based on demos we've seen at *Macworld*, this works smoothly.

Apple also promises to make the kind of mark on the Internet that it made on the desktop with the Mac OS. "Apple's mission has always been to make complex technology simple," Amelio said at WWDC. "We did it with personal computers, and we're going to do it with the Internet. . . . We want to seamlessly build the Internet right into the Mac OS, so you have this very agile connectivity between working locally and working on the Net and really don't have to sweat the subtle differences. We don't want you to have to log on. We just want it to be there."

There are precedents. From the beginning, AppleShare client software and a LocalTalk connection shipped with all Macs (as did Personal File Sharing later), making it easy to connect to a network (much easier than for PC users). Furthermore, Apple pioneered the graphical browsing of network resources with the Chooser, a feat that has never been bested. One major complaint about the Internet is that it's not easy to use—Apple could solve that problem.

Playing to Its Strengths

The second part of Apple's strategy is to extend its dominance in content creation to the Internet. The Web has pushed the Net into the graphical arena, where Apple excels.

More specifically, Apple's commitment to meld its QuickTime Media Layer—QuickTime, QuickTime VR, QuickDraw 3D, and QuickTime Conferencing—with the Web and to deliver it simultaneously on Mac and Windows platforms would define a significant role

continues

HANK OSUNA

on the Internet. Just getting QuickTime into Web applications bodes well for Apple—QuickTime is the best technology in its class, it has been leveraged well, and it has that Apple mystique.

If the Mac is to remain the premier content-creation platform, the standards on which it depends must be ubiquitous on both the server and the client side. Apple must help the Web become even more media-rich while dealing with the limits of bandwidth. Here again, Amelio is focusing on a solid, existing market niche that Apple can fill.

Even though one of Apple's strengths is content creation, it competes with Netscape and Microsoft for developers' resources. Apple needs third parties—like Adobe, which made Apple the dominant media-creation platform—to develop Internet applications that rely on its technology and to help make the Mac the premier Web content-creation tool.

The final part of Apple's strategy is the server side, and although this has improved, it could be better. Apple has never really understood the demands of the high-performance server market. As a result, the Mac OS continues to fall short in performance and flexibility when stacked up against true, hard-core server operating systems like Unix and Windows NT. Tesler's approach at WWDC was essentially to talk louder about Apple's line of Internet servers, but this doesn't address the real problems. Apple needs to talk smarter, not louder.

Apple should give up high-end Mac OS server dreams, period. There is now and always will be a need for big, powerful, networked boxes that hold and distribute lots of data very quickly. There will always be big, powerful companies that will enthusiastically bury Apple if it tries to compete in that market. Apple has the keys to its high-end server strategy in its hands: the AIX-based Network Servers 500/132 and 700/150. The company should license and sell NT on PowerPC alongside its Network Servers and work on what it knows best: desktop, peer-to-peer connectivity. Adding multitasking in Mac OS 8 (the official name for Copland) and increasing CPU speed via faster PowerPC chips will make the Mac desktop powerful enough to act as a personal server. This exploits the Internet's strongest potential—people talking to people over a decentralized network. Again, Apple has the keys to this strategy.

Apple has always been about making computing personal—it should not abandon that vision. Tesler said Apple would integrate Web-server technology into the OS, and this is exactly the right thing to do.

The Right Direction

At the conference, Amelio announced that Apple has an Internet strategy, but it isn't too far wrong to say that the Internet *is* Apple's strategy, and it's not a bad one. Internet users are screaming for a system that's easier to use and carries richer media types than just text, and nobody is stronger than Apple in both those areas. Given the attention the Internet has received in the past year, it seems as if Apple is just now catching up with the Internet. But when you consider Apple's strengths, you could say that the Internet is just now catching up with Apple. **m**

Research by CAMERON CROTTY, ELIZABETH DOUGHERTY, and MATTHEW HAWN.

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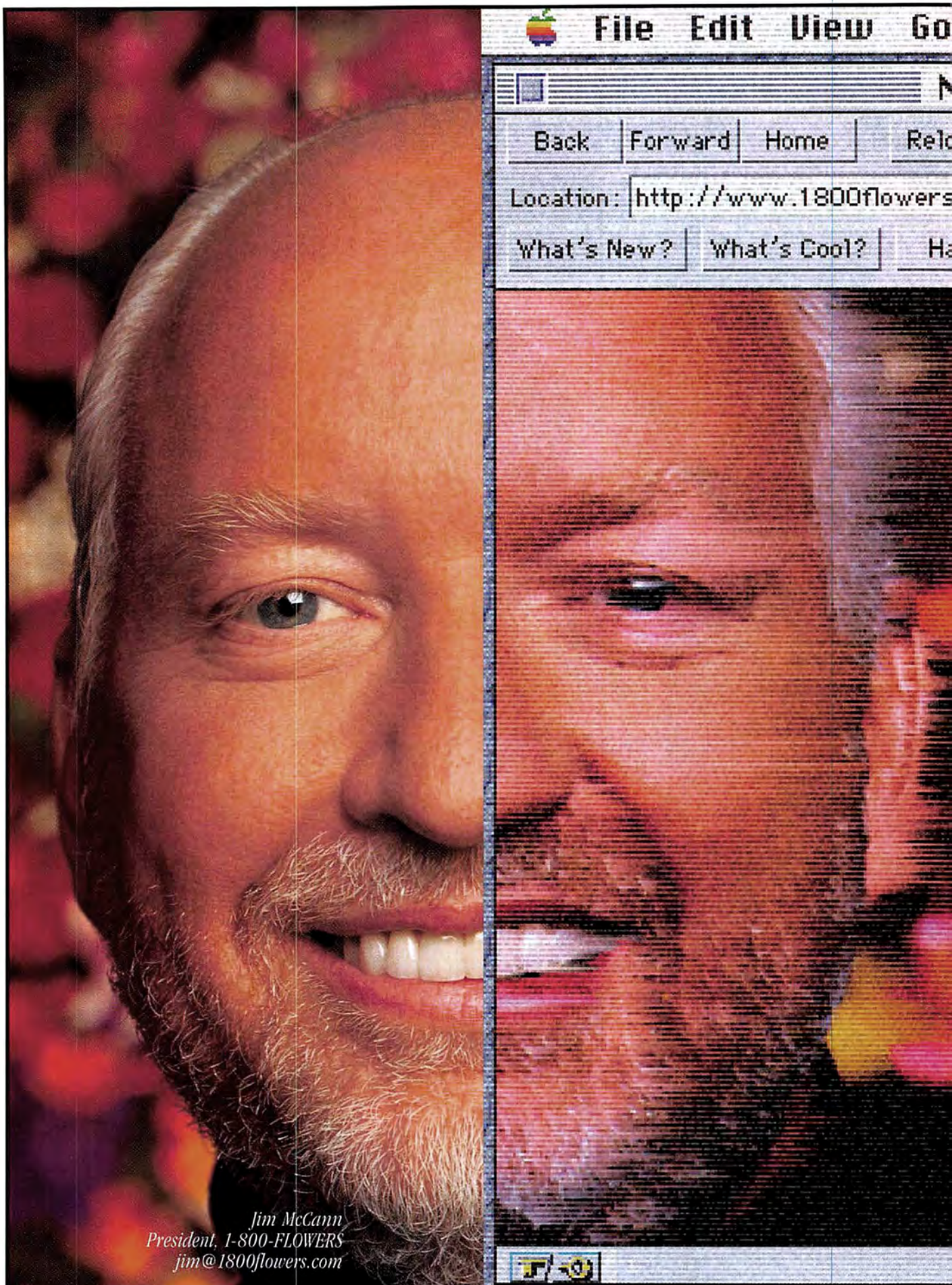

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by David Pogue

PowerQuickColumn Pro 1.0.2v4b

A PROPOSAL TO MAKE MAC PRODUCT NAMES THE BEST ON EARTH

THE OTHER DAY, I WAS dumbfounded to read about a program called Movie Cleaner Pro. Now, I don't dumbfound easily. But after a moment, I realized what bothered me: here was an otherwise nifty brand-new program with the word *Pro* in its name. To me, that's a violation of the unwritten law that says: You can only add the word *Pro* to your program's name if there is, or was, a non-Pro version. FileMaker, MacWrite, DiskDoubler, Eudora—each became Pro only when a dramatically enhanced new version appeared.

Trivial? Yes, but names are important, especially in an industry as hype-happy as computers. Mac product names have historically reflected the Mac's superiority. In the Windows world, for example, there seems to be a law that product names must contain inscrutable numbers, inscrutable capitals, or both. The June 1996 *Windows* magazine, for example, reviews such products as ECCO Pro, pcAnywhere32, dtSearch, Visio, and CorelXARA—ahhh, poetry. For the Mac, on the other hand, we have great descriptive, evocative names like Photoshop, Spell Catcher, Panorama, LogoMotion, and Cyberdog (love that!). Clearly, this is a tradition worth keeping alive.

Therefore, for the benefit of new companies that have been doing things like slapping *Pro* onto first-time program names, allow me to hint at a better naming-and-numbering protocol. Adopt it, live long, and prosper.

Dare to differ: Use spaces.

If you have ever glanced at a Mac catalog, you might have gotten the impression that product-naming committees have broken spacebars. We've got FolderBolt, WordPerfect, and FastBack. MacLinkPlus, TextureMaker, and even—get this—MyAdvancedLabelMaker.

Would sales of such name-impaired software as CalendarMaker, VideoDirector, or EmployeeManualMaker really suffer from the presence of spaces? I doubt it; such correctly spaced products as RAM Doubler, Speed Doubler, and Snap Mail seem to sell OK.

Having once taken a course in Pascal programming, I think I know where this tradition came from. As I recall, you couldn't use spaces in your software instructions. Commands like ReadLn and GoTo roamed the earth. These ancient OneWord commands' descendants linger even today—in Word 6's dialog boxes, for example, or in Internet addresses.

Originally, then, someone probably thought it would be cute and different to name a computer program without spaces. Ironically, today you're distinctive if you *don't* omit the spaces.

Enough with the InterCaps.

Of course, if you're going to leave out the spaces, you're going to need some means of indicating where one word ends and the next begins. The solution is InterCaps, where a letter in the middle of the name is capitalized. Apple is certainly guilty here—it can't seem to name products without a capital letter in the middle. AppleTalk. QuickTime. PowerBook.

And now we're raising a generation of shift-key illiterates. Product-naming committees have InterCapped names that were originally single words—FreeHand and StoryBoard, for example. Software companies are now leaving lowercase letters that *should* be capped, as in the names xRes and theTypeBook (ugh). And in day-to-day correspondence I've even seen some people mistakenly add InterCaps in names that don't actually have them, like *Macworld* and Photoshop.

If you'd like to see where the InterCappization of America is taking us, visit cyberspace. Hang around on America Online, and you'll meet teenagers who, in some weird mutation of InterCap insanity, now tYPe EvERydAy e-mAiL meSSaGes lIKe tHiS.

Pick a prefix besides Quick or Power.

In the eighties, the hot suffix to indicate newness and improvedness was *Plus*. FileMaker Plus, Reflex Plus, Macintosh Plus.

Today, it's *Quick* or *Power*. QuickTime, QuickTake, QuickDraw, QuickBooks, QuickCam, QuickMail. PowerBook, Power Mac, PowerCurve. Not to mention Power Translator, -Tools, -Merge, -Draw, -CADD, and -Print.

Hey, amigos, let's move on. *Quick* and *Power* are so overused that they no longer have meaning. Not that they ever did—anyone who's tried to download QuickTake photos into a Mac knows what a misnomer that one is. And now that the

continues

CHRIS LENSCH

The Best and Worst Mac Product Names

There's no televised special to accompany the awarding of these honors, but somebody's got to do it.

The Five Best Names

- TelePort (Global Village): A two-way pun, combining *telephone* with your modem *port;* the modem can be said to teleport you to another location. (One-way puns, by contrast, aren't as satisfying. For example, SitComm is indeed a blend of *StuffIt* and *communications*—but has nothing to do with TV shows.)
- Cyberdog (Apple): It fetches on command, just as the name implies.
- PaperPort (Visioneer): Describes the gadget; nice alliteration.
- CanOpener (Abbott): Another two-way pun. The program pries open any file, like a can opener, and the name speaks its motto: "I can open 'er."
- PageMill, SiteMill (Adobe): Nice juxtaposition of the modern (Web pages, sites) with the traditional (mills). I can see the copycats now—RAMMill, SpeedMill, SpreadSheetMill . . .

The Five Worst Names

- Faxstf (STF Technologies): Meaningless, and you can't even pronounce it.
- WOW (CompuServe): A new online service. Cornball beyond belief. Gag me.
- FotoFun (Fargo): Terrific photo printer, but would it have diminished FotoFun's appeal to spell the name right?
- ScruTiny in the Great Round (Calliope): It's a CD-ROM, but you'd never know it. Not only conveys no information, but implies a double entendre.
- Performa (Apple): True, focus groups have shown that consumers like names ending with *a* (to wit: Honda, Toyota, Acura). But this one sounds like Sylvester Stallone trying to pronounce "Performer."

feeblest, cheapest Mac available is, in fact, a Power Mac, the *Power* prefix isn't even serving its purpose of differentiation. See also Gilbert & Sullivan, "When everyone is somebody, then no one's anybody."

We should keep an eye on the *Doubler* suffix, too. It's also showing signs of Creeping Cliché Syndrome. After doubling our Disk, RAM, Speed, CPU, and Net, we don't want to dilute that one into meaninglessness as well.

Separate your company's name. Microsoft invented the practice of including the company's name in each product title: Microsoft Word, Microsoft Excel, Microsoft Works, and so on.

These days, everybody's doing it. Companies imagine they're slyly building a corporate image, reinforcing the company name, by making you associate the program you own with the company that made it. Claris follows this naming practice (ClarisWorks, ClarisImpact, Claris Organizer). So do Quark, Netscape, and others.

Oddly enough, this strategy worked so well that it backfired. Today, the aver-

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age, non-guru-level Macintosh user remembers *only* the company name. You hear people say, "I wrote that document in Microsoft" when they mean Word, or "I'll just use Claris" when they mean ClarisWorks. The company-name-is-the-product scheme blew up in Quark's and Netscape's faces even more dramatically—some people I know would never recognize the actual software names, XPress and Navigator, if they heard them. That's how accustomed they are to using the company names, Quark and Netscape, to refer to the programs they use.

One decimal point per number.
Product names aren't the only things in chaos—version numbers need help, too. I mean, look at how software companies have fallen into numbering disarray: Apple uses the mathematically questionable Two Decimal Points method ("System 7.5.3"). Claris uses a *v* in place of the second decimal point; ClarisWorks is up to 4.0v4. Microsoft, on the other hand, waffles between using a letter (Word 5.1a) and using two decimal points (Word 6.0.1). Blyth uses logic I can't fathom at all; its current product is called Omnis 7 version 3.5. Riiiight.

Frankly, life would be much simpler if companies would just number their versions with sequential integers: version 1, version 2, and so on. We'd all be using System 68, and it'd be no big deal.

But I suppose the Two Decimal Point system would have its merits if everyone abided by The Scheme. Which is: a software revision made exclusively to kill bugs or for compatibility affects only the hundredths place—from version 2.01 to 2.02, for example. (Such an update should be free and available as an updater online.) Any revision that actually adds features changes the number's tenths place (2.3 to 2.4). And if the rewrite is so dramatic that the document file format changes, the integer changes (5.0 to 6.0).

Fortunately, most software companies do abide by the aforementioned, but undocumented, Scheme. Nonetheless, I have a concern about that second decimal point. What, exactly, is the point of that point? It's a huge productivity killer: if we 23 million Mac fans each mention such a program once a day, and the extra syllable takes a third of a second to pronounce, we waste 11 people-weeks a year just speaking the superfluous decimal point. Why don't we all agree to drop the point itself, and just say "System 7.53"?

The Upshot
Look, I know how hard it is to come up with good product names. The obvious ones have already been trademarked by somebody, and each one you run up the flagpole entails another costly trademark search by another costly lawyer.

On the other hand, the difficulty faced by the namers at software companies is often exactly what drives them to creative extremes—and to really clever, terrific names.

Now, if you'll excuse me, I'm going off to get a QuickSandWich Pro 3.2v1a with TurboTomato, xLettuce, and PowerTurkey. **m**

If contributing editor DAVID POGUE were a software company, his current books would be *MacsForDummies 4.0*, *MoreMacsForDummies 2.0*, and *MacworldMacFAQs 1.0* (IDG Books Worldwide, 1996, 1996, and 1995).

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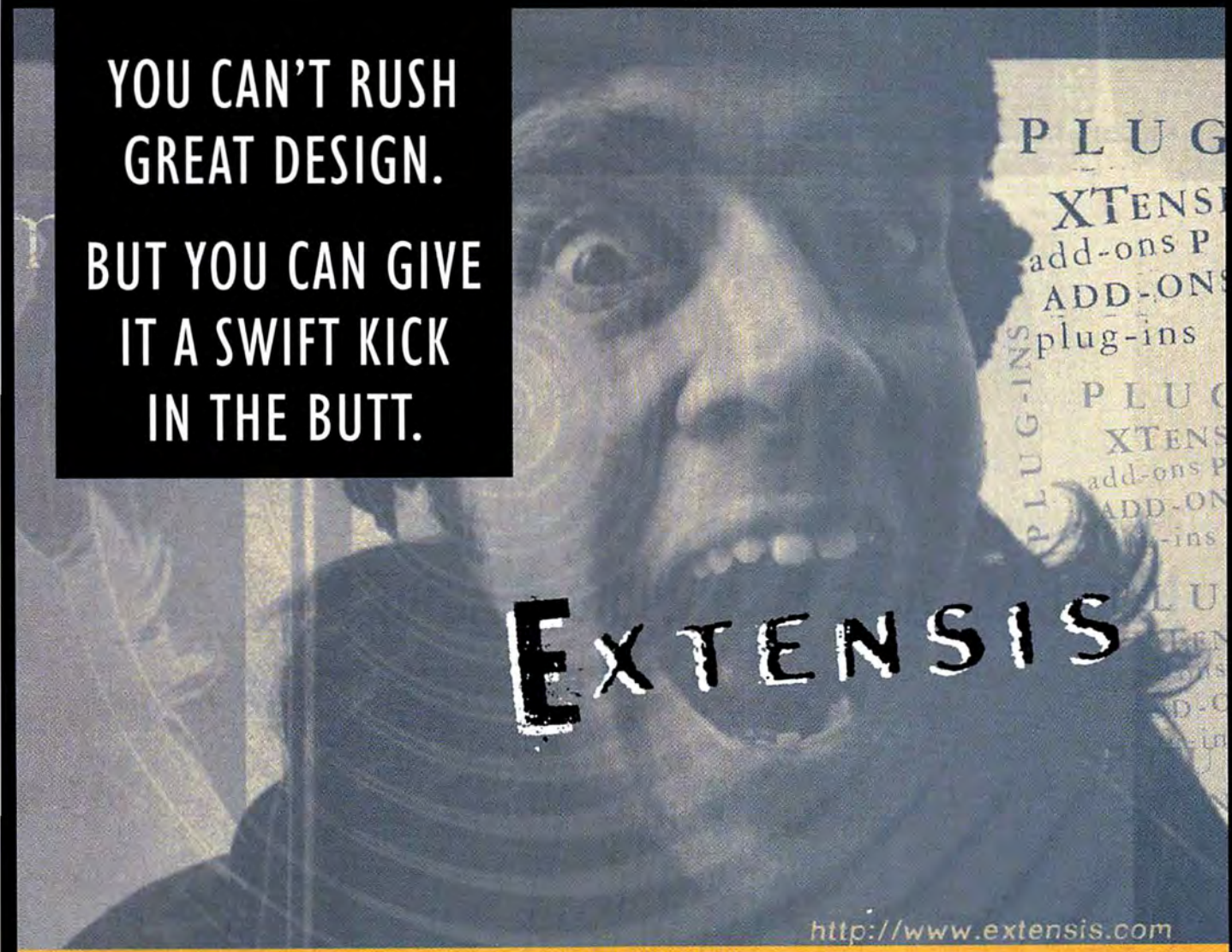

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Circle 13 on reader service card

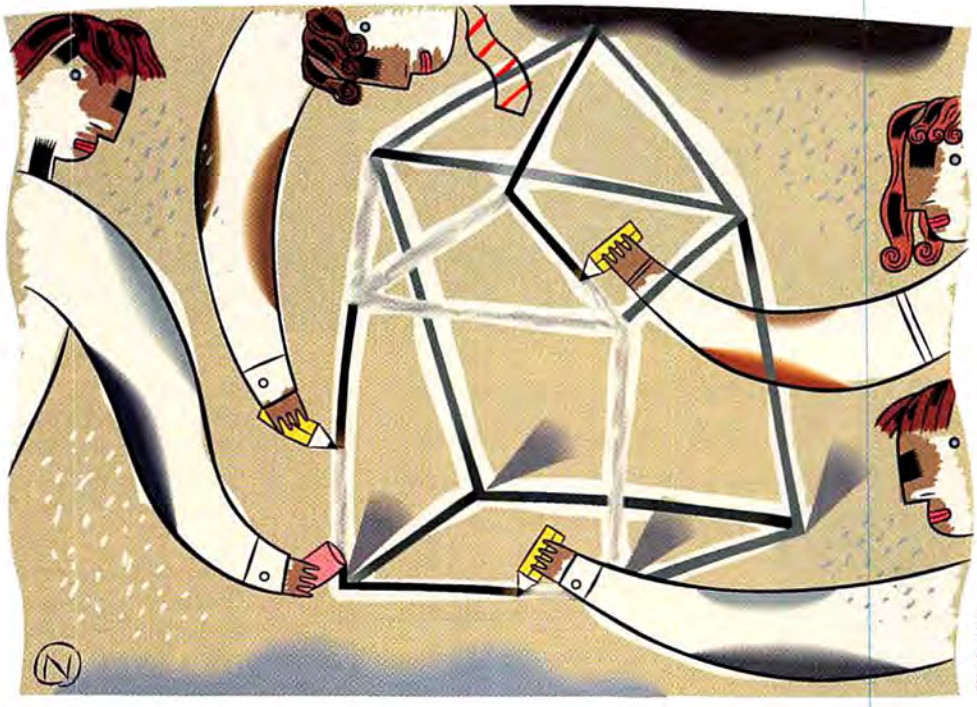
News

science/engineering

Mac CAD Does Fine without AutoCAD

PC GIANT'S DEPARTURE LEAVES USERS, CAD DEVELOPERS UNFAZED

by Charles Seiter



JEFF NEUMANN

Although the Power Mac is the cheapest workstation-level computer on the market, two major vendors—AutoDesk and Claris—recently dropped out of the hotly contested Macintosh CAD market. What happened to PC CAD powerhouse AutoDesk? Is the Mac CAD market drying up, or is it merely a tough nut to crack? *Macworld* talked to CAD users and leading CAD vendors to find out.

AutoCAD's Tragic Tale

The bombshell news hit last year, when AutoDesk, the largest PC CAD software vendor (selling nearly 240,000 units last year, more than the entire Mac CAD market), announced that it wouldn't update AutoCAD to a Power Mac–ready Release 13.

Although AutoCAD never reached AutoDesk's ambitious (50 percent or more) market-share goals on the Mac, Power Macs still represent a much larger (70 percent) CAD market than specialized systems, such as those based on Digital's Alpha processor, for which AutoCAD did develop Release 13. AutoDesk claims it took nearly as many in-house programmers to support the Mac version as it did Windows, and that the Mac sales didn't provide enough return on the investment (after Release 12 came out, AutoCAD's market share dropped from about 20 percent to about 15 percent).

Two main problems faced AutoCAD's assault on the Mac market. First, beyond its position as an industry standard, there wasn't much to motivate CAD users to switch to AutoCAD—most users complained about the slow performance of both releases 11 and 12. And while AutoCAD's strength was in mechanical and engineering design, it lacked architectural design features that had become favorites for Mac CAD users.

Second, unlike, say, word processing or graphics software, adopting CAD software is a major commitment—a company typically spends much more on training than on the software itself. AutoCAD was a relative latecomer

to the Mac market, and only 15 to 20 percent of Mac-based firms using CAD were willing to face the downtime associated with a major changeover to AutoCAD.

AutoDesk wasn't the only company having difficulty breaking the loyalty barrier in the Mac CAD market: disappointing sales forced Claris to abandon Claris CAD last year.

They'd Rather Stay Put

Historically, Macintosh representation in the various areas of mechanical engineering has been weak, but the Mac still has a big chunk (25 to 30 percent) of the architectural and design CAD market. Reports from the field indicate that most of these design houses are staying with the Mac.

Macworld interviewed key people at several Mac-based design firms and found them indifferent to AutoDesk's departure, and happy with both their platform and their current CAD software.

Bradley Skaggs at the San Francisco office of Studios, an international architectural design firm, has a typical story: "We switched to AutoCAD for a while because one major client insisted on it. It was too slow, and the staff was complaining. I can see why some mechanical engineers might like it, but we didn't. When we had to decide between AutoCAD as software and the Mac [as platform], we chose the Power Mac–ready version of Graphisoft's ArchiCAD, and now are happily using it in our offices around the world. The Power Mac is a great, cheap CAD platform."

Picking Up the Pieces

Not surprisingly, the remaining Mac CAD players welcome a less crowded playing field.

Richard Diehl, president of Graphsoft (410/290-5114, *http://www.graphsoft.com*)—the current Mac CAD market-share leader, with possibly as much as 50 percent of the market—says the departure of AutoDesk is an opportunity for his firm. Graphsoft's MiniCad 6 shipped several months ago in both Mac (see *Reviews*, March 1996) and Windows versions, and the company has been busy running demonstrations at mixed-platform design shops, particularly architectural firms, that refuse to junk their Macs in the wake of AutoCAD's disappearance.

Diehl also notes that as Power Macs speed up, CAD vendors will concentrate on automating existing drafting and modeling functions rather than mere addition of new features. Instead of requiring users to do interactive modeling in 3-D space, vendors are building considerable (and computationally intensive) "intelligence" into their software to create 3-D models automatically from the 2-D drafting documents most engineers and architects were trained to draw.

Laszlo Vespremi, director of product development at Graphisoft (415/737-8665, *http://www.graphisoft.com*), ArchiCAD's maker, agrees with Diehl's assessment. Both companies are planning software that will be able to generate realistic 3-D walkthroughs, including textured surfaces, for buildings specified mostly by traditional 2-D drafting CAD files. These applications will take advantage of the ultra high speed Power Macs expected to arrive later this year.

"The big question," Vespremi says, "is putting the new extra power to best use." Most CAD vendors for Macs and PCs used to add features each year that made their software more comparable to the CAD programs that ran on the fastest Unix workstations. Now, with the fastest Power

continues on page 46

DOUG ROSS

publishing

Adobe's New Web Course

COMPANY LOOKS TO INCREASE INTERACTIVITY ONLINE AND IN PRINT

by Macworld Staff

Seeking to put its graphical imprint on the Web, Adobe Systems (415/961-4400, *http://www.adobe.com*) is developing technologies—including an interactive authoring tool and a Web version of Persuasion—to make the Web a richer publishing medium.

Web Graphics Go Hi-Fi A portable 2-D imaging standard, code-named Bravo, will give developers an API for displaying, printing, and managing high-res images, line art, and text for Web graphics.

Adobe claims Bravo will offer film-level quality, along with the ability to display, save, replay, and print 2-D text

and graphics—even on low-end Internet systems.

Although based on Adobe's PostScript, Bravo isn't tied to a specific font technology. It's expected to be delivered on various platforms, including Windows, Mac, and Solaris.

While Bravo is already used in Photoshop, Illustrator, Acrobat, and other Adobe products, Adobe's first new Bravo-based application, code-named Vertigo, is due next year. JavaSoft has announced its intent to use Bravo in a future implementation of Java.

If Bravo is the imaging model, Vertigo is the player. By bringing interactivity to the Bravo/Java team, Vertigo will let content providers combine graphics, sound, and video. It promises to be the first authoring tool to link sophisticated animation and interactivity with Bravo's high-res graphics capabilities.

Intranet Printing Last year printer companies began quietly adding Internet connectivity to their products. GCC Technologies unveiled WebAdmin for its Elite XL laser; Tektronix announced PhaserLink for its color printers. Both ROM-based utilities let you choose, configure, and print to any Web-enhanced printer from a Web browser.

At the next level is Adobe's PrintMill, due by year's end. Unlike those utilities, PrintMill installs on a Web server, making any network printer browser-accessible and eliminating the mishmash of drivers, Chooser setups, and Print Managers normally faced by multiplatform users.

Also, Adobe and Microsoft announced their intent to merge Type 1 PostScript with TrueType, creating a font format called OpenType for use on the Web and eventually in printers.

Presenting on the Web Finally, Adobe is developing a Web-based presentation tool. Code-named Web Presenter, it will let your presentations combine Web links, multimedia elements, photos, and illustrations.

Reported by BARBARA ASSADI, LINDA COMER, and SUZANNE COURTEAU.

graphics

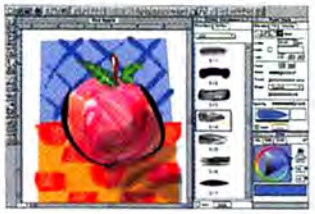
Natural Media Meets Vector Drawing

FIRST FRUIT OF FRACTAL AND RAY DREAM UNION

by Cathy Abes

Hot on the heels of their recent merger, Fractal Design (408/688-5300, *http://www.fractal.com*) and Ray Dream are introducing their first offspring: an object-oriented illustration program that lets you draw with fluid, paintlike effects.

With tools that parallel Painter's, Fractal Design Expression lets you create *strokes*—resolution-independent PostScript paths editable with standard drawing tools such as freehand, Bézier-pen, polyline, and B-spline tools. And the transparency feature lets you layer strokes to enhance the natural-media look.



Fractal Design Expression lets you create vector-based art with paint-style brushstrokes.

Expression provides three kinds of strokes: Natural-Media strokes for creating paintlike effects; graphic elements (defined objects similar to clip art), and Multi-View strokes, which can combine the other two and be animated. More than 150 strokes and 200 graphic elements will ship with the program.

Expression supports multiple undos, layers, and pressure-sensitive tablets. It provides Mac and Windows file compatibility; reads and writes Adobe Illustrator and CorelDraw files; and exports to Adobe Photoshop 2.5, TIFF, BMP, PCX, EPS, AVI, and QuickTime.

Due by fall, Expression will retail for $449 (street price will be under $300), $199 for owners of Painter or Ray Dream Studio.

Incredible Shrinking Mouse

MOVABLE SHELL ADAPTS TO FIT YOUR HAND

We've seen them all—mice with ergonomically designed contours, extra buttons, and even one with ears. But now there's the Adjustable Mouse from Alps Electric (408/432-6000, *http://www.alpsusa.com*), with a movable shell that lets you alter its height and angle to fit small, medium, or large hands more comfortably. In addition to assigning single-button functions, you can also use the *chording* feature to assign any of nine preset operations to any combination of buttons. For example, you might set the left and center buttons to perform the Copy function when they're pressed in unison. Available now for $40, the Adjustable Mouse comes with a six-foot cable and plugs into any ADB port. —CATHY ABES

ARNOLD TIOSEJO

communications

The Race for Bandwidth

PHONE AND CABLE COMPANIES FIGHT AN UPHILL BATTLE

by Cary Lu

As demand for data bandwidth rises, the information superhighway's infrastructure is struggling to keep up. In an Internet-mad world where 28.8-Kbps modems and even 128-Kbps ISDN lines no longer seem fast, both telephone and cable companies are racing to offer higher-speed data connections. But despite all the hype you've been hearing, don't expect to find a fast, cheap connection anytime soon.

Within the next couple of years, phone companies plan to offer several kinds of DSL (digital subscriber line) connections using the ordinary copper phone lines that already run into your home or office. You'll even be able to make a voice call and a DSL connection simultaneously on the same line. High-bit-rate DSL (HDSL) will run at 384 Kbps bidirectionally; asymmetric DSL (ADSL) will initially run at 1.544 Mbps *downstream* from the phone company to you, and 64 Kbps *upstream* from you to the phone company. Later versions of ADSL should run at up to 6 Mbps downstream and 640 Kbps upstream.

Phone versus Cable DSL will compete with the much-ballyhooed cable modem the cable TV companies want to offer for Internet connections.

A cable modem works very differently from a phone line. Instead of using a dedicated connection, all the cable subscribers in a region will share an Internet feed, occupying the equivalent of one cable television channel. Each data packet will contain a user ID, and your cable modem will pick out only those packets addressed to you.

The system resembles a local area network, and many proposed cable modems use an Ethernet-like protocol. A major drawback is that today's cables can carry only downstream data; for upstream data, you'll have to tie up a phone line, or the companies will have to build a wireless radio network.

Bandwidth Not Enough Although cable companies talk about 500-Kbps to 5-Mbps or even faster connections, each cable modem subscriber will get only a fraction of that bandwidth. When fewer users are logged on, more bandwidth may be available.

But a faster final link doesn't always mean faster performance. Data speeds—whether for DSL service or for cable modem—describe only the last downstream link to your computer. Actual data

Comparing Data-Transfer Speeds

Data speeds for present and forthcoming connections, in kilobits per second.

**Speed of cable modem depends on the cable system and the number of users served at any given time.*

speed depends on many other factors, such as the servers and intermediate links.

DSL, like your phone service, lets you switch between different providers. But since cable modems—like cable television—work only with data fed by the local cable company, they can't offer that option. Cable companies can't provide true switched operation or upstream connection without replacing their present cables and electronics, a process that would take many years, if it is ever done.

US West, one of the regional Bell companies, says it will provide DSL service in some cities next year and that by 1998 DSL will be widely available, with rates starting at about $35 per month for metered service. But because it needs high-quality, relatively short wire runs, DSL won't be available in all areas; it cannot reach as far as ISDN.

DSL Has the Edge Don't expect the cable TV companies to settle on a standard cable modem format in less than two years, because no one knows what will work with today's myriad cable systems. Therefore, many companies are likely to use interim formats that may quickly vanish once a standard finally emerges.

For now, the phone companies appear better situated, since they can offer limited DSL services without rebuilding their networks, though widespread use of DSL will require newer switching equipment. Cable companies face greater obstacles, because their systems aren't designed for two-way transfer, and data customers are much more demanding than TV viewers.

The 6-Mbps data rates later versions of ASDL promise should meet most users' needs for some years to come. Then we'll stop complaining about slow modems and find other bottlenecks to gripe about.

publishing

Portable Docs Get a New Lease on Life

THE NEW MISSION: CONTENT ON THE NET

by James A. Martin

Send a formatted electronic document to anyone anywhere and save untold dollars in network resources and storage—even reduce global warming.

At least, that's how portable-document programs such as Adobe Acrobat (415/962-4400, *http://www.adobe.com*) were touted in the early 1990s—only to fade from lack of interest. But with the explosion of the Internet—and its cousin, the corporate intranet—there's finally a strong argument for portable-document technology.

Most vendors are poised to seize the Internet opportunity, but for some it might be too late. Here's where the four portable-document products stand today.

Acrobat Takes the Lead Thanks to marketing and name recognition, Acrobat has made it through relatively unscathed, and now seems to be the dominant portable-document technology for Web content developers.

The new version, 3.0, lets you view PDF files (Acrobat's native format) within Netscape Navigator 2.0 and Microsoft Internet Explorer. Previously, you had to download a PDF file from a Web site, then launch Acrobat to read it. With 3.0, you merely click on a PDF file to download it within the browser's

continues

Media WATCH

BY JIM FEELEY

Real-Time Video Effects

Two hardware developers, Truevision and Scitex Digital Video, have jumped into the waters of dual-stream video, promising real-time creation of dissolves, wipes, and other transition effects. Most single-stream video systems make you wait for such effects to render.

Truevision (408/562-4200, *http://www.truevision.com*) has stuck two hardware codec chips on its Targa 2000 RTX, letting the PCI card play two streams of component 720-by-486-pixel video. Avid, Adobe, and others plan to support the $13,995 card.

The ImMix Sphere systems from Scitex Digital Video (410/783-0600, *http://www.scitexdv.com*) combine custom video-editing software with an outboard RISC-based processor unit that creates 720-by-486-pixel QuickTime Motion-JPEG images and effects in real time. Multiple Macs can share the video processor, which provides both component and serial digital-video I/O. Sphere systems cost $13,995 to $69,000.

Smart Move: "Dumb" Audio

Apple's consumer audio ports and analog-to-digital converters limit the built-in audio-processing power of every Power Mac. So Korg (516/333-9100) built the euphoniously named 1212I/O PCI Multi-Channel Audio Interface with Deck II. The $1250 PCI card holds no DSP chips but combines analog and S/PDIF I/O ports with an eight-channel ADAT connector, providing the missing link between high-quality audio source and the Power Mac's audio-processing muscle.

The ADAT connector links your Mac to tape decks and peripherals that use the ubiquitous audio port developed by Alesis. As you've probably guessed by the name, Korg bundles a copy of Macromedia's Deck II audio-editing software. Optional A/D and D/A hardware interfaces are available.

LightWave Coming to Mac

LightWave 3D, one of the most popular 3-D packages on any platform, will finally be available for the Power Mac in the third quarter of this year. NewTek (913/228-8000, *http://www.newtek.com*) says the $1495 program will support QuickDraw 3D's interactive renderer, and will be feature-equivalent with upcoming 5.0 versions of LightWave running on PCs and Silicon Graphics workstations.

DOUG ROSS

window, one page at a time.

Acrobat 3.0 lets you add interactive data fields to PDF documents. Developers of Web sites can capture data from users and then archive the completed form as a PDF file, which will produce better output than is possible in HTML format.

An OCR plug-in lets you scan documents and graphics to generate PDF files for archiving or distributing. At press time, pricing for Acrobat 3.0, due to ship in August, wasn't final.

Previously existing features include Catalog, which creates search indexes to find content from a repository of PDF files, and hyperlinking tools that allow annotation and links to other documents and Web sites. And in an effort to reduce the large file sizes of previous versions, 3.0 will use compressed Type 1 fonts and LZW file compression.

Losing Ground Once considered a strong contender, Common Ground from Common Ground Software (formerly known as No Hands Software, 415/802-5800) has seen its edge slip away. Version 2.0 is finally set to ship this June for $189, nearly two years after it was announced. In the interim, many of 2.0's enhancements—like support for Netscape Navigator and Internet Explorer—have been added to other programs, such as Acrobat and Tumbleweed Software's (415/363-7022, *http://www.twcorp.com*) Envoy.

Also like Envoy, Common Ground 2.0 will incorporate Bitstream's TrueDoc font-replication technology. Embedding TrueDoc font outlines in a document creates smaller files and provides unlimited magnification and output without loss of resolution, the company says.

Still a Contender Of all the portable-document programs, Envoy has traveled the most twisted route. Developed by Tumbleweed Software, it was licensed to WordPerfect. When Novell acquired WordPerfect, it incorporated Envoy into its suite of office software—which it then sold to Corel. Today, Corel is licensing Envoy with its Corel Office suite for Windows and with both versions of WordPerfect.

Meanwhile, Tumbleweed sells Envoy for $79 exclusively from its Web site. Envoy is also part of Tumbleweed's $199 Publisher package, which batch-converts PostScript files into Envoy format. And it's in the $695 Publishing Essentials, which offers search-index tools like Acrobat Catalog's, as well as batch conversion of PostScript files.

Envoy 7.0's viewer is more robust than its competitors', letting you easily create indexed documents with annotations, tables of contents, links to other Envoy documents and to Web sites. The program's ability to embed Envoy files in many applications, including some E-mail packages, and its fairly compact file sizes have earned it a loyal following.

The End of the Line The least promising of all, Farallon Computing's (510/814-5100, *http://www.farallon.com*) $99 Replica is still in its first version, and there are no upgrade plans. Farallon is positioning it for CD-ROM and other developers, but considering its competitors' stronger CD-ROM production features, it's hard to see any future for Replica.

Internet WATCH

BY CAMERON CROTTY

Mac Java Pot Bubbles

Java remains on everyone's lips in and out of the coffee shops on the Rue du Macintosh. The biggest news about the piping-hot object-oriented programming environment was Apple's (408/996-1010, *http://www.info.apple.com*) recent announcement that it would license Java from Sun Microsystems and make it an integral part of both the Macintosh and the Newton operating systems.

Meanwhile, PowerProduction Software (310/937-4411, *http://www.powerproduction.com*) announced WebBurst, a graphical Java authoring tool, expected to ship by June for $299. Users can import images or animations into WebBurst and graphically assign animation paths and hot links. WebBurst also has tools for interface construction—you can design buttons and text fields, and then program their behavior. When you're done, WebBurst creates a folder that contains the Java code and supporting files.

Java applets grow graphically when you use WebBurst, a visual application builder.

Moving into the server domain, Quarterdeck (310/309-3700, *http://www.quarterdeck.com*) has announced a partnership with Natural Intelligence (617/876-4876, *http://www.natural.com*), the company that developed the Roaster Java development tool. Natural Intelligence is developing a Java virtual machine plug-in for Quarterdeck's WebStar Web server. The companies expect to deliver products incorporating each other's technologies by the end of summer.

Browsers Do the Walking

Now that you're online, software is on the way for cruising and downloading all those Web sites that you don't have time to follow. They're called offline browsers, and the first Mac candidate, WebBuddy, is expected to ship in July for $49 from DataViz (203/268-0300, *http://www.dataviz.com*). When you find a site you want to read, but don't want to wait while it downloads, a click on WebBuddy's Page To Go or Site To Go button will schedule a time to download one or more pages for your later perusal. Other companies are working on similar utilities, including FreeLoader (202/686-0660, *http://www.freeloader.com*), whose eponymous FreeLoader software watches sites you've subscribed to. When FreeLoader is available for the Mac (not until this fall), it will include a screen saver to alert you to new information.

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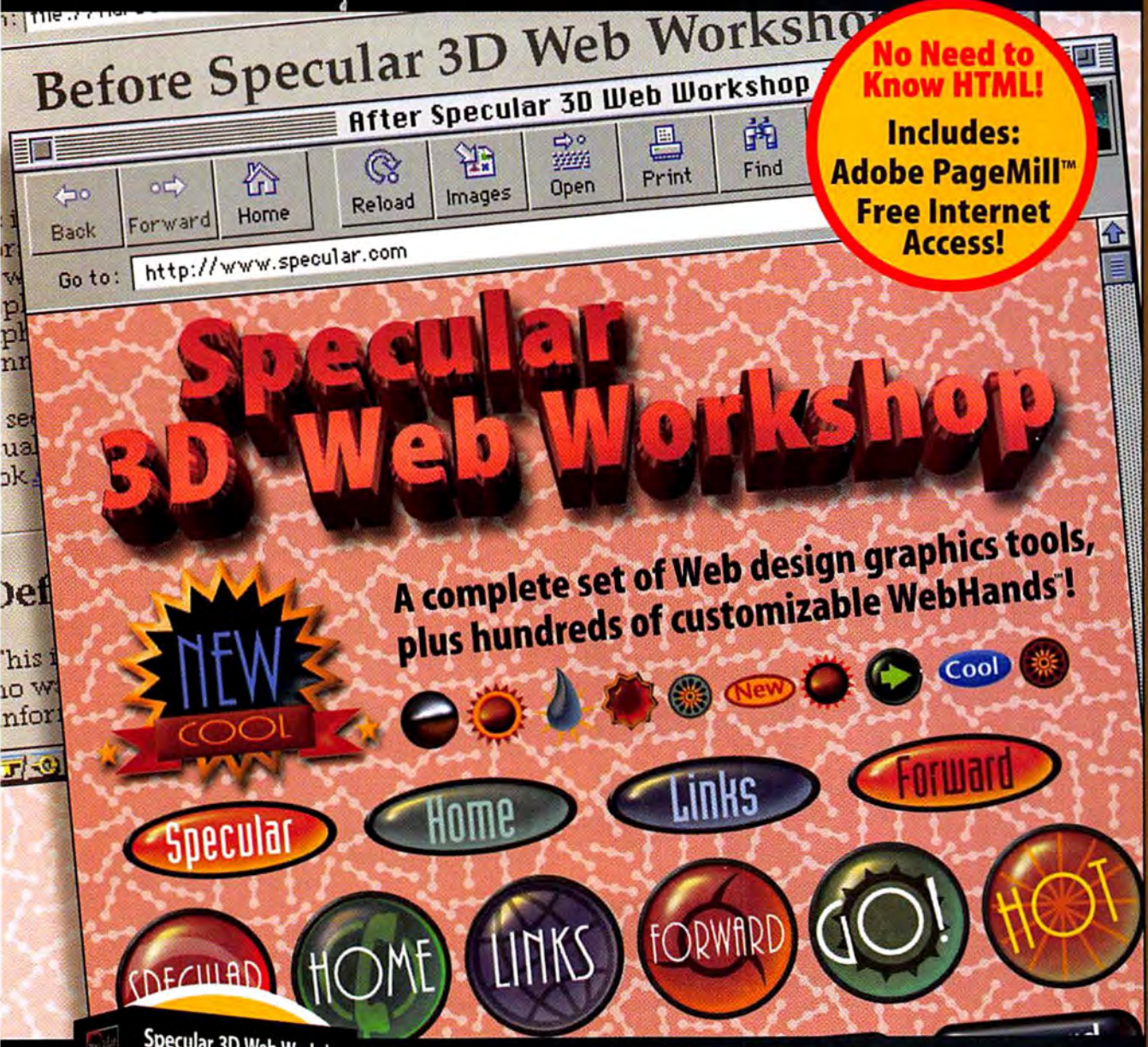

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New Tools for Content Creation

A FIRST LOOK AT QUARKIMMEDIA, NAVIGATOR GOLD, AND CORELDRAW

Creating sophisticated imagery has always been a priority for Macintosh users, but the recent Web publishing explosion has upped the ante. Here's a quick take on Quark's XTension for Web and multimedia production, Netscape's HTML editor, and Corel's all-purpose graphics package.

Immedia Makes QuarkXPress Interactive

by Barbara Assadi

Everyone's jumping on the Web publishing bandwagon, many with tools that create HTML documents based on existing documents. But Quark (303/894-8888, *http://www.quark.com*) is following a different path. The company's first foray into cyberterritory is the $995 QuarkImmedia, a multimedia- and Internet-authoring and viewing extension to QuarkXPress that should ship this summer. I spent a day with a beta copy of QuarkImmedia and was impressed by the depth of its features.

Layout Comes Alive

Immedia has two parts: the design (authoring) tool and the viewer. With the design tool you can add QuickTime movies, sounds, buttons, and animations to your XPress layouts—for use on the Web, CDs, or internal corporate networks. In fact, you can transform your layout into a presentation that is truly interactive, not merely a gussied-up layout.

The feature set is rich and complex, but not overwhelming—I was able to create a simple project in just a few hours. As an extension to QuarkXPress, Immedia approaches multimedia projects with a page-based metaphor that XPress users will adapt to easily. The look and feel is vintage XPress, with the addition of tabbed windows that control the objects (text boxes, picture boxes, lines, or text strings), user events (such as clicking on a certain spot), and actions (more than 100 scriptable actions, such as those that start or stop a QuickTime movie). An Engage command in the design tool makes it easy to test and preview projects as you develop them. Unfortunately, while XPress supports Apple-events scripting, Immedia currently does not.

With well-designed and powerful tools, QuarkImmedia lets you create interactive QuarkXPress documents with sound, motion, and buttons.

While those familiar with XPress should have no trouble adapting to Immedia, others may find having to first learn (and buy) XPress a bit intimidating. Immedia will require XPress 3.2 or later. On the plus side, Immedia comes with superb, easy-to-follow documentation, with a tutorial that walks you through the creation of a fairly complex project. A separate booklet includes an overview of everything you need to consider when planning a project.

What's missing is an effective way to get a bird's-eye view of your project—such as in Macromedia's flowchart in Authorware or spreadsheet in Director—but since Immedia sports the same open architecture as XPress that lets other companies write plug-ins (XTensions) to Immedia, I hope a plug-in developer will rise to the occasion.

This product should be a hit with publishers who have archives of interesting XPress pages, since they will now be able to turn those pages into interactive projects. Publishers will also be able to create dual-purpose pieces (for print and online use, for example).

Beyond HTML

Quark has been criticized for not supporting HTML in Immedia. But the company's goal has been to create a tool that allows users to produce projects that look better than what the admittedly primitive HTML standard can deliver. Based on the beta version, Immedia seems to come through on that goal.

What remains to be seen is how widely used Immedia will become, and in what media. I suspect it may compete more with authoring tools like Macromedia Director and Gold Disk Astound than with Web publishing tools like Adobe PageMill or Adobe Acrobat.

Navigator Gold 3.0 Does HTML

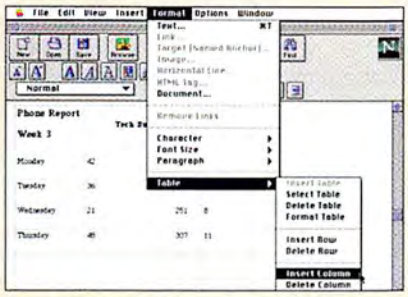
by Geoff Duncan

Following recent practice, Netscape Communications (415/937-2555, *http://www.netscape.com*) has been making preview releases of both Netscape Navigator 3.0 and the "premium" Netscape Navigator Gold 3.0 publicly available. Navigator 3.0 is a RAM-hungry update to Netscape's popular Web browser with a revised look and enhanced media, chatting, VRML, and Java support. Navigator Gold 3.0 will offer the same Web browser, and enhancements plus built-in WYSIWYG HTML authoring tools for creating Web pages. With Navigator Gold, Netscape has a good start on a combined browser and authoring program that could prove useful for casual and first-time Web authors.

More Than Meets the Eye

Navigator Gold's HTML editor resembles Microsoft's Office applications, which (of course) resemble Microsoft Windows. The basic idea is to enter or import text, then set it

up to be viewed on the Web. Netscape Gold's HTML editor offers tool bars for file operations, character attributes, and document formatting, along with menu commands and dialogs to create and modify Web documents without resorting to HTML coding.



If you're used to making tables in a word processor, you'll feel right at home with Navigator Gold's table editor.

Some of the tool-bar items are genuinely useful, such as the style pop-up and list-making buttons; the (often multitabbed) dialogs offer surprisingly complete control of the page, including images, character and paragraph styles, and links. For many users, the most significant benefit of Navigator Gold's HTML editor will be its tools for creating and editing HTML tables, which are notoriously difficult to code by hand. Those with experience creating tables in word processing programs will find Navigator Gold's table editor full-featured and easy to use.

Near-WYSIWYG Editing

Those unfamiliar with (or intimidated by) HTML tags will immediately understand the appeal of Navigator Gold's nearly WYSIWYG HTML-editing features, and though the editor's display isn't the same as a browser, it does give a good approximation. But because it makes no effort to distinguish Netscape's nonstandard HTML extensions from "standard" HTML, it's difficult to determine whether a feature will translate well to the wide range of Web browsers in use. This means that making Web pages that work with a variety of browsers will still require knowledge of HTML tags. Also, Navigator Gold's HTML editor transparently converts common international characters to HTML entities, but it doesn't convert common desktop publishing characters, such as em dashes and curly quotes, into cross-platform equivalents.

Needs and Speed

Navigator Gold's biggest problems are performance (it's possible to type faster than the editor can handle, even on a high-end Power Mac), and interface gaffes (setting up a link requires manually typing or pasting in an URL, since the HTML editor and its dialogs don't yet support drag and drop from other applications or from Netscape windows). Still, Navigator Gold is a promising start that might give PageMill 2.0 serious competition, provided it can run in a reasonable amount of RAM.

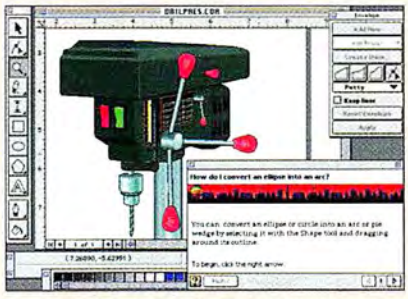
Can CorelDraw Challenge the Pros?

by Mike Heck

For many years, CorelDraw (613/728-8200, *http://www.corel.com*) has owned the Windows illustration market, but Mac users are a different breed. The long-overdue Mac version faces stiff opposition from professional users of Macromedia FreeHand and Adobe Illustrator, who'll need strong convincing to even consider a switch.

After evaluating a beta of CorelDraw 6 for the Power Mac, I would expect novice Mac artists to seriously consider this product because it's easier to understand and use than its main competition, Illustrator and FreeHand. Experienced illustrators should also appreciate its professional-level capabilities, such as color matching, and its cross-platform compatibility is a plus for those who work with both Macs and PCs.

CorelDraw 6 is a great value because with it you get not only the flagship draw program, but also a procedural texture generator (CorelTexture), a 3-D modeler (CorelDream), and a bitmap editor (CorelImpressionist).



CorelDraw 6 clusters related tools in roll-up palettes, which are more intuitive than the toolboxes in either FreeHand or Illustrator. And, true to the Macintosh interface, CorelDraw supports Apple Guide help.

CorelDraw logically groups functions, such as special effects, within roll-up palettes so they're easy to find. Illustration tools—polygon, spiral, knife, and eraser—match the capabilities of similar functions included with the latest releases of Illustrator and FreeHand. Yet CorelDraw's bitmap fills and infinitely variable texture fills give you far more artistic freedom. For example, you might fill an object with a textured paper pattern, with options to change the paper's color and fibers any time during the design process.

Even with its 100 editable textures, CorelTexture isn't as full-featured as Specular International's TextureScape, since you can't create objects and apply textures to them in the same module. Even so, CorelTexture is worthwhile because it provides a wider range of controls than TextureScape, which results in more-realistic-looking textures. You can combine up to seven surface layers to build a texture, then adjust settings such as color, lighting, grain angles, and how the layers interact.

Although CorelImpressionist has some unique features—such as the ability to define the dry-out speed and wetness for the artistic brush effects, and to directly edit text after it's placed within an image—it won't challenge Photoshop's stranglehold on the image-editing market or Fractal Design Painter's natural-media-effects domain.

Finally, CorelDream 3D is just a Corel-specific version of the popular spline-based modeler Ray Dream Designer (now owned by Fractal Design).

CorelDraw, like any illustration package, reflects a working style more than a right or wrong software-design approach. Macintosh artists should give Corel credit for including a long list of professional capabilities, like 32-bit precision and PostScript output options. About the only missing piece is high-fidelity (hexachrome) color matching, which Corel is planning for a fall release in CorelDraw 7.

CorelDraw 6 for the Power Mac is planned for a July release at a list price of $695.

systems

Truly Personal Computers

SPECIAL-PURPOSE PDAS WILL HANDLE INTERNET, PHONE, AND E-MAIL

by Galen Gruman

For years Apple and others have been promising computers that are as personal as Walkmans. In recent months, the promise has been for Internet appliances—stripped-down PCs, costing less than $500, to surf the Web. Apple's Pippin technology offers a similar promise, but will be more expensive—about $650 (see "Bandai's Pippin Arrives," *News*, May 1996). Now a new company, composed of engineers from Oracle, the database giant, has a new promise: the Interactive Digital Appliance. Diba (415/596-1177, *http://www.diba.com*) promises the first appliances by the end of the year, and says they will include a device that connects to the Internet (shown here) and can handle both phone and E-mail. The company says the systems will cost between $300 and $400 each.

Unlike a computer, the Interactive Digital Appliance will have no keyboard—Diba Internet will use an infrared remote to control it, while Diba Mail will use a standard phone handset. While they're not Mac-based, the Diba devices—essentially special-purpose PDAs—will use some Mac technology. Most prominent is Quark's plan to port its QuarkImmedia multimedia playback software to some Diba devices, for use in displaying interactive Web pages and CD-ROM data.

KEVIN CANDLAND

Diba Internet surfs the Web with an infrared remote control instead of a keyboard.

"MAC CAD DOES FINE"

continued from page 39

Macs comparable in throughput with last year's Silicon Graphics or Sun workstations, CAD software for the Mac is entering a new experimental phase.

Bentley Systems (610/458-5000, *http://www.bentley.com*), developer of the top-of-the-line cross-platform system MicroStation V5, has sped up its Mac efforts lately to avoid "Mac lag" on Windows titles. The company's new architectural 3-D modeler, TriForma, was recently released on multiple platforms simultaneously.

Yoav Etiel, president of Bentley, notes, "People design every aspect of buildings with our software, and the buildings will last 50 to 100 years. Someday people will have to modify those designs, in an era where only software old-timers even remember what the Mac OS or Windows 95 were. We have to be committed to fully supporting every viable platform, now and in the future."

Gone, but Not Forgotten

Ashlar (408/746-1800, *http://www.ashlar.com*) product manager Jesse Lewis notes that Ashlar dropped the price of its longtime flagship Mac favorite, Vellum, from $2995 to $1495; introduced a lower-cost ($695) upgrade program for Claris CAD refugees; and is aggressively working on converting AutoCAD sites.

In fact, now that AutoDesk is no longer a competitor, Ashlar is licensing some of its interface and geometric transformation technology to AutoDesk for inclusion in future PC AutoCAD versions. Ironically, though, AutoDesk remains a powerful but ghostly presence in the Mac market, as the ability to read and write AutoCAD file formats is a must-have feature for any CAD software.

It's never good news when an important vendor stops Mac support, but the special circumstances of the Mac CAD market seem to mean that AutoCAD's absence is not particularly bad news, either. As Ashlar's Lewis points out, "If your program can read and write current and earlier AutoCAD file formats, and you can compete with AutoCAD on features and beat it at ease of use, you can have a very good time in business as a Mac CAD vendor."

System 7.5.3's Speed Advantage

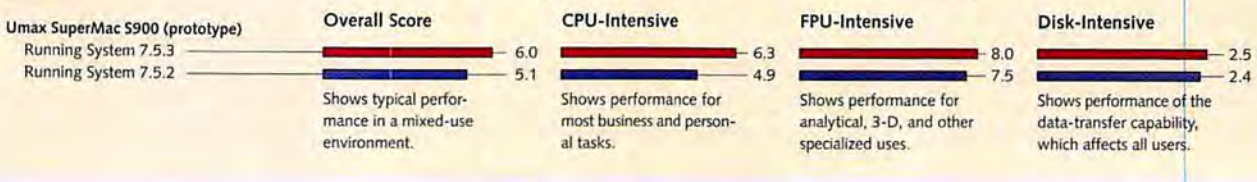
APPLE TAKES BETTER ADVANTAGE OF THE POWERPC

Apple's recent System 7.5.3 update delivers a substantial performance boost over the previous system software. A prototype of the Umax SuperMac S900, for example, gained about 18 percent in overall performance, as can be seen in the performance figures we obtained, which are shown below. Other vendors' machines experienced similar improvements, particularly in the CPU-intensive and FPU-intensive tasks (as demonstrated by the Umax unit).

The speed increases result in part from a larger percentage of the new system code having been rewritten as native for PowerPC. Apple also made a number of other improvements, including changes to QuickDraw routines that speed up QuickDraw-related functions.—MARK HURLOW

MW LAB

Best result in test. Longer bars are better. Results are times as fast as a Centris 650 (Centris 650 = 1.0).
For test details, see "The New Speed Champs," July 1996 issue.—**Macworld Lab testing supervised by Mark Hurlow**



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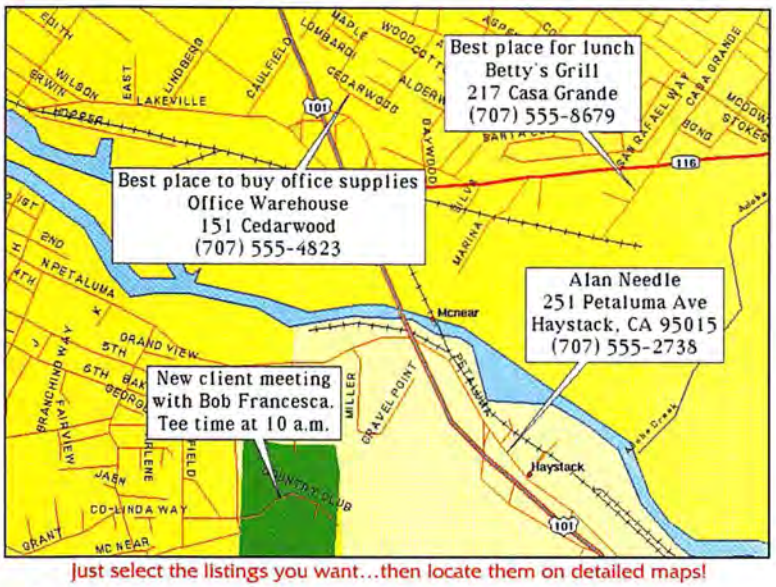

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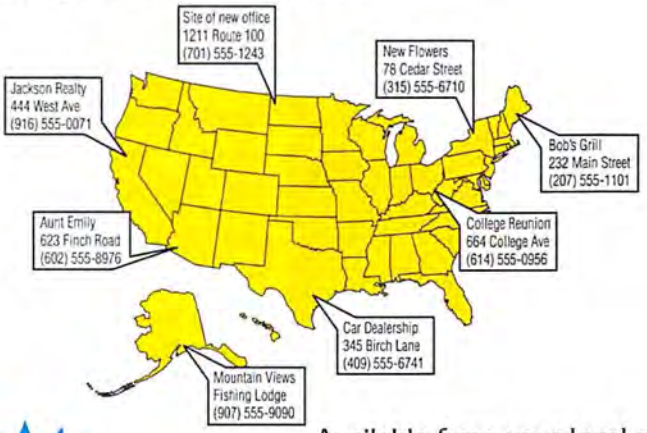

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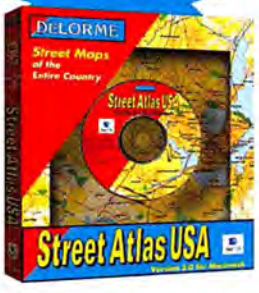

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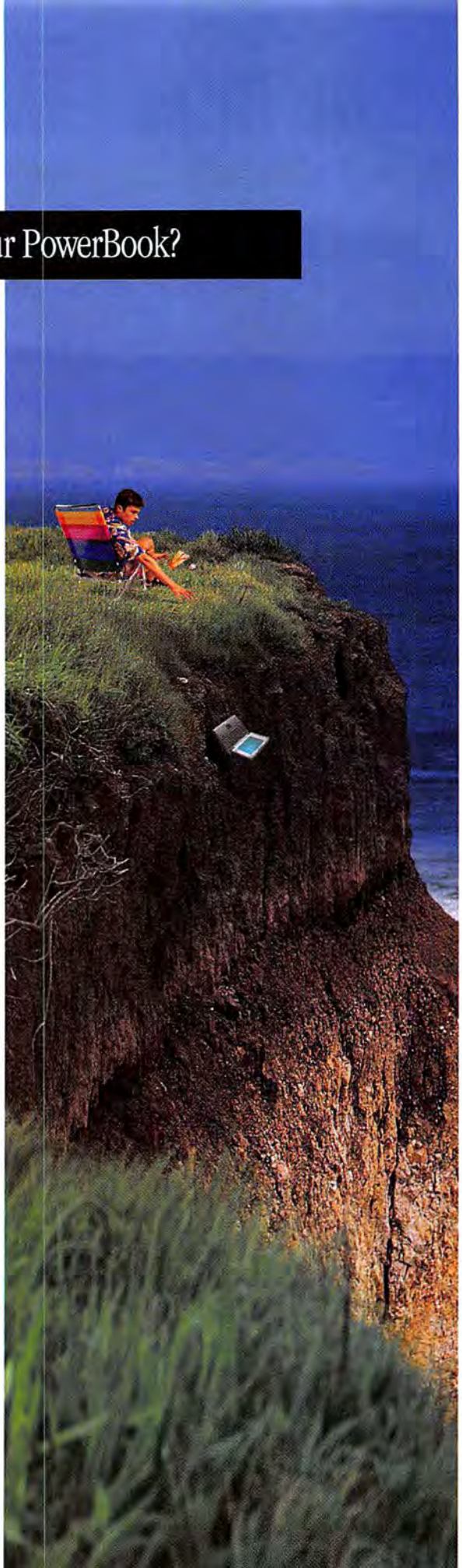
New for Macintosh!

DELORME

Check out our Web site! www.delorme.com

Circle 86 on reader service card

What *was* on your PowerBook?



Amazing where you'll find PowerBooks these days. On the road. In the air. At the beach. Everywhere.

Only thing is, they're traveling around with important files that don't exist anywhere else. And every disaster that can happen to a Mac in the office is multiplied when you take a PowerBook into the world. Like cocktails in the keyboard. Or when it gets hijacked at the airport. Voltage spikes. Gorilla bellhops. The unfortunate farewell when you leave it behind in a cab.

With Retrospect Remote® 3.0, PowerBooks get the protection they need. It backs up PowerBooks automatically when they connect to the network. So even when your PowerBook's not connected, you still have peace of mind.

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MacWEEK
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Circle 26 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

BUSINESS

Adding HTML to Business

If you want to publish your business's data on the Web, but your authoring skills run more to Persuasion than to PageMill, some business-oriented software tools are adding Web-publishing features.

One of the latest is RadMedia's (415/617-9430, *http://www.radmedia.com*) $495 PowerMedia multimedia authoring software, which features simple tools and templates designed for business users creating interactive hyperlinked presentations. PowerMedia presentations can be viewed with RadMedia's run-time software (also available as a Netscape Navigator plug-in), or they can be published as HTML documents.

COMMUNICATIONS

Cross-Platform File Transfer

Macintosh users trying to transfer files to and from Windows machines have an alternative to faxes, E-mail, and overnight delivery: the $30 GlobalTransfer from Global Village (408/523-1000, *http://www.globalvillage.com*).

Based on the Zmodem file-transfer protocol and compatible with most 14.4-Kbps or faster modems, GlobalTransfer lets you send documents cross-platform using a simple point-and-click interface. It eliminates the hassles of fax software and the file-encoding and compression requirements of E-mail.

EDUCATION

Colorful Crafts on an Ink-Jet

With its everything-you-need-is-in-the-box project kits, PrintPaks (503/295-6564, *http://www.printpaks.com*) lets you go beyond the ordinary with your ink-jet printer. PrintPaks Magnet Kit, Pop-Up Greeting Card Kit, Personalized Pinwheel Kit, and Window Art Kit each include a CD with step-by-step instructions, high-quality papers and components, and supplied art—although you can use your own. You can find PrintPaks for about $20 each in places like Target, Toys 'R' Us, and craft stores, in addition to regular computer chains. Refills are available from PrintPaks for $10.

GRAPHICS

Better Art through Chemistry

Despite the many collections of background images to be found on CD-ROM these days, here's one you probably haven't seen. PhotoGear Texturework from Image Club (403/262-8008, *http://www.imageclub.com*) features 30 irregularly textured high-resolution images, all created by mixing acrylic paints with ordinary soap. It is available now for $59.

Low-Cost Digital Photography

As image quality improves, the cost of digital cameras continues to drop, and Epson's (310/782-0770, *http://www.epson.com*) PhotoPC for Mac is no exception. With the look and feel of a traditional 35mm camera, the PhotoPC weighs less than a pound, provides 24-bit color in up to 640-by-480-pixel resolution, and compresses images in JPEG format. The base unit's 1MB of flash memory stores up to 16 high-resolution images or at least 32 standard images, and is expandable to 5MB for up to 160 standard-resolution images. The PhotoPC accepts any 37mm video camcorder lens or filter and has auto- and forced-flash modes. Due this summer, the PhotoPC lists for $599.

Epson's PhotoPC for Mac

Designs from Ancient Times

One of the most influential books on ornamental design is now available on CD-ROM from Direct Imagination (818/793-8387). Owen Jones's *Grammar of Ornament*, first published in 1856, in this version contains more than 2300 royalty-free patterns from 20 cultures and epochs throughout history, including Egyptian, Greek, medieval, Renaissance, Byzantine, Persian, and Chinese. Also included is a collection of 160 patterns from the book, redrawn in PostScript, that can be scaled to any size without loss of quality. Acrobat browsers let you easily navigate through the *Grammar* text and the color plates. The Professional Artists' Edition is $199; the Compact Edition, $99; and the Art Resource Edition, $59.

Grammar of Ornament

Black-and-White Hits the Spot

Color may be hot, but sometimes black-and-white says it all. If you're looking for striking illustrations in shades of gray, now there's a stock image agency for you. Spots on the Spot (914/426-5759) lets designers tap into an electronic library of more than 6000 images by 80 professional illustrators, with cost of usage ranging from $65 to $125 per image. It also has an automated 24-hour fax-on-demand network. Expect to see a CD-ROM version by the fall.

MULTIMEDIA

ElectricImage Broadcasts Effects

Artists who create 3-D graphics for television broadcasts, CD-ROM titles, and other media can now take advantage of the same software tools used to produce special effects for films such as *Terminator 2*. The $2495 ElectricImage Broadcast from ElectricImage (818/577-1627, *http://www.electricimage.com*) contains most features found in the $7495 ElectricImage Animation System, except that rendering is limited to broadcast resolutions of up to PAL (768 by 576 pixels).

Real-Time Digital Video

In the jump-cut world of digital video, click-and-wait leaves you dead in the water. With Truevision's (408/562-4200, *http://www.truevision.com*) $4995 Targa 2000 RTX hardware-based editing package, video artists can process digital-video effects, such as wipes, fades, and dissolves, in real time.

NETWORKING

Connect 10BaseT to 100BaseT

Migrating to 100BaseT? Asanté (408/435-8388, *http://www.asante.com*) can help with its $7499 71010xp 10/100 Switch, an eight-port 10BaseT/100BaseT workgroup switch that should be shipping by the time you read this; it includes two expansion (TX or FX) ports. Asanté has also released the $2495 ReadySwitch 5104 FX, a 10BaseT switched hub with a 100BaseFX fiber-optic link.

Dayna Communications (801/269-7200, *http://www.dayna.com*) has released a single-port bridge, the $499 BlueStreak Fast EtherPrint 10/100, which connects 10BaseT-only devices (such as most network printers) to a 100BaseT network.

Full DNS for Mac

Iceland-based Men & Mice (354/525-4938, *http://www.menandmice.com*) has released QuickDNS Pro

continues

New Products

1.1, a $295 domain-name server that offers primary, secondary, and recursive name service.

ONLINE

3-D on the Web

Targeted at Web-page designers who want to build 3-D imagery, animation, and graphic elements into their Web sites, Specular's (413/253-3100, *http://www.specular.com*) 3-D Web Workshop (price not yet announced) is a 3-D Web-page design and layout package composed of Specular TextureScape, Specular LogoMotion, Adobe PageMill, and Specular WebHands, a collection of customizable graphic elements for Web-page design.

New Life for Old Macs

Don't throw out that old Mac LC II—turn it into an Internet router instead. Vicom (800/818-4266, *http://www.vicomtech.com*) has released the Vicom Internet Gateway for the Small Office, a software TCP/IP router that works on any Mac with a 68020 or better processor running System 7. Multiple users on Ethernet or AppleTalk LANs can access the Internet simultaneously through a single SLIP or PPP account via modem or ISDN. A 2-user version is $149; $50 for 1 additional user; $300 for 10 users; $500 for 20; ISDN module $149.

Measure Your Bandwidth

Are you finding that your T1 line isn't quite as fast as you expected? Neon Software's (510/283-9771, *http://www.neon.com*) $139 Cybergauge is an SNMP management tool for determining your Internet requirements and learning whether your bandwidth matches up. It works on all IP/SNMP-capable devices—including routers and hubs—to measure bandwidth use, pinpointing bottlenecks and misconfigurations to help you improve efficiency. Special pricing is available for current Neon Software customers.

PRINTING

The Right Size

Trying to get your output to fit on your printer's pages? Try Great Proportions, a $27 electronic version of the venerable proportion wheel from SGE Software (516/424-7925).

PUBLISHING

Remote Image Management

Alaras (919/544-1228) has added Client and Remote modules to its image-management and workflow-automation system. Alaras Tropix Client (prices range from $90 for 4 users to $5990 for 25 users) adds password-protected network accessibility to the Server module. With the $290 Alaras Tropix Remote, customers of service bureaus can dial in via high-speed modems, ISDN, or T1 connections to a centralized password-protected image database. To offer high-speed remote access, the service bureau needs

Alaras's Tropix

the $15,000 Alaras Server Pro module, which will also be able to accommodate future modules such as Time Billing and Auto Changer (for jukebox support).

SCIENCE/ENGINEERING

Word Does Math

If you're working on a technical report and tired of switching from Microsoft Word 6.0 to Wolfram's Mathematica for your calculations and equation generation, look to Mathematica Link for Microsoft Word, a $129 utility from Wolfram Research (217/398-0700, *http://www.wolfram.com*) that lets you access Mathematica directly from within Word 6.0.

STORAGE

MO Drive Twice as Fast

Current magneto-optical drives handle data in a two-pass process: the drive erases the previous data, spins around again, and then writes data. Nikon's (415/508-4674) new Beluga 5.25-inch, 2.6GB, MO drive ($2699 for an internal model) skips the erasure step and overwrites previous data, much in the same way a tape system or hard drive does.

Nikon's Beluga

The Beluga drive can read data that's already been written onto current 650MB and 1.3GB MO media from other MO drives. However, once the media has been used in a Beluga drive, the media cannot then be read by non-Beluga drives. Beluga media will cost about $160 for a 2.6GB cartridge.

Tape and RAID Make Room

Many of us are just reaching a gigabyte of storage on our desktop machines, but in the worlds of networked backup and digital video, 1GB is just the beginning.

Procom Technology's (714/852-1000, *http://www.procom.com*) new $12,995 LDLT280G digital linear tape subsystem provides up to 280GB of compressed storage for extensive networking environments. It accommodates seven DLT drives, and Procom estimates that the library's robotics can load and unload tapes in about 29 seconds and locate data in about 68 seconds once a tape has been loaded.

TITLES

New Angles on the Net

While much of the hoopla about the Internet centers on how to browse or publish your Web pages, two books explore this phenomenon from fresh angles.

- *Digital Money*, a $25 book by Daniel Lynch and Leslie Lundquist (John Wiley & Sons, 212/850-6000, *http://www.wiley.com/compbooks*), explores the processes and issues behind online commerce.
- *Bandits on the Information Superhighway*, an $18 book by Dan Barrett (O'Reilly & Associates, 707/829-0515), is a course in information-superhighway street smarts, dealing with the hype and realities of online pornography, crime, commerce, pranks, junk mail, privacy, and relationships.

Preparing Web Graphics

Covering the visual side of the Internet, *Designing Web Graphics*, by Lynda Weinman, is a $50 book with CD-ROM published by New Riders (317/581-3500, *http://www.mcp.com/newriders/*) that uses step-by-step tutorials and real-world examples to show how you prepare effective graphics for the Web.

UTILITIES/TOOLS

More Favorite Shortcuts

CE Software (515/221-1801, *http://www.cesoft.com*) has released version 3.5 of QuicKeys, with a Power Mac version to come in August. QuicKeys 3.5 ($119) offers new ways to create shortcuts within or across applications—including using stationary tool bars and floating palettes. Version 3.5 includes a batch processor for performing a series of QuicKeys shortcuts on multiple documents, and promises to simplify creating shortcut sequences.

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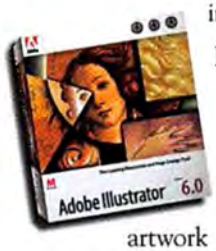
WONDER BOY

Your ability to perform wonders just got a boost. Now the leading illustration and page design program for Macintosh® offers the highest quality TIFF and other file format support of any illustration program. And boy! Look at these killer features. You can drag and drop images from Adobe™ Photoshop™ right into the application; turn your Adobe Illustrator™ artwork into raster images and apply Photoshop™ filters; and edit and colorize 1 bit TIFF images. And you can run a full array of plug-ins for Adobe Illustrator and Photoshop. Now you can even drag and drop the logo you've created into Adobe PageMill™ to start building your web site today. You also get a CD-ROM with 300 Type 1 fonts, Adobe Dimensions™ 2.0, 48 Gallery Effects™ filters, Adobe Screen Ready™, QuickTime™ tips and techniques, and more. Upgrade to the new Adobe Illustrator 6.0. Then turn your own genius loose. Call us at 1-800-521-1976, Ext. L1271 for more information or visit our web site at http://www.adobe.com/.



Adobe

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Circle 252 on reader service card

Reviews

Polaroid PDC-2000

NEW BREED OF CAMERA CREATES IMAGES AS COOL AS ITS HARDWARE

ROBERT PERRY

THE POLAROID PDC-2000 LOOKS like the sort of camera Buck Rogers would own. Festooned with a barrel sight, a topside LCD panel, and scads of differently shaped buttons, this slablike, faintly ribbed digital camera captures the essence of futuristic design. But apart from its strange appearance, it's a skillful piece of work, supplying the best image quality by far of any digital camera priced under $5000.

Squint and Shoot

The PDC-2000 is a point-and-shoot rangefinder device that can automatically focus on objects as close as 10 inches. Like the ubiquitous self-developing Polaroid cameras, the PDC-2000 uses a sonar-type autofocus system. But unlike conventional cameras, which modify focus by moving the lens, the PDC-2000 moves its light-sensitive CCD to one of 60 predefined positions. Polaroid claims this approach enhances the quality and accuracy of the PDC-2000's focus, and judging by my results, I'm inclined to agree. Virtually every picture I took—including close-ups of moving targets—came out crystal clear.

The lens is a fixed f/2.8 11mm wide-angle model, with a field of vision equivalent to a 38mm lens on a standard 35mm camera. The PDC-2000 lacks a built-in zoom, but you can replace the standard lens with a $199 17mm (60mm-equivalent) alternative. The lens attaches and detaches easily enough, but its relatively large size (2 inches long) makes the process inconvenient. I was inclined to move closer to the subject whenever possible.

The PDC-2000's controls let you adjust white balance, compensate for backlighting, and deactivate autofocus for shots through windows or around foreground objects. Each function has its own uniquely styled button, and the PDC-2000 remembers your settings from one session to the next—distinct advantages over less-expensive digital cameras.

The PDC-2000's biggest disadvantage is its viewfinder, which is nearly as exasperating to use as a high-powered telescope's. Moving the camera the slightest fraction of an inch relative to your line of sight can result in your seeing absolute blackness, and you frequently find yourself looking at nothing more than your own eyelashes. It takes some effort to conform to the viewfinder's vexatious demands, but with practice you can frame your pictures accurately.

RATINGS | Outstanding ★★★★★ = 9.0–10.0 | Very Good ★★★★ = 7.0–8.9 | Good ★★★ = 5.0–6.9 | Flawed ★★ = 3.0–4.9 | Unacceptable ★ = 0–2.9

Fuss and Flash

The PDC-2000's communication skills leave something to be desired. When you frame a picture, the camera often beeps and displays a red light. This can mean the camera doesn't detect sufficient light, or that it has to charge the flash before the next shot. After you snap the picture, a light inside the viewfinder turns yellow, but that's the only indication a picture is being taken. Since each photo takes 7 to 12 seconds to process, you can spend a fair amount of time squinting inside the viewfinder to make sure your picture took.

Although I resent the 10 to 20 seconds the flash spends charging, I appreciate the results. This is a terrific flash for a point-and-shoot camera. It automatically provides full, fill, or ambient flash. Where the flash on most automatic cameras tends to wash out the subject, the PDC-2000 delivered consistently appropriate lighting, even when shooting close-up.

Fantastic Fill Flash With this snake trying like crazy to escape into the bushes, I had little time to evaluate my light source or select an optimum angle. Fortunately, the PDC-2000 automatically compensated for the waning afternoon sunlight by adding a subtle ambient flash—enough to highlight the near side of the snake without eliminating its shadow. The result is an image rich in contrast and detail, particularly impressive given its limited chromatic range.

The Look of Lossless

A digital camera lives and dies by the quality of its images, and here the PDC-2000 comes through with flying colors. Rather than requiring you to specify the image's resolution when shooting a picture, the camera assigns every photo about a million rectangular pixels. The PDC-2000 carves up and interpolates the rectangular pixels to generate square pixels when you download the images to disk. You can interpolate the images down to 800 by 600 (about 500,000 pixels) or up to 1600 by 1200 (2 million pixels). It's refreshing to be able to evaluate resolution inside the studio—where you have the time and materials to make an informed decision—rather than out in the field.

Because the PDC-2000 eschews lossy compression, the 800-by-600-pixel images look nearly perfect, with excellent detail and true-to-life colors. The artifacts and noisy edges that plague JPEG-compressed photos from less-expensive cameras are altogether absent, so the PDC-2000 is an attractive choice for Web designers. At 1600 by 1200 pixels, the pictures are visibly softer, with slightly gummy edge detail. Even so, they compare favorably with similarly sized Photo CD images, which also tend to be soft.

Polaroid sells its digital camera in three variations. The $3695 PDC-2000/40 that I reviewed offers 40MB of internal storage and holds up to 40 images. The $2995 PDC-2000/T has no internal storage and must be cabled to your computer when shooting pictures. The $4995 PDC-2000/60 includes a solid-state flash drive that holds 60 images, and better endures the bumps and shocks of field work, according to Polaroid. Given the $1300 price difference, the PDC-2000/40 is the better deal.

A Difference in Interpolation The PDC-2000 shoots pictures with elongated pixels, so you have to resample to a higher (left) or lower (right) resolution when transferring an image to disk. Although more pixels generally leads to better detail, you may prefer to download the low-res images since they take up considerably less room on disk and the detail that remains is crystal clear.

Cabling and Charging

The PDC-2000 transfers images to your Mac via a SCSI connection, and the camera must be the last device in the chain. The included SCSI cable is only 3 feet long, which is awfully short when you are capturing pictures directly to your hard drive. The camera includes a tiny, nonstandard SCSI port, so you can't substitute a longer cable. The only solution is to purchase a specialized 6-foot cable from Polaroid for $99.

Polaroid's functional PDC-2000 Direct software lets you transfer TIFF images to your hard drive or load them directly into Adobe Photoshop via a plug-in. For cross-platform users with SCSI-equipped PCs, Polaroid also bundles a Windows utility and a TWAIN module.

Four rechargeable NiCd batteries supply the PDC-2000's power. You plug the camera directly into a wall socket to charge the batteries, which I consider to be the height of convenience. Polaroid claims that the battery charge should last 150 pictures, but because I rarely shot more than 40 pictures in a single day, I wasn't able to take more than 80 pictures without recharging. You also have to factor in the time you spend retrieving the images from the camera—if you plug in the camera every time you transfer pictures, you'll reduce the life of the batteries.

The Last Word

The PDC-2000 is a new breed of digital camera that combines professional quality and affordability. All my complaints are fairly minor, and by and large are limitations of digital photography technology.

If you've been waiting for digital cameras to mature, the PDC-2000 marks a clear jump from infancy to adolescence. And as an added incentive, you get a futuristic housing that's guaranteed to make you the envy of every computer geek on the block.—DEKE MCCLELLAND

RATING: ★★★★/7.8 **PROS:** Great picture quality for the price; straightforward controls; remembers settings between sessions; excellent automatic flash; convenient recharging. **CONS:** Troublesome viewfinder; could provide better feedback; short SCSI cable. **COMPANY:** Polaroid (716/256-4436, ext. 868, *http://www.polaroid.com*). **LIST PRICE:** $3695 as tested.

PowerBook Upgrades

SOLID PATH TO POWERPC FOR 500-SERIES NOTEBOOKS

DESPITE MY EARLY-ADOPTER TENdencies, I avoided the first generation of PowerPC PowerBooks. I was proud of my restraint when the PowerBook 5300 series turned out to be buggier than a Louisiana swamp, and the recent recall made me even haughtier.

Like many PowerBook owners, I was willing to stave off my need for speed until Apple delivered its long-promised PowerPC upgrade. The wait was almost unbearable, but at last there are two upgrade choices for the 500 series.

Both Newer Technology's Nupowr and Apple's upgrade replace the daughtercard in your PowerBook; the Nupowr is equipped with a 117MHz 603e chip, while Apple's card sports a 100MHz 603e processor. The Nupowr comes in 4MB and 8MB flavors, as well as in a low-priced option with no on-board RAM; Apple offers a single 8MB model, priced nearly $450 less than the comparable Newer card. (Both accept existing RAM, up to a maximum 36MB.)

The price difference is slightly offset by the speed difference of the two processors, but unlike the Nupowr—which voids your warranty—the Apple upgrade provides a one-year warranty extension. Newer offers an $80 rebate when you send in your old 68040 daughtercard, but the offer is scheduled to expire at the end of June.

Unless you enjoy tinkering with the guts of your PowerBook, pay a dealer to install the upgrade. It should require less than an hour's worth of labor to install the board and the latest system software.

GIBSON

For the more technically inclined, the upgrade process is about as difficult as installing a modem and requires the same tools: a Torx wrench and a delicate touch.

Performance on Par

The Nupowr offers speeds comparable to a PowerBook 5300c's for most tasks, and outperforms the 5300c in floating-point operations such as spreadsheet recalculations. With its 100MHz processor, Apple's upgrade is slower, but not by much. Both upgrades offer a speed improvement of two to three times the 500-series' performance, and more if your work is spreadsheet- or graphics-intensive.

Time Will Tell

During testing, we uncovered two compatibility problems with both upgrades; the Newer documentation acknowledges these problems. Global Village internal modems won't work until you upgrade to version 2.5.5 of its software (included in the Nupowr package). And if you have an early version of the PC Card cage, you need to upgrade to Revision C, available free from Apple.

The biggest compatibility question surrounds Copland, the next generation of the Mac OS. Although Apple says it won't guarantee Copland's compatibility with any PowerPC upgrade card, Newer vows to do whatever it takes to make Nupowr work with Copland. Since Copland is still in development, *no one* can guarantee that any upgraded Macs will run with it; don't hold your breath.

The Last Word

Conventional wisdom says that you should never upgrade—better to sell your old machine and get a new one. But both of these products prove that axiom wrong by offering greater reliability and speeds comparable to the PowerBook 5300's. Newer's Nupowr is a better choice if you need to squeeze every ounce of speed from your PowerBook, but if you're more concerned with PowerPC compatibility and price, the Apple upgrade is the better value.—MATTHEW HAWN

Nupowr for PowerBook 500 Series

RATING: ★★★★/7.3 **PROS:** Good performance; multiple configurations. **CONS:** Minor compatibility problems. **COMPANY:** Newer Technology (316/943-0222, *http://www.newertech.com*). **LIST PRICE:** With no RAM, $745; with 4MB of RAM, $975; with 8MB of RAM, $1215 (all prices less $80 rebate through June).

PowerBook 500 PowerPC Upgrade

RATING: ★★★★/7.6 **PROS:** Less expensive than Nupowr; good performance; extends warranty. **CONS:** Minor compatibility problems; single configurations. **COMPANY:** Apple Computer (408/996-1010, *http://www.apple.com*). **LIST PRICE:** With 8MB of RAM $769.

MW LAB

PowerBook Upgrades: Close to the Real Thing

Best result in test. Longer bars are better. Products listed in decreasing order of overall performance. Indexed scores indicate performance relative to a PowerBook 520c (520c = 1.0).

PowerBook Model (Processor)	RAM	Core Performance	CPU-Intensive	Floating-Point–Intensive	Disk-Intensive
5300c/117 (117MHz 603e)	32MB	2.89	2.02	11.05	1.75
520c w/NUpowr upgrade (117MHz 603e)	24MB	2.71	1.82	11.19	1.52
520c w/Apple upgrade (100MHz PPC 603e)	24MB	2.50	1.71	9.88	1.50

Behind Our Tests

Native versions of business applications were used to test PowerPC-equipped units; 68K versions were used for the PowerBook 520c reference system. (Since FileMaker Pro 3.0 was used in this benchmark, results should not be compared with previous PowerBook benchmarks, which used FileMaker Pro 2.13.)—**Macworld Lab testing supervised by Matt Clark**

Image-Management Programs

TROPIX AND CUMULUS TAME CHAOTIC IMAGE FILES—WITH VARYING DEGREES OF SUCCESS

BOTH CANTO SOFTWARE'S CUMULUS Network Image Database 2.5 and Alaras's Tropix 2.0 promise to create order out of chaotic image files. Designed for anyone who needs to keep track of thousands of digital images over a network, these image-management systems let you catalog your image files for future reference. Cumulus emphasizes speedy cataloging and searching, while Tropix—at almost three times the price—also supplies built-in tools for file conversion and batch processing.

Cumulus 2.5

Cumulus lets you catalog information about thousands of multimedia files—clip art, scans, movies, sounds, even PowerPoint presentations and QuarkXPress page layouts—in a searchable database that users can share over a network. (A $199 single-user version is also available.) Version 2.5 adds excellent support for AppleScript and several useful scripts that automate database functions. Canto also recently announced the Cumulus Internet Image Server, a free CGI (Common Gateway Interface) that enables Cumulus to serve images on the Web.

Cumulus Network turns a Macintosh into a centralized server for your image catalogs and lets you control access to the image databases, while Cumulus Client lets users on the network view and modify the catalogs. Both let users add, delete, and rename images and add notes and keywords to catalog entries.

Cataloging files in a Cumulus database is simple, if not particularly fast. You choose the Catalog command and direct the program to the files you want to include; Cumulus creates a thumbnail representation of each image file and logs the file information (rather than the actual file) into its database. Unfortunately, you can't drag the thumbnails into a new order or change their size. Cumulus makes up for that by accepting a wide range of file formats and offering 33 import filters that can be turned on or off individually. You can even use the included plug-ins to export images directly from a Cumulus database into QuarkXPress, Adobe Photoshop, or Adobe Illustrator.

Cumulus's Find command speedily searches for files using up to 15 criteria, such as keyword or file type; you can also drag an image thumbnail into the Find window. Locating a file in a database containing hundreds of images took only a few seconds in my tests. Creating keywords and assigning them to catalog entries is also a simple drag-and-drop process. These features make Cumulus a more powerful database tool than image browsers such as Adobe Fetch and Kudo Image Browser and vastly superior to Tropix. Just pray you don't run into trouble: a tech-support number is nowhere to be found.

Order Out of Chaos You can organize images with Cumulus by dragging words from the Keywords window and dropping them onto thumbnails.

Tropix 2.0

While Cumulus is designed for organizing, browsing, and copying images, Tropix can also convert the formats, sizes, and resolutions of the cataloged images. Tropix can convert files automatically, but that's its only real selling point; as a network image database, the program is slow, awkward, and buggy.

Tropix Server, for example, does nothing more than open an existing Tropix image database and make it available to clients on the network. To create or modify a database or set access privileges for other database users, you need Tropix Client or the $490 single-user program. Even the mechanism for opening a database with the server software is clumsy; you have to open both the main database and an auxiliary database file.

The Tropix Client program is somewhat better, although the first version I tested was buggy and confusing. (After I called about the problems, Alaras fixed the bugs and released version 2.0.5.) To add images to the database, you simply select them in the hierarchical view and drag them to the catalog button on a floating palette; Tropix catalogs the file information, then creates a thumbnail and a low-resolution preview image.

Fixing the interface glitches didn't make Tropix any stronger as a database, however: its search capabilities are limited, and the search engine is considerably slower than Cumulus's. And although you can create an unlimited number of custom fields for storing image data, you can't search on those fields. (Alaras says Tropix 2.1 will have a new search engine and an updated interface.)

The Last Word

While it lacks some flexibility in the way it displays thumbnails, Cumulus is a powerful, well-designed tool for managing images and sharing them over a network. Its AppleScript and drag-and-drop support make it especially appealing. Tropix, on the other hand, isn't worth considering until its interface is improved and the search engine beefed up.—JOSEPH SCHORR

Cumulus 2.5

RATING: ★★★/6.9 **PROS:** Supports a range of file formats; fast searching; users can share image catalogs over a network. **CONS:** Can't reorder or resize thumbnails; no technical-support number provided. **COMPANY:** Canto Software (415/905-0300, *http://www.canto-software.com*). **LIST PRICE:** Server with five clients $1795; additional five-client packs $1195.

Tropix 2.0

RATING: ★★/3.7 **PROS:** Translates a wide range of graphics formats; supports batch processing. **CONS:** Confusing interface; weak search engine and server software. **COMPANY:** Alaras (919/544-1228). **LIST PRICE:** Server $4990.

UniQorn 1.01

QUICKDRAW GX SUPPORT—BUT NOT MUCH ELSE

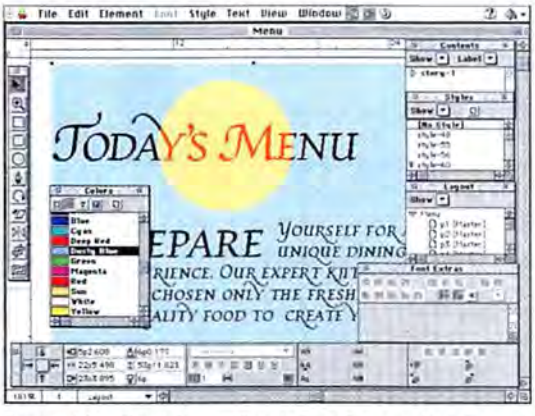
UNIQORN, A NEW PAGE-LAYOUT system from United Kingdom–based SoftPress Systems, has typographic controls that rival those found in desktop publishing giants QuarkXPress and Adobe PageMaker. But while the fledgling program is unique in its support of QuickDraw GX, it's too quirky, sluggish, and unpolished to be a real threat to the competition.

A Unique Approach

Designed to produce professional color layouts, UniQorn is strikingly similar in look and feel to PageMaker and QuarkXPress. In other ways, its approach to document construction is unique. For example, each page in a UniQorn document is composed of frames, which can contain either text or graphics. (In contrast, QuarkXPress uses two kinds of containers for imported content—text boxes and picture boxes.) To add content to a UniQorn page, you draw a frame (a rectangle, rounded rectangle, oval, or custom shape) and import text or graphics into the frame. Unfortunately, UniQorn handles these tasks—from importing graphics to formatting text—considerably more slowly than the competition.

Another of UniQorn's distinguishing features is what SoftPress calls *flexible presentation:* when you add a frame to a page, you can assign frame dimensions that are relative to the page rather than fixed, absolute values. If you change a document's page size or orientation—to turn a portion of a book into a brochure or to turn a printed document into an Acrobat file, for example—all the frames on your pages automatically resize and reposition themselves accordingly.

The program's handling of style sheets is also unique and somewhat confusing. Every time you add a formatting attribute to selected text in a frame, UniQorn creates a new temporary style and displays it in the Styles palette. You can ⌘-click on a temporary style at any time to rename it and make it permanent. What's confusing is that a style created this way doesn't have all the attributes of the text on which it is based, but only those that were added to the previous style. For example, if you select an existing block of text and apply a new color to it, UniQorn creates a new temporary style that contains *only* the color information. All the other attributes—font, size, leading, and so on—are ignored. On the plus side, UniQorn lets you embed HTML tags in each style definition so you can export text that's ready for the Web.



Fonts with a Flourish UniQorn's Font Extras palette lets you access QuickDraw GX–specific features, such as flourishes and swashes, when formatting GX fonts. The Layout palette displays an overview of the frames on each page, and the Contents palette lets you navigate a document by story rather than by page.

Control and Complexity

Thanks to its support of QuickDraw GX, UniQorn allows tremendous control over typography. You can adjust characters' weight and slant precisely, or apply ligatures, swashes, flourishes, fractions, superscripts, and subscripts—provided you're using GX fonts that contain enhanced character sets. And that's the problem: to take advantage of certain features, you *need* GX fonts, and UniQorn includes only a handful. The program won't even run without QuickDraw GX 1.1.1, which in turn eats up another 2.5MB of RAM and may introduce compatibility problems as well.

Along with all the precision font and frame controls comes an unforgiving complexity. UniQorn's numerous palettes are crammed with tiny, cryptic buttons, icons, and fields that do little more than hint at their functions. The Control palette's Frame Controller area, in which you determine whether a frame's dimensions are fixed or relative, is almost incomprehensible without extensive fumbling about in the manual. And the manual itself is weak, with alien terminology and complex explanations ("A child frame has two sets of three interrelated parameters . . . "). Adding to the program's complexity is poor organization of menu commands; for example, Find/Replace is found not in the Edit menu (as in most programs) but in the Text menu.

As a basic page-layout program, UniQorn lacks some standard features. You can't, for example, create gradient fills or apply tints of existing colors. Word processing features are also weak: the program doesn't support drag-and-drop text editing, there's no word-count feature, and you can't paste text into the Find/Replace dialog box.

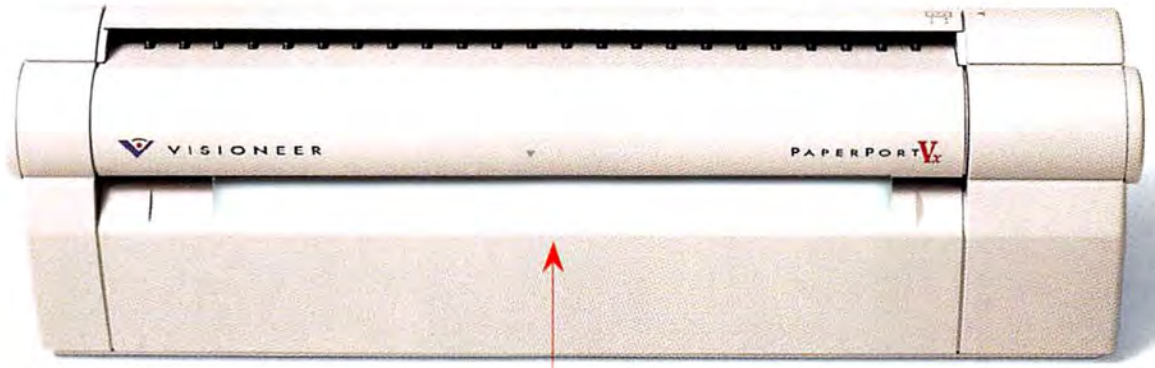
Beyond that, some features appeared mysteriously nonfunctional in the version I tested. When you lock a frame, for example, the Lock command remains undimmed in the Element menu. And while locking a frame prevents you from dragging it in the layout, it doesn't stop you from changing all of its settings in the Control palette, because it's not really locked. Finally, I experienced repeated crashes even after allocating extra memory to the program.

The Last Word

UniQorn's approach to document creation is certainly unique, and the program's QuickDraw GX support allows you to create some gorgeous typographical effects. It's no Quark-killer, but with some polish and more stability UniQorn may someday be able to hold its own in the competitive world of page layout.—JOSEPH SCHORR

RATING: ★★★/5.3 **PROS:** QuickDraw GX support; resizes and positions frames when document orientation changes; precise typographical controls. **CONS:** Slow; confusing interface; buggy; weak word processing features; can't apply gradient fills or tints; inadequate manual. **COMPANY:** SoftPress Systems Limited (415/331-4820, *http://www.softpress.com*). **LIST PRICE:** $895.

Go ahead, feed it.



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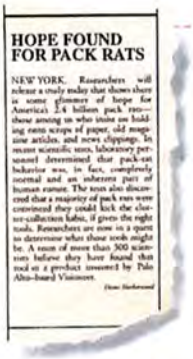

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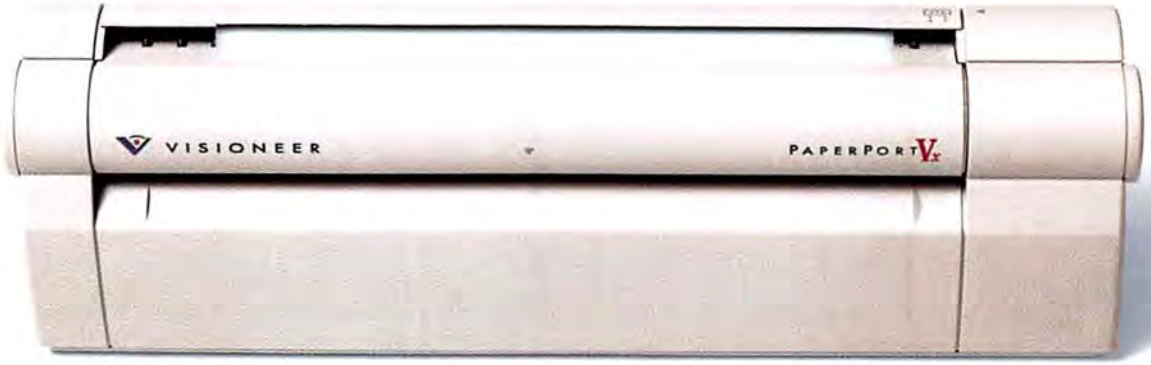

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Now Utilities 6.0

WHEN BAD UPGRADES HAPPEN TO GOOD PRODUCTS

VERSION 6.0 OF NOW UTILITIES adds three new components—Now AutoType, Now Shortcuts, and Now Tabs—to its collection of system enhancements. Unfortunately, these additions are neither compelling nor innovative, and probably aren't worth the price of the upgrade for current Now Utilities owners.

Now AutoType works in any application to expand an abbreviation into a word, phrase, or paragraph. For example, if I type the abbreviation *tnadd*, AutoType replaces it with my name and mailing address. AutoType can also use hot keys. AutoType triggers only after you type the abbreviation followed by a tab, space, or return, so if you want to include a text macro before a comma or at the end of a sentence, you're forced to type unnecessary keystrokes. Casady & Greene's Spell Catcher (previously Thunder 7) and the shareware TypeIt4Me do a far better job, triggering after any punctuation.

AutoType's one partially redeeming feature is that it can suggest new text macros by watching for frequently typed phrases, but the manual fails to mention that this feature requires you to enable Now Save's keystroke saver. I found AutoType maddeningly inconsistent, sometimes working properly, sometimes not, for no detectable reason.

When you click on a file or folder in the Finder while holding down a modifier key, Now Shortcuts pops up a menu that lets you perform common functions on the item, such as duplicate or make an alias. Since these features are already available from the Finder's menus, Now Shortcuts isn't especially valuable.

Now Tabs displays a bar at the bottom of the screen in the Finder. Drag an open window to the bar and it becomes a tab. Clicking on the tab pops up the window. The trouble is, tabs are just open windows; you can't drag applications or documents to the tab bar. Now Shortcuts and Now Tabs accept plug-in modules to extend their capabilities, so they may become more valuable as Now and third parties create new plug-ins.

The other Now Utilities components are little improved. The excellent Now Super Boomerang and Now Menus, as well as Now Folder Menus, can now create hierarchical menus ten levels deep. Other components got some bug-fixes and minor enhancements, though Now Save seems to have *more* bugs; it crashed my Mac regularly until I disabled it. Now Scrapbook was neglected altogether; it still doesn't support drag and drop.

One unwelcome change is a new installer. Inexplicably, Now Software ditched the previous Now Installer, which allowed you to install, remove, or update any or all components, in favor of a program that installs all components and doesn't allow a custom install.

A slew of angry messages on Now Software's AOL support forum testified to the wisdom of waiting for bug-fixes before upgrading. A Now spokesperson promised that updates will be available to cure some, if not all, of the problems found in my testing.

Dubious Enhancements Now Tabs has anchored the Applications window to the tab bar, while Now Shortcuts allows me to label the folder—just as I could have done from the Finder's Label menu.

The Last Word

Now Utilities remains a good set of desktop utilities because the core components alone—Now Super Boomerang, Menus, Startup Manager, and WYSIWYG Menus—justify the package price. If you don't already have Now Utilities, it's worth purchasing. For current owners, however, version 6.0 gives no compelling reason to upgrade.—TOM NEGRINO

RATING: ★★★/6.4 **PROS:** Now Super Boomerang, Menus, and WYSIWYG Menus provide must-have enhancements. **CONS:** New components are lightweights; Now Save and AutoType are buggy. **COMPANY:** Now Software (503/274-2800, *http://www.nowsoft.com*). **LIST PRICE:** $89.95.

Bryce 2

CREATE AWE-INSPIRING, PHOTO-REALISTIC 3-D LANDSCAPES

METATOOLS' BRYCE 2 GENERATES stunning, fractal-based 3-D terrain objects that you can embellish with natural-looking textures and visual effects. Ray tracing enhances the photo-realism of these images, which are suitable for professional-level illustration, video, or multimedia production.

Beyond generating terrain objects, Bryce 2 gives you tools for building infinite planes representing the ground, water surfaces, and cloud layers; an array of object primitives for building simple structures; and an assortment of lighting options. Other tools build symmetrical terrain objects, variably shaped stones, and freestanding 2-D PICT objects. Bryce also lets you apply Booleans to grouped objects. You can gouge one object with another or build a new object from the intersecting surfaces of two shapes. However, these are rendering Booleans, not object-editing tools; the objects themselves aren't altered, and the effect exists only in the rendered image.

Bryce 2 won't be your first choice for object modeling. It's more capable than its predecessor, but its shape-manipulation capabilities are limited. Producing complex Boolean objects can be cumbersome. You will appreciate Bryce 2's ability to import models as DXF files—a feature sorely missing from version 1. Of course, Bryce's forte is creating images, not modeling, and it does that beautifully. With the terrain editor, you can manipulate the gray-scale map that controls the visual contours of mountains. You can make mountains taller or more jagged simply by painting in the editor. Other controls let you change surface conditions; for example, you can sharpen or soften edges.

The Sky&Fog palette offers a wide array of shadow, fog, haze, and cloud effects (see "Suitable for Framing"). You can adjust the clouds' frequency from a few fair-weather puffs to completely overcast, and fine-tune their density from lacy cirrus to dark, threatening nimbus. Similarly, you can obscure nearby objects with fog and drape distant mountains with wispy haze. Each element is independently adjustable and infinitely variable.

continues

Bryce 2 offers equally extensive control over individual object texturing. The materials editor lets you combine textures and manipulate surface properties and has some of the best texturing controls anywhere. In fact, it's so easy to add rendering complexity that generating images can take hours, even on a Power Mac.

A large collection of preset options for environments, terrains, and material textures is included, as is an assortment of useful Boolean objects and PICT images. Best of all, the CD includes dozens of completed landscapes that you can deconstruct and study.

Bryce 2 invites you to experiment. Unfortunately, it also *requires* that you do so; the thin manual only skims the surface and would benefit from a thorough edit (for example, it refers twice to nonexistent sidebars). The CD-based documentation duplicates the printed manual, errors and all, and includes a Deep Reference that's deep in name only. Bryce 2 isn't difficult to use, but expect to spend time learning its nuances and adjusting to its unique, visually pleasing interface.

Suitable for Framing Studying scenes like this one, from the program CD's Sky&Fog palette, can help you learn Bryce imaging techniques.

The Last Word

Although limited in its object-modeling capabilities, Bryce 2 is wonderful for creating professional-quality 3-D landscapes and natural-looking environments. And have I mentioned how much fun it is?—CARLOS DOMINGO MARTINEZ

RATING: ★★★★/7.7 **PROS:** Produces extraordinary landscapes; excellent texturing controls. **CONS:** Limited modeling capabilities; weak documentation. **COMPANY:** MetaTools (805/566-6200, *http://www.metatools.com*). **LIST PRICE:** $299.

Peak 1.02

DIGITAL-AUDIO PROGRAM COMBINES VERSATILITY AND POWER

PEAK, A RECORDING AND EDITING program, joins the Mac digital-audio jam session with an appealing mix of features and performance. Like Macromedia's SoundEdit 16 and Digidesign's Sound Designer II, Peak 1.02 is a professional-quality waveform-oriented program. But it's the only one that supports both software-only audio and dedicated audio cards.

Peak isn't designed for multitrack recording, unlike Macromedia's Deck II 2.5 and Opcode's DigiTrax. While multitrack programs can record six or more tracks, Peak lets you record only two.

Peak's basic editing and playback features are unmatched. The program allows an unlimited number of Undos, and it doesn't make changes to a file until you save, making editing extremely fast. An Edit window lists alterations and lets you restore the file to its state at a specific point. Unlike SoundEdit 16 and Sound Designer II, Peak continues playing audio in the background when you switch to a different program. You can even modify a sound file while playing it.

Peak's scrubbing feature is unique. Rather than lowering the playback pitch as you scrub, Peak retains the original pitch. (It does so by repeating snippets of the audio file over and over.) This sounds disconcerting at first—scrubbing slowly often delivers a Max Headroom–style stuttering effect—but it works well. For traditionalists, Bias plans to add tape-style scrubbing to Peak 1.1, a free upgrade that should ship by the time you read this.

Unlike SoundEdit 16, Peak doesn't provide built-in audio effects such as reverb and echo. This isn't a serious shortcoming, however. Peak does support Adobe Premiere–format audio filters; several filter and effects collections are available from Waves (*http://www.waves.com*) and InVision Interactive (*http://www.cybersound.com*). These are first-rate packages; Waves offers the premier plug-in collection for high-end audio work.

Peak also has a proprietary plug-in format. Bias offers four plug-in families: one produces special audio effects, one lets you edit and loop sounds for music samplers, one provides click removal and other audio-processing functions, and one combines Peak with a database manager to manage a library of sound files. Each package retails for $129.

Peak 1.02 lacks SoundEdit 16's broad file-format support; it can't even import or save Windows-format WAV files. Peak also lacks bit-depth conversion options such as dithering. Bias plans to add more file-format and conversion support to future versions. Meanwhile, Peak users who need top-quality bit-depth conversion and optimizing can turn to Waves' L1 Ultramaximizer or AudioTrack.

Peak 1.02 is incompatible with System 7.5.3, but version 1.1 should fix this. Also, Peak 1.02 doesn't let you open QuickTime movies and edit their sound-tracks. Bias plans to add QuickTime sound support to version 1.1; meanwhile, you can work with QuickTime audio by exporting soundtracks as AIFF files.

A Peak Inside Peak's unlimited Undo feature makes it easy to experiment with edits.

The Last Word

If you need audio software that will let you do multitrack recording, file-format conversion, QuickTime soundtrack editing, and Web or CD-ROM optimizing, your best bet is Macromedia's $399 bundle of SoundEdit 16 and Deck II. But if you're looking for a program that will sail through complex editing jobs, support a dedicated audio card, and also talk to a sampler, look no further than Peak. It's a first-rate program for professional audio work.—JIM HEID

RATING: ★★★/6.9 **PROS:** Fast; unique scrub feature; extensible; supports software-only audio, as well as dedicated audio cards. **CONS:** Limited file-format support; offers no dithering in bit-depth reduction. **COMPANY:** Bias (415/331-2446, *http://www.bias-inc.com*). **LIST PRICE:** $299.

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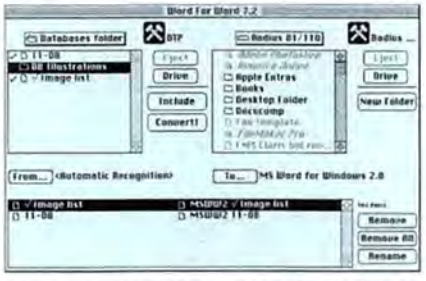
Adobe File Utilities

MAC UTILITIES ARE BETTER ON WINDOWS

ADOBE FILE UTILITIES 1.0 COMbines updated versions of DocuComp and Word for Word in a cross-platform package for Macs, PCs, and Unix workstations. Sadly, these formerly Macintosh-only tools are better integrated and more powerful in the Windows adaptation.

Adobe File Utilities consists of several components—some cross-platform and others platform-specific. The main component is Word for Word, a file-conversion utility. While rich in DOS and Windows support, Word for Word doesn't support several current Mac word processors. Also, converted spreadsheets do not include formulas, graphics, or macros; and database support is weak.

The Mac version of Word for Word includes Document Converter, a handy drag-and-drop utility. To convert files,



Translating Files with Word for Word Word for Word identifies the file type of each original document, while you select the type to which it will be converted.

you drag documents onto a Document Converter icon. You can dedicate different icons to different file conversions.

Under Windows, Word for Word has notable enhancements, including context-sensitive help, the ability to filter the file list, and a direct link to the Viewer application (enabling you to *see* any file before converting it). Alas, the Mac version doesn't include these features.

You'll find Word for Word most valuable when you routinely have to deal with unusual or old PC applications, you don't already have other translators, or your current programs do not offer appropriate import and export options.

DocuComp compares different versions of a document, showing all additions, deletions, and moves. On the Mac, only WordPerfect 2 and 3, Microsoft Word 4 and 5, and text files are supported.

After choosing two files to compare, DocuComp displays them both. You can show text that has been added, deleted, or moved in different colors or font styles. As you review the differences, the document windows scroll in sync. You can print or save a composite document that shows the differences, as well as a revision list. DocuComp can ignore selected text blocks and font styles when making comparisons. You can also specify table-handling options, vary settings for the composite document, and set comparison sensitivity.

The most impressive part of Adobe File Utilities is only available for Windows. Viewer enables you to view, print, and search for text within documents from almost any Mac or PC application. Viewer can also unzip PKZip archives, UUEncode or UUDecode files, copy text and graphics to the clipboard, and display the document at different magnifications.

Adobe File Utilities includes Adobe Acrobat Reader, letting users read, search, and print the text of the online manuals. To the dismay of many (including myself), no printed manuals are provided.

The Last Word

Adobe File Utilities 1.0 is a much stronger package for Windows than for the Mac. If you work in a mixed-platform office or also use a PC, you may well find the Windows components—particularly Viewer—indispensable. Mac users, on the other hand, may feel that Adobe has slighted them. While the Mac components work well, they lack the capabilities of the Windows software.

File-conversion utilities are common on the Mac, and you may already have a program (such as Microsoft Word 6) that does document comparisons. For many of us, the only "to-die-for" utility in Adobe File Utilities is Viewer. And Viewer for the Mac doesn't exist.—STEVE SCHWARTZ

RATING: ★★★/5.3 **PROS:** All platforms supported on single CD-ROM; easy to use; drag-and-drop file conversions. **CONS:** No printed documentation; spreadsheets converted by Word for Word lose formulas, macros, and graphics; few compatible word processors for DocuComp; Viewer is only for Windows; one free support call. **COMPANY:** Adobe Systems (415/961-4400, *http://www.adobe.com*). **LIST PRICE:** $149.

Internet-Aware PIMs

IN CONTROL AND WEBARRANGER JUMP ON THE INTERNET BANDWAGON

THESE DAYS, EVEN PERSONAL information managers are expected to be Internet-savvy. In Control 4.0 and WebArranger 2.0 are two PIMs that have been successfully updated to meet that challenge. Even if you don't spend much time on the Net, both are a worthwhile investment.

In Control 4.0

Like its predecessor, In Control for Workgroups 3.5 (see *Reviews*, September 1995), In Control 4.0 lets you view an outline, a calendar, or both. Even though *Workgroups* has been dropped from the

Special Agent WebArranger's URL Agent automatically tracks changes to specific Web pages.

name, In Control 4.0 retains the ability to share data without a dedicated server. Its approach to sharing schedules isn't as flexible as that of server-based PIMs like Now Up-to-Date, but it should suffice for most applications.

A database-lookup function lets you copy contact information from several address-book and database programs, including Now Contact and Claris FileMaker Pro. Version 4 also sports several cosmetic and performance enhancements.

In Control's new Link to Internet Site command links any item in an In Control file to a Web page: simply double-click on a linked item's bullet while holding down the control key to open your Web browser and go directly to the desired site. In Control also lets you import and export Netscape Navigator bookmarks or import URLs from HTML text files.

WebArranger 2.0

WebArranger began life as Arrange, an unusual database/PIM hybrid. Although it worked well for storing day-to-day information (see *Reviews*, December 1994), it was harder to use than dedicated PIMs and never attracted much of a following. CE Software recently acquired Arrange from Common Knowledge and repackaged it as a capable Internet utility.

Although its PIM functions are no more accessible than Arrange's, WebArranger's new Internet tools are well adapted to life on the Web—the program is great for organizing Web pages and storing E-mail addresses. Simply click on an URL and press ⌘-R to launch your Web browser and go to that site.

WebArranger's *agents*, which automate various Internet housekeeping chores, are even more valuable. The URL Agent checks at predefined intervals to see if a Web page has changed (see "Special Agent"), and the FTP Download Agent periodically logs on to busy FTP sites to download files. WebArranger also comes with ForeFront's WebWhacker, a separate application that lets you download Web pages and view them offline.

WebArranger's lone weak point is skimpy documentation. The program comes with extensive help in a WebArranger document, and CE's Web site offers a wealth of useful information, but I'd still prefer a more thorough printed manual (CE says a new manual is in the works).

The Last Word

If you're searching for a general-purpose scheduler and you're comfortable using outlines to prioritize tasks, In Control 4.0 is an excellent choice. WebArranger isn't my first pick as a PIM, but its powerful Internet functions make it indispensable for Net jockeys.—FRANKLIN TESSLER

In Control 4.0

RATING: ★★★★/7.0 **PROS:** Powerful schedule manager; launches URLs directly. **CONS:** Data sharing could be more flexible. **COMPANY:** Attain (617/776-1110, *http://www.attain.com*). **COMPANY'S ESTIMATED PRICE:** $85.

WebArranger 2.0

RATING: ★★★★/7.1 **PROS:** Organizes and launches URLs; automates Internet chores. **CONS:** Skimpy manual. **COMPANY:** CE Software (515/221-1801, *http://www.cesoft.com*). **LIST PRICE:** $99.95.

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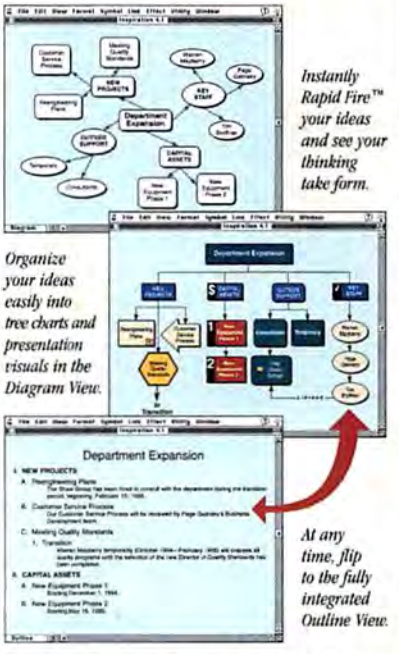

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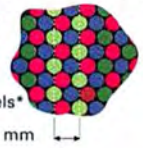

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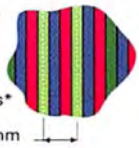

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TeleFinder 5.0

BBS SOFTWARE THAT UNDERSTANDS THE NET

BULLETIN BOARD SYSTEMS HAVE an image problem in the age of the Internet, but Spider Island's TeleFinder 5.0 may help change all that. This BBS software now doubles as a Web server, offering limited Internet access without sacrificing the user friendliness and collaborative spirit of a BBS.

In its new incarnation, TeleFinder gives small businesses the flexibility of open E-mail standards and the proprietary and control features of a BBS. Like SoftArc's FirstClass, it uses an SMTP gateway to deliver Internet mail automatically to the proprietary client software. But TeleFinder also supports the POP3 standard for Internet mail, allowing travelers to pick up their mail from the road using popular clients like Qualcomm's Eudora and Claris's Emailer instead of the TeleFinder client. TeleFinder's mail server is better integrated with Internet protocols, such as HTTP. And Spider Island has added a basic Web server that supports CGI scripts and multithreading. Although FTP is a faster, more powerful way to upload Web pages, TeleFinder makes the process much simpler.

TeleFinder functions as a client/server application, with a Mac server supporting both Windows and Mac clients. The administrator configures the server software with user information and sets variable access permissions through the User Manager utility. This utility is also where the administrator sets up the nodes (access lines) to the BBS, using either modem or TCP/IP access. Although the configuration dialogs are complex, the instructions in the manual are good enough that I was able to set up a BBS—with one modem node, one TCP/IP node, access to a file-download area, a new-uploads area, and two conferences—on a Power Mac 6100/66 in less than an hour. Once the BBS was configured, all I had to do was add new users and set permissions as needed.

But the true test of a BBS's utility is the user's experience with the client software. With the client and a TCP/IP or dial-up connection, users can chat, transfer files to and from the BBS, participate in discussions, use a Finger directory, send mail, and upload their own personal Web pages. I was able to create a personal Web site by simply dragging and dropping my HTML and image files into a folder. The server software supports CGIs in a sysop-controlled location, so users can't create CGI interactions that write to inappropriate sections of the Web site.

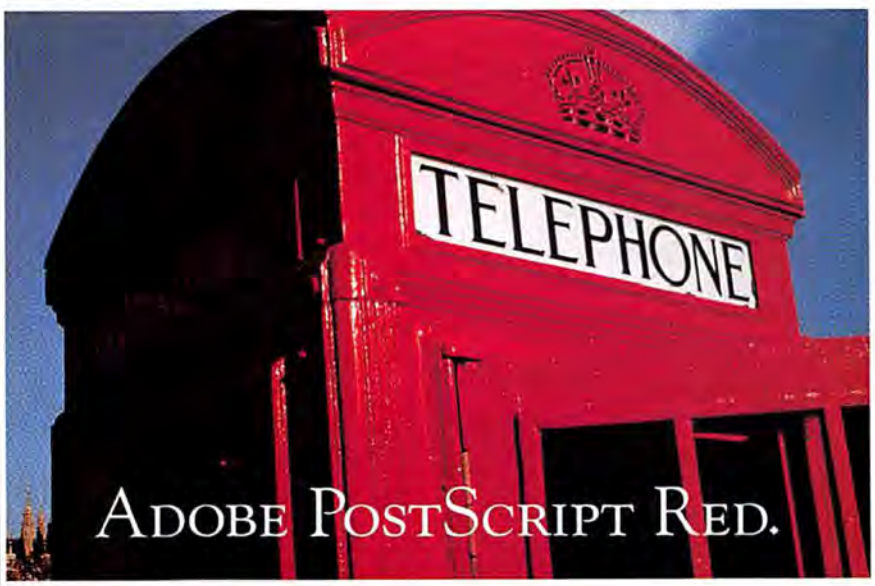
The Welcome Mat Spider Island's own BBS shows off the TeleFinder client's graphical interface.

The Mac client interface, with its drag-and-drop support, feels a lot like the Finder. The Windows client isn't as nice, but Spider Island is releasing an updated client that it claims will bring the Windows client's features closer to the Macintosh version's. And since TeleFinder's client software is proprietary, your connection to the BBS isn't the same as a direct Internet connection: TeleFinder lacks outgoing TCP/IP connections to the Internet and support for some important Internet protocols, so you can't, for example, browse the Web or transfer files via FTP.

The Last Word

TeleFinder is good (if basic) Web software that's best suited to hosting users' personal pages. If your primary goal is to serve Web pages for a business, you'd do best to stick with dedicated server software. As a small business's Internet and intranet hub, however, TeleFinder is a great alternative to more closed systems such as FirstClass and CE Software's QuickMail.—MATTHEW HAWN

RATING: ★★★★/7.2 **PROS:** Proprietary client is well integrated with Internet protocols. **CONS:** Client can't make TCP/IP connections to the Internet. **COMPANY:** Spider Island (714/453-8095, *http://www.spiderisland.com*). **LIST PRICE:** $675.



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—Susan Glinert, Computer Shopper, April '96 issue (page 496)

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—Peter Scisco, Computer Life, May '96 issue (page 108)

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LabView 4.0

THE BIGGEST AND BEST IN LAB SOFTWARE KEEPS GROWING

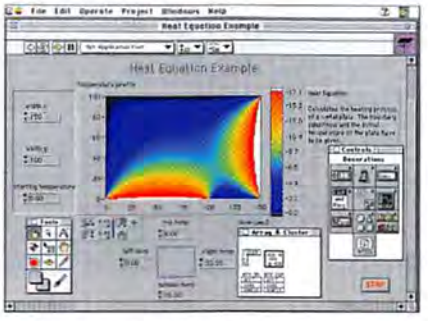
AT THE DAWN OF THE MAC ERA, National Instruments developed a complete software-based system that automates laboratory instrumentation and data acquisition. That took quite a leap of marketing faith—who could have foreseen that a computer whose main software offerings were MacWrite and MacPaint would someday be a major force in labs? That faith paid off; today the Macintosh is the most important platform in several scientific fields, including molecular biology and chemistry, and National Instruments' LabView is the dominant program for developing virtual instrumentation.

Not only is LabView the biggest of the lab software packages—the full Power Mac installation of version 4.0 needs 8MB of RAM and nearly 70MB of disk space—it's without question the most capable. With LabView and a data-acquisition card, your Mac can simulate any other lab information-gathering devices, from lock-in amplifiers to multichannel scopes to timers and controllers. And National Instruments has modernized the programming environment to look like a professional development package, arranging program sections hierarchically and adding dozens of aids for producing virtual instruments (VIs).

Although the amount of programming you now must do to implement specific VIs looks more daunting than in the last version, LabView 4.0's customizable floating palettes let you use existing VIs from the giant (300MB) library provided to create customized VIs to meet your lab's requirements (see "Post It!").

Amazingly, even with all the programming changes between versions 3.1 and 4.0, I was able to open and run all 18 items in my test suite of LabView 3.1 VI packages with no glitches (the cures for the few potential conversion problems are carefully explained in the documentation).

Version 4.0 resolves the odd printing bugs that plagued previous versions. Its graphing features rival those of dedicated scientific graphing programs, and tip messages appear like balloon help in little boxes near every important screen element. The Analysis library's math functions are now so comprehensive that you could set up LabView to manage a modest magnetic-resonance imaging effort. And the new Profiler lets you track down time sinks in your LabView projects. For network-oriented projects that involve analyzing lots of data from multiple instruments, this capability is crucial.



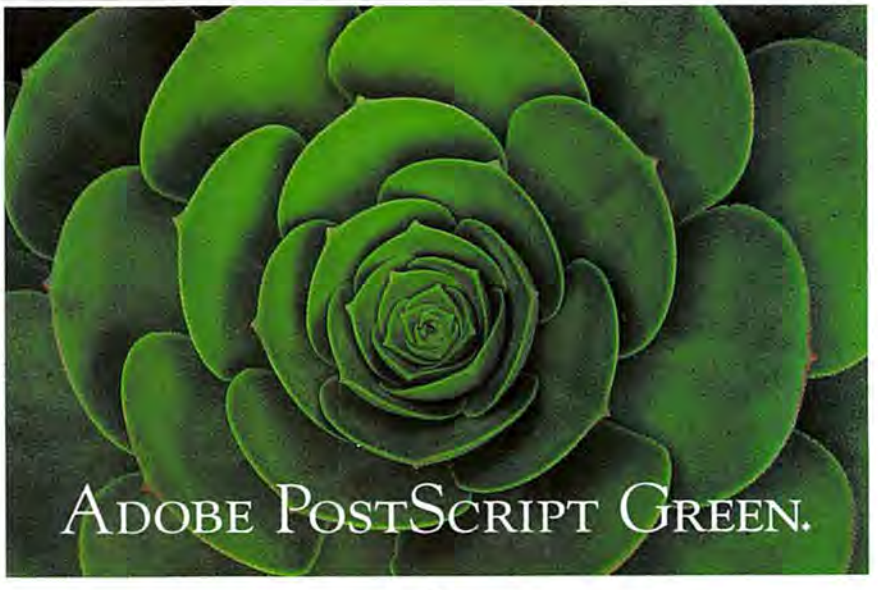
Post It! From a LabView palette associated with a particular virtual instrument, you can pull out and pin sub-VIs to display the most-used elements on screen (the two rightmost palettes have been pinned).

My misgivings about version 4.0 have more to do with the inevitable consequences of LabView's relentless evolution than with flaws in the program. You can now do real project-based programming, as you would in C++, but it won't be obvious to new users how to get a simple job—such as basic data logging—going quickly. Also, the days when a five-year-old Mac could serve as an inexpensive data recorder have ended with this release; a Mac IIsi with 6MB of RAM is no longer a LabView-ready platform. The excellent tutorial helps remedy the first problem, and the increasing availability of inexpensive Performas with big hard drives will eventually rectify the second.

The Last Word

LabView dominates the Macintosh lab-software market the way Microsoft Excel dominates the Mac spreadsheet market. Despite increased complexity and hardware demands, LabView is indispensable for Mac-based laboratories.—CHARLES SEITER

RATING: ★★★★/7.7 **PROS:** Huge library of virtual instruments; most customizable version yet; superior graphics and math capabilities. **CONS:** Requires serious commitment to training. **COMPANY:** National Instruments (512/794-0100, *http://www.natinst.com*). **LIST PRICE:** $1995; upgrades $295.



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NewsHopper 1.2

WELL-EQUIPPED USENET NEWS READER'S COMPETITION IS FREE

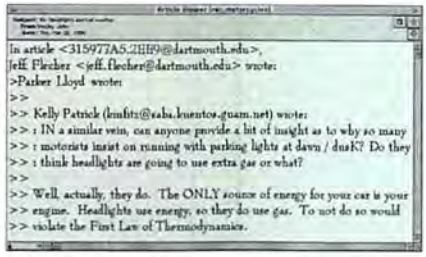
NEITHER CBS NOR HAM RADIO ever had it as good as the latest fad in long-distance communication with total strangers: Usenet newsgroups. While the World Wide Web continues to grab headlines, thousands of Net cruisers are also posting love letters, cries for help, and vicious flames to this loose network of discussion groups. LandWare's NewsHopper 1.2 is a well-equipped way to navigate this sea of text, and users who don't want to be tethered to a phone jack will welcome its advanced offline features. But desktop-based Usenet surfers may find both the hassle factor and the price a bit steep.

On your first connection to a news server, NewsHopper obtains a list of available newsgroups. You can scroll through it and highlight groups that interest you, or subscribe directly to a newsgroup by using the Subscribe command—such flexibility is typical of NewsHopper's design. Another convenient feature: you can subscribe and set the group preferences to several groups, all at once.

LandWare bills NewsHopper as an offline news reader, and most of its features are geared toward spending a minimum amount of time connected. For instance, NewsHopper's default setting retrieves only subjects and authors of articles on the first pass. Instead of maintaining a connection to the server and bringing up individual articles as you click on them, NewsHopper requires you to browse, marking the articles you want. When you're done, you request another connection, and NewsHopper collects the full text of the articles you've marked.

This sounds like a good idea, but it can end up being a lot of extra work; I generally downloaded entire newsgroups in a single pass just to avoid the hassle. Taking the easy way out, though, presented another problem: NewsHopper stores all retrieved articles in a single file. It's easy enough to compress the file and selectively purge old articles, but it's also easy to wind up with a multimegabyte file after just a few days of browsing.

Whether you're keeping an eye out for a favorite topic or just sick of suffering a Usenet fool gladly, you'll appreciate NewsHopper's robust filtering tools. The software will search an article's subject, header, author name, or body text for any text string; once it's found a match, NewsHopper will highlight or delete the article, as you desire. Useful as this tool is, I'd like to see an option to simply hide an article rather than delete it.



The Daily News Want to read colorful and authoritative advice from complete strangers? NewsHopper helps you surf the Usenet newsgroups.

Though it's stable, NewsHopper has some minor but irritating interface problems. For instance, article text doesn't wrap in windows. Also, changing the font in an article changes the font in every article in every newsgroup, but changing the font in a window listing newsgroup threads only affects the threads in that newsgroup. Overall, the interface lacks polish, tending toward cluttered dialog windows with lots of check boxes.

The Last Word

NewsHopper is the only stand-alone commercial news reader available for the Mac, but there are several high-quality freeware news readers available, including NewsWatcher, Nuntius, and YA-NewsWatcher, which adds article-filtering capabilities to NewsWatcher (visit Macworld Online to find these programs). NewsHopper's efficient offline processing reduces connection time, but unless that's really important to you, or you live out of a PowerBook and don't want to be tied to a telephone line, NewsHopper doesn't offer enough additional functionality to warrant shelling out cash for a news reader.—CAMERON CROTTY

RATING: ★★★/5.1 **PROS:** Full-featured, extensive filtering capabilities; offline processing. **CONS:** Several freeware utilities offer nearly the same functions. **COMPANY:** LandWare (201/347-0031, *http://www.landware.com*). **COMPANY'S ESTIMATED PRICE:** $59.

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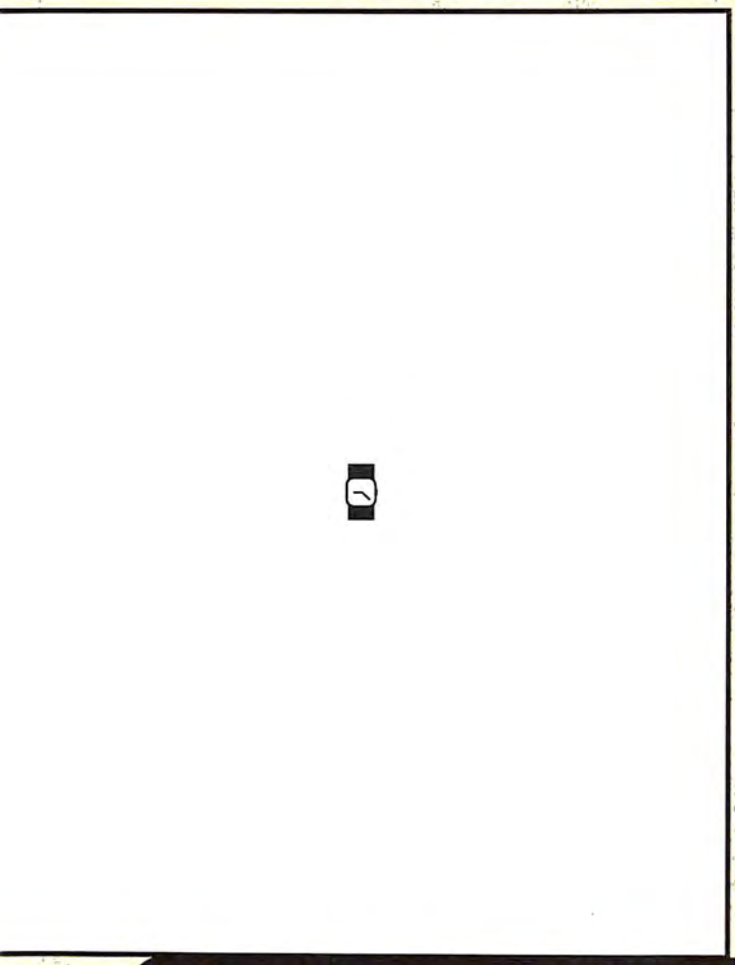

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PowerBuilder 4.0

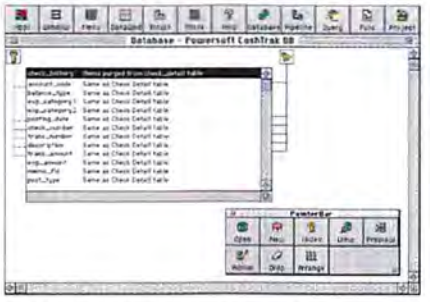
CROSS-PLATFORM DEVELOPMENT TOOL COMES TO THE MAC AT LAST

POWERSOFT IS INDEED A POWER IN the client-server database business: less than a decade old, it's one of the most important vendors of database-access tools for large systems, and PowerBuilder is established in its position as leading object-oriented, front-end application-building software in competition with similar products from Oracle and Informix. Until now, PowerBuilder's function was connecting Windows and Unix clients to corporate database servers on minicomputer-based networks, but version 4.0 puts Macs on the networks.

PowerBuilder's first Mac version is an interesting product, even if it calls for a fairly non-Mac mindset: files, for example, always have eight-character names with three-letter extensions, such as *interfac.ini*. In the Powersoft vision of the world, your job is to make visual query tools for looking into massive sets of relationally linked data tables (see "Data Basics"); although the Watcom SQL database is included (as is the InfoMaker query tool and assorted middleware for connecting to specific popular databases) in the PowerBuilder package, it's mostly for show—your real data is presumed to reside in SQL databases developed over the years using other software.

Two elements dominate constructing a PowerBuilder interface: DataWindow objects, the key elements of your interaction with PowerBuilder; and Transaction objects, which communicate with Oracle or the other databases. PowerBuilder provides a good collection of icon-based, dialog-box–driven programming tools for creating these objects, as well as a tutorial library of examples (some quite funny, remarkably enough) for beginners. It's fairly straightforward to create database-query applications, at first using only a few objects, then adapting these to more sophisticated tasks later.

As long as you keep things relentlessly simple, everything works fine, but complex layouts can take so long to update, you begin to fear your Mac has crashed (I tested on a Power Macintosh, although PowerBuilder 4.0 is, alas, nonnative, 680X0 code). To make sure your Mac creations run on other platforms, you need to resist the temptation to add convenience touches with AppleScript.



Data Basics You construct different interactive windows that constitute your application, mostly using this advanced DataWindows facility. Underlying everything is a set of basic data tables and relations, defined in a SQL database program.

A more serious problem is that the many data-handling features added by Windows developers using DDE (Dynamic Data Exchange) and OLE (Object Linking and Embedding) with PowerBuilder for Windows don't translate into anything on the Mac side, although Microsoft has clearly specified how this should be done (it's implemented in FoxPro, for example). In the corporate environment, these cross-platform mismatches will require programming workarounds. Nonetheless, it's possible to use PowerBuilder to make Macs effective client stations on a network with traditional SQL servers.

The Last Word

Like JAM 6 from JYACC (see *Reviews*, October 1995), PowerBuilder 4.0 offers one of the first paths for Macs to tap into the world of large-scale corporate relational databases. Despite a few flaws, its introduction is good news for database developers who want to expand the Mac's scope in large business environments. Version 5.0 has already been announced for later this year, and if Powersoft can work out the rough spots, PowerBuilder 5.0 promises to be a powerful cross-platform tool.—CHARLES SEITER

RATING: ★★★/6.4 **PROS:** Powerful, reliable tool set; builds Unix and Windows query tools, as well as Mac. **CONS:** Performance issues; some cross-platform glitches; not Power Mac native. **COMPANY:** Powersoft (508/287-1500, *http://www.powersoft.com*). **LIST PRICE:** $3295.

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WorldWrite 3.0

NEW WORD PROCESSOR IS PROMISING BUT NOTHING TO WRITE HOME ABOUT

YOU HAVE TO ADMIRE A COMPANY that dares to introduce a word processor into a crowded and contentious Mac market. WorldSoft's WorldWrite, which has been available for several years outside the United States, has some innovations but ultimately falls well short of its claim to be "*the* word processor for Macintosh."

The first thing you notice about WorldWrite 3.0 is its clean, uncluttered interface. Small icons in the scroll bars flip pages, switch among four magnifications, and show and hide rulers and the well-designed icon bar. Menus have been organized with care, and you can define a keyboard shortcut for any command.

Clean Windows Most formatting commands are condensed into a single row of icons.

The program also has strong writing and editing tools. Synonym searching and batch spelling checks are done via Casady & Greene's Thunder 7. You can copy any number of items to the Clipboard, and the program fully supports drag and drop. But WorldWrite lacks many related amenities: you can't undo drag and drops, the program doesn't remove extra spaces when you delete words, and it lacks multiple undos and automatic smart quotes.

The program's formatting capabilities are basically strong. You can specify any number of variable-width columns and change column formats anywhere on the page. Tables are easy to create, modify, and format and can occupy multiple pages. Typographic controls include tracking, word spacing, horizontal scaling, and baseline shift, and WorldWrite has both paragraph- and character-based style sheets. But you can define style sheets only by example (with previously formatted text), and changing a style is even more awkward.

WorldWrite's support for long and complex documents is a mixed bag. Although you can enter footnotes and endnotes in the same document, both appear confusingly as superscript numbers. You can mark items for and compile a seven-level table of contents and a two-level index, but you can't use a style to automate marking either type of entry. Indeed, WorldWrite doesn't offer much in the way of office automation: it lacks AppleScript support, wizards, templates, a macro function, and automatic cross-referencing.

WorldWrite's page-layout skills are uneven as well. The program displays pages as they will appear when printed. Behind the text is a graphics layer; text can wrap around irregularly shaped graphics at a user-defined offset. Conveniently, the program lets you create master pages for repeating text and graphics, but to suppress items you have to cover them with opaque boxes. You can't divide a document into sections or adjust hyphenation, but you can print separations with crop and separation marks and import styled text into QuarkXPress.

WorldWrite's foreign-language skills rival those of the less user-friendly Nisus Writer; with an Apple Language Kit, WorldWrite can handle right-to-left and vertical scripts. On the other hand, it can't print envelopes, and its mail-merge function might have been state-of-the-art in 1988. Its RAM and hard drive requirements are exceeded only by Microsoft Word 6's. WorldWrite also has a distressing habit of crashing from time to time.

The Last Word

WorldWrite's well-designed interface and other strengths are appealing, but its many lapses and its unreliability are not. Unless you work with alphabets other than Roman, stick with WordPerfect or MacWrite Pro.—ROBERT C. ECKHARDT

RATING: ★★/4.0 **PROS:** Clean interface; character and paragraph styles; good table tools; strong foreign-language support; master pages. **CONS:** Antediluvian mail merge; many omissions; buggy. **COMPANY:** WorldSoft (801/350-9490, *http://www.worldsoft.com*). **LIST PRICE:** $149.

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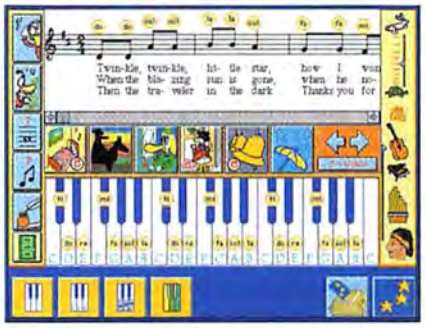
Children's Music Education

COMPETING PACKAGES ARE SHORT ON THEORY, LONG ON ENTERTAINMENT

AS A CHILD, I BECAME DISCOURAGED by a piano teacher whose unimaginative methods turned what should have been a joy into drudgery. Two new programs use engaging methods to introduce children to music with a playful touch, but neither can do the job alone.

Taking a straightforward approach, A Little Kidmusic—from Ars Nova, the maker of Practica Musica—presents a piano keyboard on screen that you can play using a MIDI keyboard or the Mac's keyboard or mouse.

A Little Kidmusic offers three different age-group settings: preschoolers, young readers, and ten-year-olds and up. All age groups can listen to and play songs, and the two older groups can learn pitch and rhythm. The writing tool—which lets you add harmony and record your own songs—is offered only for the oldest kids. You click on the appropriate icon for simulated guitar, piano, organ, and voice, and move a slider between a rabbit icon and a tortoise icon to change a song's tempo.



A Colorful Keyboard A Little Kidmusic lets you listen to, play, and record familiar children's songs from your Mac or a MIDI device.

The program's large library of melodies should be familiar to kids; my seven-year-old daughter recognized most of them immediately. Another plus is its multiuser design geared for classrooms: you can designate a file server for the program and Kids folder (which holds individual students' and teachers' files), and an access path for locating them.

Codesigned by Theatrix Interactive with the renowned Juilliard School, Juilliard Music Adventure teaches basic music concepts—including rhythm, melody, and pitch—through an interactive adventure. Game play takes you into a medieval castle whose queen is held captive by an evil gnome named Gnoise. You solve musical riddles and win keys by choosing color-coded tiles that correspond to the correct notes; you need all of them to unlock the queen's throne room and set her free. You can also bypass the game and go straight to the Rhythm and Melody tools, but once you're there, using them is not intuitive.

My daughter and I earned all the keys but one; in the dragon's lair we seemed to be one note short of the complete tune, but none of the remaining tiles worked and the program offered no hints. And although we were usually able to identify the correct tiles by color, shape, and position, that approach didn't help us identify the musical notes they represented.

The Last Word

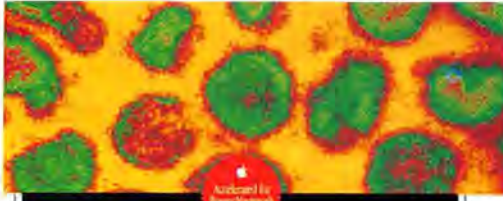
Of these two programs, A Little Kidmusic does a better job of covering the basics of music theory while maintaining a playful look that appeals to young kids. Don't expect it to teach them all they need to know about music, though; it might make a good supplement, but it won't replace formal musical instruction. Juilliard Music Adventure, on the other hand, misses the mark. Your kids may have fun with it, but they won't come away with a true understanding of music.—CATHY ABES

A Little Kidmusic

RATING: ★★★/5.3 **PROS:** Familiar songs; MIDI input and output support; multiuser design. **CONS:** Thin manual with minimal music textbook; limited range of instruments. **COMPANY:** Ars Nova (206/828-2711, *http://www.ars-nova.com*). **LIST PRICE:** $75.

Juilliard Music Adventure

RATING: ★★/4.1 **PROS:** Wide range of instruments; color tiles and program hints help kids find the right notes. **CONS:** Poor documentation; confusing composition tools; no music theory instruction. **COMPANY:** Theatrix Interactive (510/658-2800). **LIST PRICE:** $34.95.



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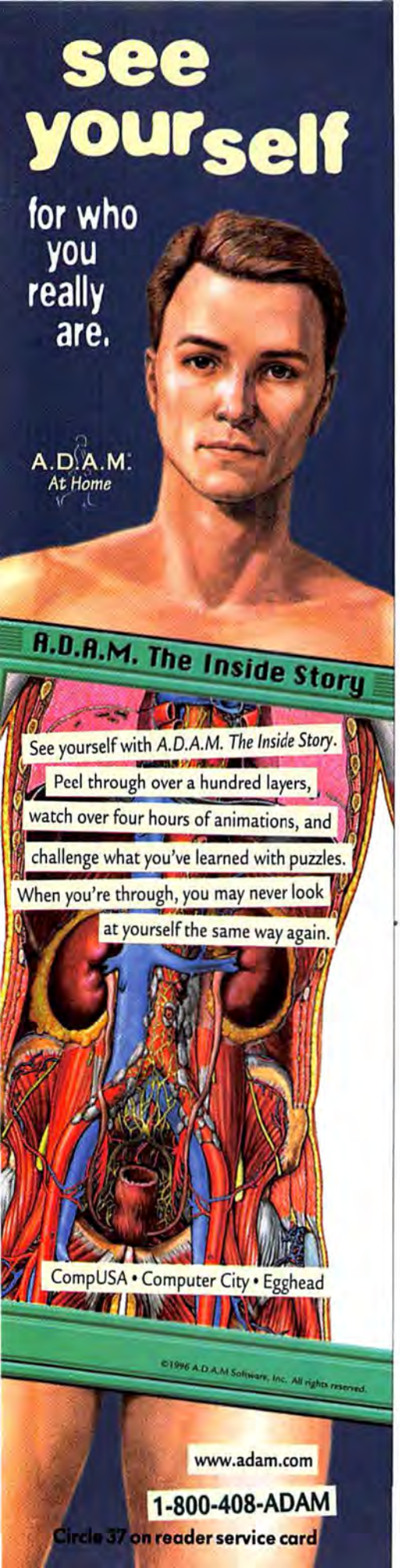
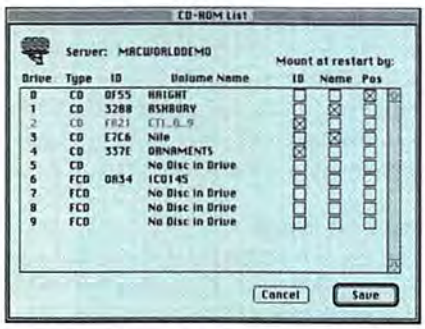


LanCD 3.2

NETWORK CD-ROM CLIENT SOFTWARE SUFFERS FROM DIFFICULT SETUP

AS A PART OF OUR DAY-TO-DAY work, *Macworld* editors frequently access Computer Select, a CD-ROM compilation of technology magazine articles. At an annual subscription cost of $1250, buying a separate copy for each staff member could wreak havoc with the editorial budget.

Adding a multiuser CD-ROM drive or jukebox to your network is an easy solution to this type of dilemma, unless you need to accommodate both Macs and PCs; most network CD-ROM systems



Drive Time Clicking on the LanCD server icon in the Chooser brings up a list of accessible CD-ROMs. Discs already mounted—like the CTI Encyclopedia on this server—are grayed out.

are Novell NetWare–based and offer limited support for Macs. Version 3.2 of Logicraft's LanCD network-access software solves the mixed-environment problem for Macs on Ethernet TCP/IP networks, complete with support for the Mac's long file names and HFS discs.

I can't say this is an easy solution, however. I was eventually able to access CD-ROMs from my Mac using LanCD, but getting to that point was a baffling, frustrating experience that involved not only ignoring but contradicting instructions in the manual.

To test the client software, I connected a Power Mac 7100 to the Logicraft Optical Storage and Retrieval System, a $20,988 Pentium-based server that incorporates six 4× CD drives and a 4.2GB hard drive. (This tower was a hassle: drive connections shook loose during shipment; easily lost ¼-inch screws hold the side panel in place; and its door opens to just shy of 90 degrees and kept banging my arm when I loaded the CD caddies.)

Installing the software took the patience of a saint and copious help from Logicraft technical support. First, the driver consistently refused to load. Next, the Network control panel had to be set to EtherTalk—simple enough. Unfortunately, in order to get the system running, I had to switch the control panel over to Ethernet (not EtherTalk) to modify the MacTCP Hosts file. The documentation insists that modifying the Hosts file is optional, and doesn't indicate what information needs to be inserted if you decide to invoke that option.

Luckily, things get easier from here. When you open the Chooser, the LanCD icon appears; clicking on it brings up a dialog box that asks you to type in the IP address of the server, which in turn leads to a dialog box where you select (or in the case of a single-server setup, verify) the file server.

Once you've selected your server, a list of the CDs loaded in the jukebox appears in order of volume name. As with any network volume, you can set the Mac to mount any or all of the CDs from the server automatically when you log on. You can determine the mounting order of a CD by its position in the server, its name, or its ID number (see "Drive Time"). In this way, you can always mount the most current version of periodical CDs (such as Computer Select) as long as the name remains the same.

The Last Word

Although I was disappointed by the contortions necessary to configure the server, it made reading CDs a dream once it was up and running. You probably won't want to tackle the daunting installation process without your network administrator, but all the CDs I tested—even home-brewed CD-R titles and a disc with no Macintosh installation instructions—played without a hitch. I even managed to run an application off a Mac-only CD, something that Logicraft doesn't recommend.—HOWARD BALDWIN

RATING: ★★★/5.2 **PROS:** Accesses network CDs as if they were in your own Mac's drive; supports long file names and HFS discs. **CONS:** Installation is a chore—keep your network expert handy. **COMPANY:** Logicraft (603/880-0300, *http://www.logicraft.com*). **LIST PRICE:** 10-user license $695; 50-user license $995.

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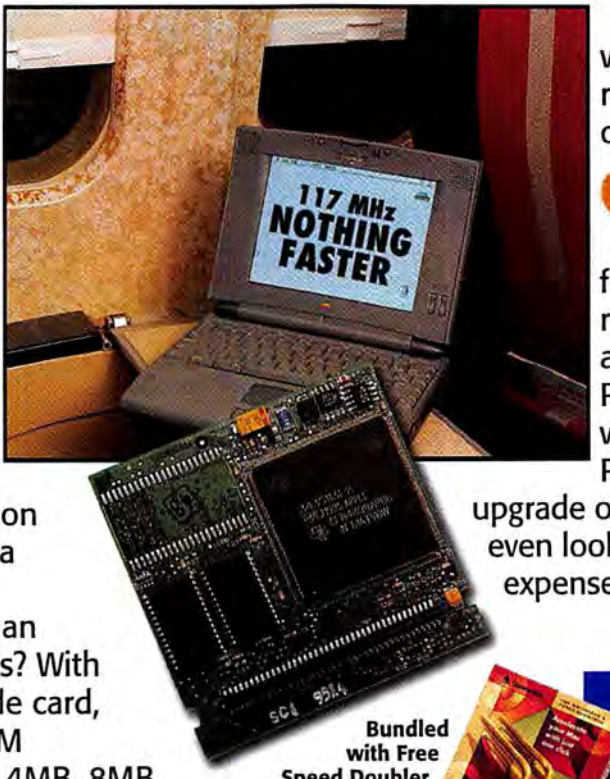

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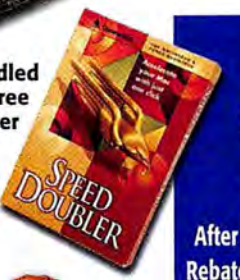

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MessagePad 130

NEWTON FINALLY DOES IT IN THE DARK

FOR MANY BUSINESSPEOPLE, THE Newton MessagePad is useful mainly as a device for scheduling, expense-report filing, and occasional note taking. But using a Newton without enough light is a strain on the eyes and sometimes is just plain impossible. With the MessagePad 130, Apple has finally fixed this problem with the obvious engineering solution: backlighting.

And it's great. Once you have the backlighting adjusted to your liking, you'll probably leave it on all the time—at least when your 130 is plugged in. Backlighting is energy intensive (the batteries run down about three times faster with it on), so the MessagePad 130 has software that lets you set backlighting on a timer. As an extra vision bonus in this model, Apple has switched to a more rugged, lower-glare surface.

Apple has recognized that personal digital assistants must have Internet and online-service access. Handling browsers for the World Wide Web and clients for America Online and CompuServe (CompuServe promises its client in May 1996) means it needs lots more memory, so the 130 has

KEVIN CANDLAND

2.5MB of RAM, enough to enable a more ambitious TCP/IP life, and 8MB of ROM that holds the expanded version of Newton Operating System 2.0.

Software tweaks include a Handwriting Instructor to help you get optimum results from the internal script recognizer (although Graffiti from Palm Computing [415/949-9560] is still a bit more accurate than the Newton's own software), and calendar/scheduling/list-management software that's a serious improvement over earlier versions. However, the interface and backup software for both Windows and Mac is essentially unchanged. The 130 includes Pocket Quicken 1.2, which you can use to generate day-by-day Quicken expense reports of deductible activities. This function alone makes the Newton worth four stars to me; it does an excellent job at many necessary business tasks.

The Last Word This is still definitely a market-niche product; if your mobile computing requirements *demand* something smaller than a PowerBook, it's the best Mac-related PDA, but it's not to be confused with a full-function computer. Backlighting may be a simple addition, but it makes a big difference in usability, since on the road means in the dark a good part of the time. The 130's standard memory is also adequate to let it function as a respectable E-mail link with standard services. This link is essential for the Newton's continued viability.—CHARLES SEITER

RATING: ★★★★/7.0 **PROS:** Lighted screen; extra memory; minor software tweaks. **CONS:** Extensive use of backlighting shortens battery life. **COMPANY:** Apple Computer (408/996-1010, *http://www.apple.com*). **LIST PRICE:** $695.

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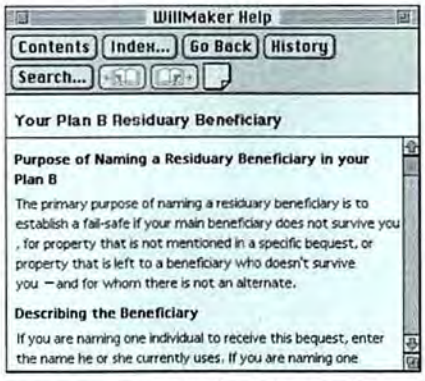
WillMaker 6.0

COMMONSENSE LEGAL GUIDE MAKES WRITING YOUR WILL EASY

CONSIDER YOURSELF FOREWARNED. With Nolo Press's WillMaker 6.0, you've run out of excuses for not writing a will, health-care directive, or final-arrangement document.

Let's start with the classic excuse, "It's too complicated." Thanks to WillMaker's easy-to-follow, personal interview format, that excuse hasn't worked in years. In WillMaker 6.0, Nolo has added an online legal manual, making the question-and-answer process even easier. Whenever you're puzzled about the ramifications of a choice, you can click on the More Information button; in a separate window, the context-sensitive legal guide offers an explanation of the subject at hand.

Unlike most legal guides, WillMaker is easy to understand and marked by the kind of commonsense advice you'd want from an attorney. For instance, you might want to have your ashes flung off the local bridge. The legal guide reminds us, however, that "there are some local laws controlling scattering that may thwart your wishes." However, the guide also adds that "in reality, these laws are very difficult to enforce if the scattering is done privately and quietly."



Lawyer in a Box WillMaker 6.0's new online legal guide offers context-sensitive help.

Next, consider the shopworn "Writing a will takes too long" excuse. WillMaker 6.0's interface improvements make the process so straightforward, I was able to complete a relatively basic will, health-care directive, and final-wishes document in less than two hours.

Expense is another habitual excuse for not writing a will. While going to an attorney might cost you thousands, WillMaker's list price has remained steady at $69.95.

While you should see a lawyer for complicated wills and documents, WillMaker 6.0's enhancements will do the job for most people. The new "pot trust" option, for instance, lets you leave property in one trust for all your children and direct a trustee to distribute the money according to each child's situation. You can now make an unlimited number of bequests. And version 6.0 lets you name coexecutors for your will.

WillMaker 6.0 could stand some tweaking. Early in the will interview process, you create a list of names (complete with contact information) for designating beneficiaries and executors. Adding a name to the list later, though, is curiously awkward, and the list is linked only to the wills component. Also, version 6.0 won't import wills created in WillMaker 5.0.

The Last Word WillMaker 6.0's inconveniences aren't major—and they certainly aren't big enough to classify as excuses. If you need to write a will, health-care directive, or final-arrangement document, WillMaker is an easy, straightforward way to get the job done.—JAMES A. MARTIN

RATING: ★★★★/8.1 **PROS:** Straightforward; excellent online help. **CONS:** Can't convert WillMaker 5.0 wills; name list linked only to wills. **COMPANY:** Nolo Press (510/549-1976, *http://www.nolo.com*). **LIST PRICE:** $69.95.

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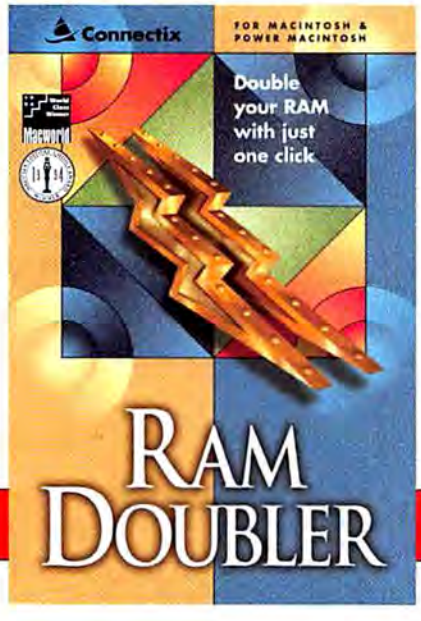

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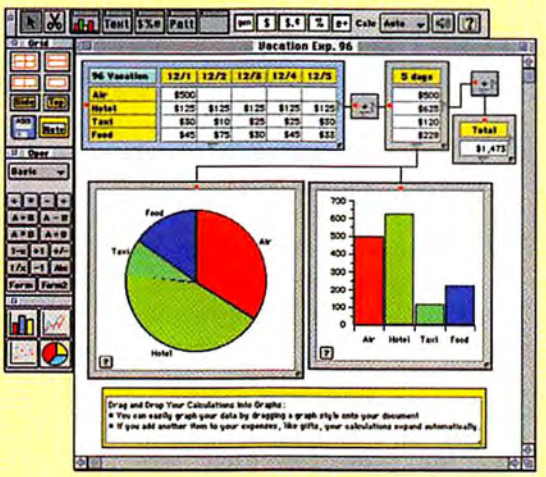

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Bartlett's Familiar Quotations

CD-ROM PROVES YOU *CAN* TEACH AN OLD REFERENCE NEW TRICKS

BY NECESSITY, BY PROCLIVITY, AND by delight, we all quote" (Ralph Waldo Emerson, 1876), and Bartlett's Familiar Quotations, Expanded Multimedia Edition, makes finding good quotations a whole lot easier.

Containing all 20,000-plus quotations from the 16th edition of the familiar reference, Bartlett's sports an elegant, easy-to-read design. The entry point is the Quotations window, which displays a column of chronologically arranged quotes and an alphabetical list of more than 2500 authors (see "You Can Quote Me").

The Media Timeline window lists more than 400 images, plus sound and video clips, also in chronological order. You can zero in on a date or just scroll up or down the years. Click on any thumbnail to see a full-screen (occasionally muddy) image, listen to a speech or music clip, or watch a video.

The Select Quotations window is the primary search area. Here you can specify a topic, author, keyword, original source, and date. The program displays the quotations it finds and marks them; however, it doesn't highlight words found in keyword searches, nor does it tell you how many quotations it has located (to help you decide whether to narrow the search). If you want to do a Boolean search (to find both *king* and *queen* in the same quotation, for example), search titles by something other than the exact title, or search for several specific dates, you must use the Quotations window's Find command, which can locate only one quotation at a time. And search results can be unreliable: a source search for *Wizard of Oz, The Wonderful* came up empty-handed even though there were in fact three qualifying quotations from the book, and a Find for the year 1542 turned up Sir Walter Raleigh, who wasn't born until 1552.

You Can Quote Me Casual browsers can scroll through Bartlett's Familiar Quotations or type part or all of a name to jump to a specific author.

Although the program ran extremely fast on my Power Mac 7500, it gobbled up an extravagant 6.6MB of hard-drive space. I'm also unimpressed by the awkward, non-Mac–style scroll bars; the grayed-out list items that can in fact be selected; and Bartlett's tendency to make the menu bar disappear if you fail to use the Hide button.

The Last Word The multimedia edition of Bartlett's Familiar Quotations is more efficient and easier to use than the version Winston Churchill called "an admirable work." I do hope the publisher will clean up the program's flaws; in the meantime, we can still enjoy better access to the contents of this classic reference than we've ever had before.—ROBERT C. ECKHARDT

RATING: ★★★/6.8 **PROS:** Fast; both browsable and searchable. **CONS:** Awkward, unreliable search engine; inconvenient, nonstandard interface elements. **COMPANY:** Time Warner Electronic Publishing (212/522-0680, *http://pathfinder.com/twep/products/*). **COMPANY'S ESTIMATED PRICE:** $39.95.

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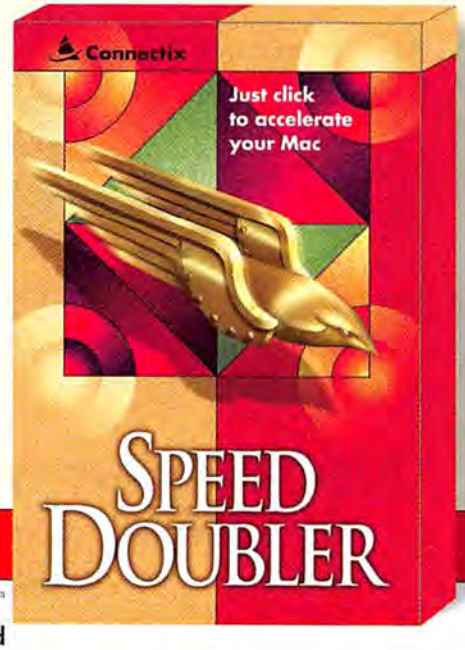

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Dramatica Writer's Dream Kit 1.7

POWERFUL WRITER-ASSISTANCE SOFTWARE REFINES YOUR FICTION

SCREENPLAY SYSTEMS' DRAMATICA Writer's Dream Kit gives writers feedback and direction while they flesh out a story idea. If you provide the tale, Dream Kit will help you bulletproof it, through an amazing software-driven short course in narrative theory.

Dramatica's well-written documentation breaks creative writing into three phases: Storyforming, defining theme and conflict; Storyencoding, explaining character motivation and plot points; and Storyweaving, sketching out actual scenes. The software guides you through the first two phases but strangely leaves you to fill out paper forms—by hand—in the final phase.

Seven buttons on Dream Kit's main screen access its helpful tools, including the Query System, a database of story structures; the Theory Guide, an online help system about story concepts; the Story Engine, a single-page form to track your story's main elements; the Characters tool; and the Reports, text files based on your input.

Dream Kit's powerful Query System uses the Socratic method, asking you multiple-choice and short-essay questions to push you down the creative road. You start with 32,768 possible story structures. Answering somewhat abstract questions, such as, "In your story do: actions force decisions or decisions force actions?" helps you narrow your story down to a single structure. I was both annoyed and enlightened by the unusual approach. Dream Kit forces you to consider your story from a fundamental narrative level and makes you think more, not less, about what you write.

Finding the Deep Structure The Dramatica theory explains the concepts of themes and motivations.

Clicking through the questions is easy, and Dream Kit supplies helpful definitions, theory explanations, and specific examples from ten famous works, including *Hamlet* and *Star Wars*. After 12 initial questions, Dream Kit generates a series of reports on characters, plot, and themes, which you can print or export to text files. Dream Kit modifies the reports on the fly when you make changes. As you continue with 50 follow-up short-essay questions, Dream Kit adds your input to the reports.

Dream Kit has some drawbacks. Handwriting the forms for the final story-weaving phase is annoying. The database of story structures is versatile but generic, and can leave you staring at puzzling feedback.

The Last Word Nonetheless, Dream Kit blows away the competition in price and power. Most writer-assistance software is $300 or more, but Dream Kit delivers for an affordable $149. And it takes much less time to use than getting a master's degree in creative writing.—DEAN ANDREWS

RATING: ★★★/6.9 **PROS:** Powerful query engine; low price; easy to learn and use. **CONS:** Software assistance ends too early; reports can be too abstract. **COMPANY:** Screenplay Systems (818/843-6557, *http://www.well.com/user/dramatic/*). **LIST PRICE:** $149.

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College Advisor

HELP WITH ONE OF LIFE'S BIG CHOICES

CHOOSING A COLLEGE ISN'T EASY. The choice has lifelong consequences, and the number of options can be overwhelming. The Princeton Review's College Advisor presents information from *The Guide to the Best 309 Colleges*, *The Big Book of Colleges*, and *The Guide to Paying for College* on a CD-ROM, making it easier to select a school and to map out a strategy for getting there.

A cartoonish counselor's office contains clickable items that open different modules of the program. Some of the picture links have obvious meanings—a computer with "Help" scrawled on the screen provides assistance—but others are less clear. Fortunately, a live-action college admissions counselor guides you through the program.

You click on the picture of the wizard to start your interview, where you answer a series of questions about yourself, your academic history, and the criteria important to you in your college choice (see "The Wizard's Interview"). Based on your answers, the program calculates your numerical "competitiveness rating," which is used with your answers to questions about college criteria to generate a "hot list" of likely colleges. You can read about the recommended schools by clicking on their names. Many schools' listings include subjective opinions written by actual students to supplement the hard data.

The Wizard's Interview The admissions wizard assesses your competitiveness rating and compiles a list of schools that meet your needs.

If you're serious about a school, you'll want more information—and more current information—than a CD-ROM can provide. College Advisor comes with Netscape Navigator and Internet access software, so you can jump directly to the Web pages of schools that interest you. (If you already have Web access, the program works with most service providers.)

You can delete schools from your hot list and add schools not originally chosen by the program. A search tool allows you to find additional schools by specifying matching criteria. You can also browse the complete alphabetical list, comparing your competitiveness rating with selected schools.

Of course, choosing a college is just one step in the complex process of preparing for a college education. The road-map module walks you through the complete process, starting in your junior year of high school. Each step is clearly explained, and the program allows you to record your progress.

The Last Word As a high school senior and his father, we've been working our way down the college-selection path using the traditional methods: books and hearsay. This program could have saved us lots of time and effort if it had been available a year earlier. A good deal of CD-ROM software seems overpriced when compared with books and other information sources. Priced under $20, College Advisor is a tremendous bargain.—GEORGE AND BEN BEEKMAN

RATING: ★★★★/7.1 **PROS:** Inexpensive; useful information; direct Internet access. **CONS:** Juvenile and slightly confusing interface. **COMPANY:** Princeton Review Publishing (617/272-7027, *http://www.review.com*). **LIST PRICE:** $19.95.

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Final Effects AP

ADD COOL VIDEO EFFECTS TO ADOBE PREMIERE

METATOOLS' FINAL EFFECTS AP is set to do for Adobe Premiere what its KPT Final Effects did for Adobe After Effects—for hundreds of dollars less. Final Effects AP is a collection of 16 transition and filter plug-ins for Premiere, the most popular video-editing program in the Macintosh world. (It also works with programs that fully support Premiere plug-ins.)

Final Effects AP's modules install in Premiere's plug-ins folder and weave themselves into the Premiere interface. You get four transition effects: two wipes stretch the video in track A while gradually revealing the video in track B; another twists track A like a piece of toffee while revealing track B; and the fourth peels away track A to reveal track B. Not only is this page peel much more attractive than Premiere's, but it lets you specify more peel directions.

The 12 filters in Final Effects AP distort video tracks and add other special effects. The Rain and Snow filters simulate precipitation; the Sphere filter projects an image onto a sphere whose surface properties and illumination you control; the Scatterize filter creates an exploding image; the Flo Motion filter sucks images into a digital black hole; the Pixel Polly filter creates a shattering-glass effect; and a sophisticated particle generator creates everything from starbursts to bubbles to flames. You can also animate the effects over time by creating keyframes in the filter's dialog box (see "Premiere Effects"). With the snow filter, for example, you can create gentle flurries that evolve into a windblown blizzard.

Premiere Effects Final Effects AP's filter dialog boxes let you change the way a filter is applied over time. Here, I added a keyframe that will change the direction of the raindrops.

One of the beauties of Adobe After Effects is the control it gives you over effects: you can specify numeric values for filter settings, for example, and adjust the way a filter evolves by drawing Bézier curves. This control extends to third-party modules like KPT Final Effects. Because Adobe Premiere doesn't provide this fine control, neither does Final Effects AP. However, you can specify that an effect evolve in a linear fashion or begin and end gradually, or you can use the Bézier option to create a less dramatic effect (though you can't edit the curve as in After Effects).

The Last Word With Final Effects AP, MetaTools has made the renowned image quality of KPT Final Effects accessible to Premiere users. If you do most of your work in Adobe Premiere or a program that's compatible with Premiere plug-ins—and you can't justify the expense of After Effects and KPT Final Effects—you won't find a higher-quality collection of transitions and filters for your money.—JIM HEID

RATING: ★★★★/8.3 **PROS:** Excellent rendering quality; well integrated into Premiere; useful effects. **CONS:** No numeric control over effects parameters. **COMPANY:** MetaTools (805/566-6200, *http://www.metatools.com*). **LIST PRICE:** $199.

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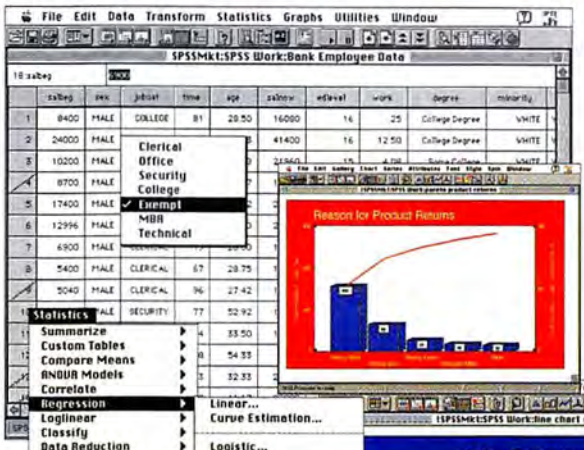

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KPT Cool Effects

"KAI'S POWER TOOLS LITE" AT A BARGAIN PRICE

MAYBE YOU DON'T CONSIDER yourself enough of an image-editing power user to justify a $199 investment in Kai's Power Tools 3.0. If you work with any digital photography at all, however, you owe it to yourself to check out MetaTools' KPT Cool Effects. This collection of 21 filters from Kai's Power Tools 2.1 is designed to complement Adobe's consumer-oriented PhotoDeluxe (see *Reviews*, April 1996), which already includes 5 KPT Cool Effects filters. Nevertheless, these plug-ins are also fully compatible with Adobe Photoshop.

KPT Cool Effects is like background music for your digital photographs. Even if you have little technical knowledge, you can give your images dramatically different moods by applying various filters. With just a few mouse-clicks, for example, I gave a photo of a vintage Corvette a soft, warm look (with Gaussian Glow) and then a highly charged look (Gaussian Electrify) before settling on a somewhat tattered look (Gaussian Weave). Creating a sense of motion was easy with Pixelbreeze (see "The Pixelbreeze in Your Hair"), though I could also have applied Pixelwind or Pixelstorm.

The Pixelbreeze in Your Hair KPT Cool Effects' Pixelbreeze option, applied to the right half of this image, gives the illusion of motion.

A few Cool Effects are almost applications in themselves. The most useful of these extensions, Gradient Designer, lets you create an infinite number of custom fills and apply them to any selected area of your image (though I found it most suitable for text). When I was creating some artwork for an Internet company, for example, I used Gradient Designer to give the text a metallic look. Had I been working on a piece for an antique store, I could have chosen a wood-grain fill. Gradient Designer comes with more than 200 predefined fills, and you can create and save new ones to use later on other images.

Not every Cool Effect will make your A-list. I found 3D Stereo Noise to be one of the less appealing filters; it supposedly converts your image into one of those 3-D stereograms that make you cross-eyed trying to find the hidden image. I've never been able to see those images in the first place, so I can't attest to this filter's effectiveness. Even if it works flawlessly, though, I can't see myself ever using it.

The Last Word By simply repackaging an old version of an existing product, MetaTools won't win any awards for originality. On the other hand, offering some of the best of Kai's Power Tools at a fraction of the cost scores high on the bang-for-your-buck scale. If you don't own Kai's Power Tools, KPT Cool Effects is definitely worth the $29. Just be aware that the documentation, already on the sparse side, is written for PhotoDeluxe users.—JOHN SAN FILIPPO

RATING: ★★★/6.9 **PROS:** Useful, professional-quality image-editing tools; inexpensive. **CONS:** Documentation is light and geared toward PhotoDeluxe users. **COMPANY:** MetaTools (805/566-6200, *http://www.metatools.com*). **LIST PRICE:** $29.

Connections

IDEAS AND ENTERTAINMENT LINK UP

JAMES BURKE HAS MADE A CAREER of showing us how seemingly unrelated ideas are interconnected throughout history. In his lively television programs he follows convoluted paths to show, for example, how a chain of unlikely events led from the invention of carbon paper to today's television sets. Over the years Burke has spun a gigantic web of interrelated ideas—a web that seems an ideal candidate for an interactive multimedia exposition. We can envision spending hours following our curiosity through a hypermedia reference featuring clips from the *Connections* TV series.

The Connections CD-ROM isn't a hypermedia reference, though; it's an exploratory adventure in the tradition of Myst. When you launch the program, you find yourself stranded in a visually rich 3-D environment. As you navigate this artificial world, you gradually discover clues that help you understand your goal: to battle the forces of chaos and save the universe by uncovering hidden links in history.

The comic-book plot seems a bit silly, but it's an interesting device for tying together dozens of perplexing puzzles and logic conundrums with snapshots of the history of ideas. As you explore Connections, time and space are twisted so that nearly every scene is filled with anachronisms. Early in the game you visit a medieval pharmacy next door to a television repair shop; both stores offer the tools and clues you need to help James Watt invent the piston (see "Watt's Up?").

Watt's Up? You need to help James Watt solve a problem with his piston before you can add another link to your chain of ideas.

The pharmacist, the TV repairer, James Watt, and other characters are played by live actors who are smoothly integrated into the artificial landscape. The acting is sometimes corny and distracting; the most satisfying character is Burke himself, who pops up occasionally to comment on your progress. Burke also appears in fascinating video segments that explain the historical connections between the objects you uncover on your journey. Each key object forms another link in a chain of ideas; completing the chain advances you to the next level—and a new set of puzzles.

A number of the puzzles seem obscure and nearly impossible to solve without help. Fortunately, assistance is always just a mouse-click away. A generous hint can almost always get you out of trouble, even if you're a puzzle-game novice. (If you lack willpower, you can disable the hint option at the beginning of the game.)

The Last Word As an interactive story, Connections doesn't hold a candle to the best of the genre, and it isn't the best choice if you're looking for an educational tutorial. But Connections does an admirable job of bridging the worlds of ideas and entertainment.—GEORGE AND BEN BEEKMAN

RATING: ★★★★/7.2 **PROS:** Frequently challenging; hint system included; informative video clips. **CONS:** Weak story line; some puzzles are frustrating and obscure. **COMPANY:** Discovery Channel Multimedia (301/986-0444, *http://www.discovery.com*). **LIST PRICE:** $49.95.

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The Mac's 3-D Edge

QuickDraw 3D will change how you create graphics, play games, and surf the Web

THE MAC OS HAS ENTERED THE THIRD DIMENSION.

Apple's QuickDraw 3D technology promises to do for 3-D what QuickTime did for video—make it ubiquitous, consistent, and available not only to a small group of specialists, but to everyone.

For artists, designers, and engineers, QuickDraw 3D promises faster, easier-to-use 3-D modeling, rendering, and computer-aided design (CAD) programs. For World Wide Web surfers, QuickDraw 3D may lead to 3-D Web sites that provide richer details than found in today's 3-D sites. For thrill seekers, QuickDraw 3D enables games that can induce motion sickness. For publishers, QuickDraw 3D makes possible a new breed of clip art that lets you change viewing angles, textures, and lighting. Finally, for anyone curious about computer graphics, QuickDraw 3D makes it easy and inexpensive to test the waters of high-octane 3-D.

QuickDraw 3D isn't an application program. It's a system extension that lays a foundation upon which software developers can build software with 3-D graphics features. QuickDraw 3D works on any PowerPC-equipped Mac, including 680X0 models containing PowerPC upgrade cards. (QuickDraw 3D will not run on straight 680X0 Macs.) The software requires System 7.1.2 or later and at least 16MB of memory. As I'll describe below, a version for Microsoft Windows is scheduled to be available by the time you read this.

Today, QuickDraw 3D is in its primordial phase: developer support is spotty and even erratic. But support is building steadily, and no one is questioning QuickDraw 3D's future—every developer I talked to praised the technology and hailed Apple's efforts to release it for both Mac and Windows platforms.

In this technology overview, I detail QuickDraw 3D's benefits and the state of QuickDraw 3D support today. I also describe some QuickDraw 3D accelerator cards that promise to boost performance and add imaging features. Macworld Lab tested three currently shipping cards and found that QuickDraw 3D acceleration hasn't yet reached its stride

MW LAB

BY JIM HEID

JAVIER ROCA

(see the sidebar "QuickDraw 3D Accelerators: Not So Quick on the Draw").

What QuickDraw 3D Promises

Outstanding 3-D programs have been available for the Macintosh for years—so who needs a system extension for 3-D? To answer that, let's look at the state of 3-D today and at how QuickDraw 3D promises to change it.

A Standard File Format Every 3-D program uses its own file format, and exchanging 3-D scenes and models is cumbersome at best. Most 3-D programs support a cross-platform interchange format called DXF (short for Drawing Interchange File), but the DXF specification is designed to be a least-common-denominator format: it preserves only model shapes, not appearances. QuickDraw 3D provides a standard file format, called 3DMF (short for 3-D metafile), that can describe all aspects of an object or scene: its components, lighting, texture maps, cameras, and so on (for definitions of these and other 3-D terms, see the diagram "Apple's Standards Make 3-D Graphics Simpler"). 3DMF files also tend to be much smaller than their DXF counterparts—an attribute that Apple is hoping will help make 3DMF a standard format for the World Wide Web.

QuickDraw 3D's 3DMF support extends to the Clipboard and Scrapbook, letting you cut and paste—even drag and drop—models between QuickDraw 3D programs.

System-Level Rendering Every 3-D program must contain its own software for rendering (the time-intensive process of adding shading, textures, and lighting to a scene). QuickDraw 3D provides a system-level renderer—and one that works in real time, at that. QuickDraw 3D's stock renderer doesn't provide the kind of photo-realistic rendering required by 3-D professionals, but it's adequate for games, CAD software, and draft views of scenes.

And QuickDraw 3D's rendering features are extensible: you can add more-sophisticated types of rendering with third-party renderers. A new renderer is available for any program that uses QuickDraw 3D to render. I'll detail more aspects of QuickDraw 3D's extensibility later.

A Standard User Interface Every 3-D program provides its own user interface for manipulating objects: rotating them, resizing them, and moving them within a scene. Letting users easily manipulate three-dimensional objects that appear on a two-dimensional screen requires creative user-interface design—and some developers are more creative than others.

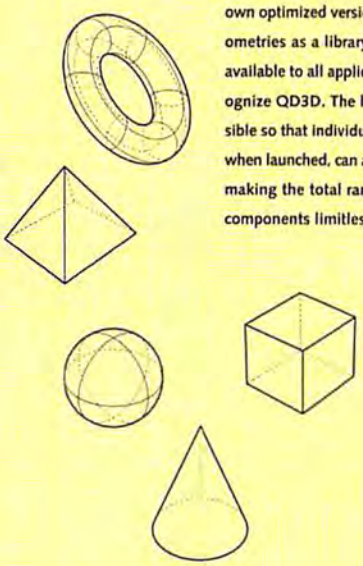
QuickDraw 3D provides standard controls for object manipulation, and a few minutes with a program that uses these controls are all it takes to appreciate Apple's interface-design

Apple's Standards Make 3-D Graphics

Three-dimensional computer graphics have always lacked the consistency and system support of their close cousins, 2-D graphics, which have the benefit of a cross-application clipboard, consistent text editing, and standard formats (PostScript and PICT). Apple took a close look at what's involved in creating and using 3-D images and established standard ways to increase consistency and ease of use for both the programmer and the user. These standards fall into four key areas: creating, manipulating, viewing, and file formats.

Creating: The Building Blocks of 3-D

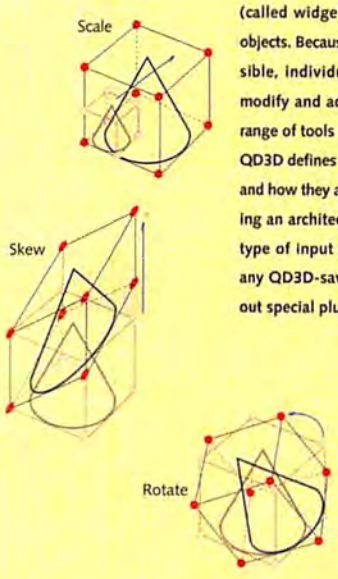
All 3-D images are made up of models (objects). These objects—spheres, cubes, cylinders, and more-complex shapes—need a defining structure, or geometry. Geometries are the building blocks of any 3-D image. Currently, 3-D applications use proprietary definitions for their geometries.



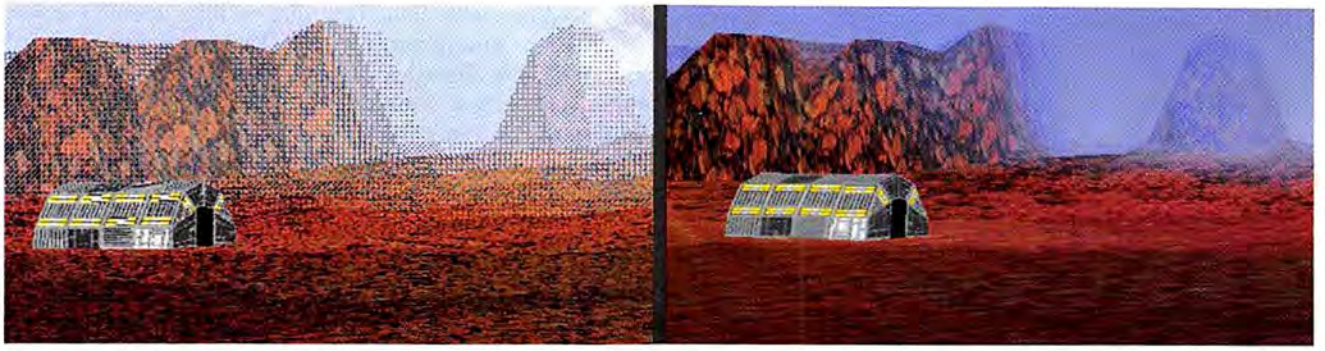
QuickDraw 3D (QD3D) provides its own optimized versions of basic geometries as a library in the system available to all applications that recognize QD3D. The library is extensible so that individual applications, when launched, can add geometries, making the total range of possible components limitless.

Manipulating: Shaping the Image

Once you've created a 3-D object, you need tools to edit the object (for scaling, skewing, reshaping, rotating, and moving). Currently, these tools vary a great deal from application to application.



QD3D provides a basic set of tools (called widgets) for manipulating objects. Because the tools are extensible, individual applications can modify and add tools, making the range of tools limitless. In addition, QD3D defines how tools are written and how they are to be used, providing an architecture that allows any type of input device to work with any QD3D-savvy application without special plug-ins.



Are You Game for QuickDraw 3D? QuickDraw 3D will lead to a new generation of games and multimedia titles that incorporate 3-D scenes and models. Reality Bytes' Havoc is the first of this new breed. Havoc takes advantage of a QuickDraw 3D–accelerator card to display more-detailed scenes and more-realistic objects. Left: Havoc without a QuickDraw 3D accelerator. Right: Havoc running with an Apple QuickDraw 3D Accelerator Card installed. Note the finer details in the ground and building, and the fog shrouding the distant mountains. As you zoom through Havoc's 3-D–accelerated world, distant objects fade into view—the effect is dramatic.

prowess (see the annotated screen shot "Exploring the QuickDraw 3D User Interface").

Built-in 3-D Functions Any 3-D image is built from a set of geometric shapes—lines, triangles, polygons, cubes, and so on—called *geometries*. In the pre–QuickDraw 3D world, developers had to write their own 3-D geometry libraries. QuickDraw 3D provides an expandable library of a dozen geometries, eliminating the need for developers to create their own 3-D engines.

In a related vein, QuickDraw 3D provides four types of lights for illuminating a scene (again, see "Apple's Standards Make 3-D Graphics Simpler"). And thanks to QuickDraw 3D's interactive renderer, positioning lights is far easier than in most 3-D programs: as you reposition a light, you immediately see the effects.

QuickDraw 3D's built-in geometries, lights, and rendering features all have the same benefit: they eliminate the need for software developers to invent these low-level wheels, freeing them to concentrate on creating the features that differentiate their products.

At least that's the promise. The reality is that developers who are already shipping 3-D products must adapt their programs to exploit QuickDraw 3D's innovations. This process is a multistep one, and most developers have taken only the first step.

What QuickDraw 3D Delivers Now

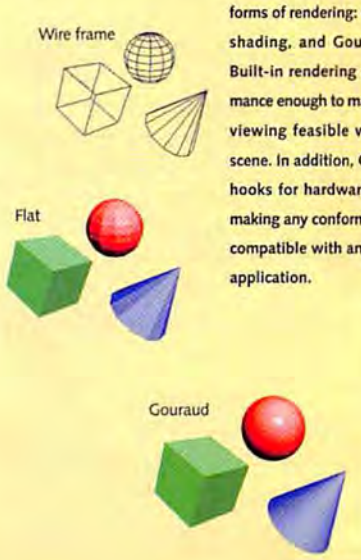
Apple has encouraged 3-D software developers to follow a multistep road map to supporting QuickDraw 3D.

3DMF Support The first and easiest phase is to add support for the 3DMF file format. This lets a program swap 3DMF models with other programs. Many major 3-D and CAD programs have already been revised to support

Simpler

Viewing: Bringing 3-D to Life

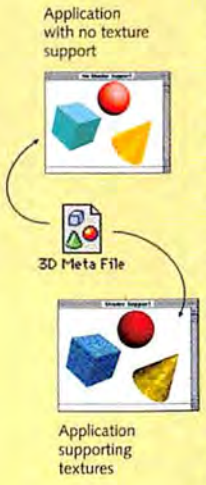
To work on an image, you must be able to view it. Current methods for displaying images vary greatly among 3-D applications. Wire-frame views are useful because of their quick display performance, even when a shaded view would be better.



QD3D builds in three standard forms of rendering: wire-frame, flat shading, and Gouraud shading. Built-in rendering speeds performance enough to make shaded previewing feasible while editing a scene. In addition, QD3D provides hooks for hardware accelerators, making any conforming accelerator compatible with any QD3D-savvy application.

File Formats: Exchanging and Saving 3-D

File formats are proprietary in many programs. Since cross-application formats support only limited amounts of image information, sharing images across applications is difficult if not impossible.



QD3D defines a new file format, 3-D metafile (3DMF), which supports all aspects of a 3-D image (structure, appearance, and custom information such as sounds). Any QD3D-savvy application can open a 3DMF file, regardless of the application's ability to work with all the file's features. For example, an application that doesn't support shaders would not display them but would still display the geometry. Another application might substitute a different shader—similar to how publishing programs substitute fonts. But even when you edit and resave a file from such an application, all the features of the file get saved, including what could not be shown in the application.

3DMF. Macromedia Director 5.0 supports it, too, making it possible for multimedia developers to add 3-D models to their titles. (QuickDraw 3D's cross-platform personality is an important advantage here: it lets title developers use one type of 3-D model on both Macintosh and Windows platforms—just as they can use QuickTime movies on both.)

The quality of 3DMF support varies, however. For example, Strata StudioPro Blitz 1.75+ creates 3DMF files that are more complex than they need be—what could be described as one vertex, for example, gets described as three vertices and a matrix. This makes Strata's 3DMF files larger (a 429K 3DMF file ballooned to 1.2MB in one of my tests) and slower to work with. What's more, StudioPro Blitz doesn't support NURBS (nonuniform rational B-splines, a method of representing complex, curved objects), complicating accurate file exchange with programs that do.

This example illustrates that file-exchange woes can

QuickDraw 3D Accelerators: Not So Quick on the Draw

Displaying 3-D scenes is hard work for a general-purpose processor like the PowerPC, and it helps to have a specialist chip in. Not surprisingly, several companies have designed chips that are tuned for the calculations required by 3-D software. And several hardware developers are now or will soon be shipping QuickDraw 3D accelerator cards that use these 3-D chips.

QuickDraw 3D is designed to automatically support 3-D–accelerator hardware. Adding a QuickDraw 3D accelerator provides three key benefits.

- First, there's faster overall performance: models rotate and resize faster, animations are smoother—the third dimension just feels more responsive.
- Second, an accelerator lets QuickDraw 3D provide transparency—this makes it possible to render objects such as bubbles and glasses, and in games it enables effects such as fog, smoke, and explosions. Apple chose not to support software-only transparency in QuickDraw 3D, citing the slow performance that would result.
- Finally, a 3-D accelerator lets games and multimedia titles use higher-quality, more-realistic images: superior lighting effects, antialiased (smoothed) shape edges, and higher-resolution texture mapping. This is beautifully illustrated in the first QuickDraw 3D–savvy game, Reality Bytes' (617/621-2500, *http://www.realbytes.com*; $39) Havoc (see the screen shot "Are You Game for QuickDraw 3D?").

Havoc takes advantage of a QuickDraw 3D layer called Rave. Short for Rendering Acceleration Virtual Engine, Rave lets game developers access QuickDraw 3D hardware accelerators while retaining their existing 3-D engines. The latter is important because 3-D game engines are finely tuned for a particular game's relatively limited requirements, and thus can deliver faster performance than a general-purpose engine such as QuickDraw 3D's.

The First Cards Macworld Lab tested the first PCI-based QuickDraw 3D accelerators: Yarc Systems' Screamer (805/499-9444, *http://www.yarc.com*; $995), Apple's QuickDraw 3D Accelerator Card (408/996-1010, *http://www.info.apple.com*; $400), and the Matrox's MGA Millennium (514/685-2630, *http://www.matrox.com*; $649).

Yarc's Screamer made us do just that—its performance was poor and it crashed frequently. The Screamer uses a 3Dlabs Glint 300SX processor, which does not accelerate texture mapping. In fact, in our texture-mapping test, a Power Mac 8500 was slower with the card than without it. Although some units are still available, Yarc has withdrawn this card from the market, and is developing a new card based on the Glint 500TX processor.

Apple's QuickDraw 3D Accelerator Card delivered much better performance. Apple designed its own accelerator chip for its card, which also supports multiprocessing—install two cards, and they work together to boost performance even more. Another plus: if you have multiple monitors, the card accelerates 3-D for all of them.

While QuickDraw 3D accelerators as a class leave much to be desired, Apple's inexpensive card is a good choice.

The Matrox MGA Millennium card—a video-display acceleration card that also accelerates 3-D—provided performance gains of 10 to 20 percent, but it introduced some rendering artifacts and does not support texture mapping. It's hard to recommend it as a QuickDraw 3D accelerator.

The Next Generation The 3-D–accelerator picture will get brighter. Not only is Yarc working on a new card, but other companies are preparing cards of their own.

ATI Technologies (905/882-2600, *http://www.atitech.com*) will announce a family of 3-D–accelerated PCI video cards this summer. The cards will be designed and priced for the game and multimedia consumer markets and will use ATI's 3D Rage, a custom chip that supports not only QuickDraw 3D and Microsoft's Direct3D, but also full-screen MPEG video playback. 3D Rage supports texture mapping, antialiasing, alpha channels, and special transparency effects. ATI also plans to sell 3D Rage chips to other board manufacturers.

Diamond Multimedia (408/325-7000, *http://www.diamondmm.com*) is developing a card that should be appealing for gamesters. The as-yet-unnamed accelerator will work with a Mac's existing video circuitry. It's slated to ship this fall at a price "well under

PAUL FRANZ-MOORE

plague 3DMF just as easily as they do Encapsulated PostScript. We can only hope that, over time, developers will get better at writing 3DMF files that swap smoothly.

Interactive Rendering The second phase of QuickDraw 3D support involves interactive rendering. Supporting the interactive renderer not only lets a program provide fast 3-D rendering, but also automatically lets the program take advantage of any QuickDraw 3D accelerator cards that you have.

A developer can add support for interactive rendering without having to rewrite its application program's internal 3-D engine or adopt the QuickDraw 3D geometries. Several programs currently support interactive rendering: Specular's Infini-D 3.1 (413/253-3199, *http://www.specular.com*; $899), Strata StudioPro Blitz 1.75+ (801/628-5218, *http://www.strata3d.com*; $1495), and Microspot's 3-D World (408/253-2000, *http://microspot.inter.net.microspot/*; $139). Many developers plan to support it in future versions of their wares.

$200," according to Diamond.

Newer Technologies' (316/685-4904, *http://www.newertech.com*) RenderPix family of high-end cards will use 3Dlabs' chips in a variety of configurations. Cards containing one or two Glint 300SX or 500TX chips will be offered; the TX is a newer chip that provides accelerated texture mapping. Scheduled to be available by the time you read this, the cards will also support daughtercards that provide up to 6MB of additional video memory. The cards are unique in that, when fully stocked with RAM, they support 24-bit color on monitor resolutions as high as 1600 by 1200 pixels.

Newer plans to ship PCI cards as well as Processor Direct Slot (PDS) cards for the first-generation Power Macs, the Power Computing Power 100 and 120, and the Radius clones. Engineers at Newer say the PCI versions will provide better performance; the Glint chips are optimized for the PCI bus, and the PCI-to-PDS logic translations slow things down slightly.

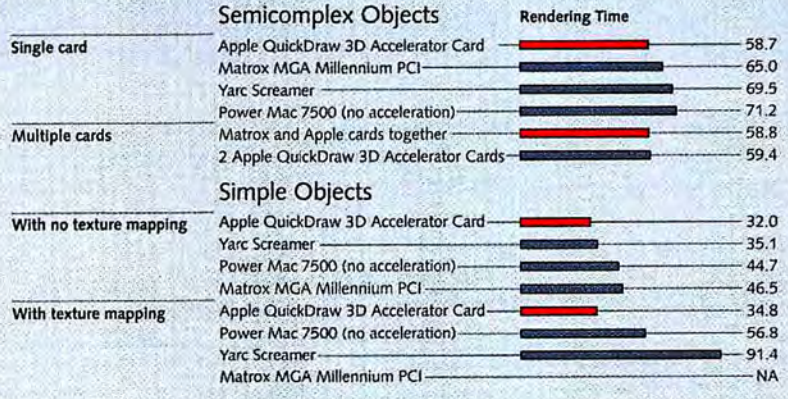
By this fall, then, expect to see QuickDraw 3D accelerators aimed at everyone from gamesters to multimedia developers. If software developers deliver, there will be good reasons to buy these cards. And this will lead to the next step: building 3-D acceleration directly into the computer. Look for this to happen, experts say, within two years.

MW LAB

First QuickDraw 3D Cards Disappoint

Surprisingly, the first generation of QuickDraw 3D accelerator cards doesn't do all that much to accelerate QuickDraw 3D rendering for shading and texture mapping. The fastest card is the cheapest: Apple's $400 QuickDraw 3D Accelerator Card was about 18 percent faster for semicomplex objects and 28 to 39 percent faster for simple objects, compared with an unaccelerated Mac. Other results were downright discouraging: the $995 Yarc Screamer (which has now been discontinued) barely edged out having no card at all for the semicomplex objects, was a respectable 21 percent faster for simple objects, but was far slower than no card when texture mapping was added. The $649 Matrox Millennium PCI was similarly mixed in its performance.

Best result in test. Products are listed from fastest to slowest. Times are in seconds. Shorter bars are better.



NA = Does not support textures; card is designed for use with 3-D modelers and Web publishing, not for games or animation.

Behind Our Tests

To test 3-D acceleration of QuickDraw 3D cards, we used Microspot's 3D World 1.0 to create a series of 3-D images that we then rendered using a Power Mac 7500/100 with a 17-inch monitor running at 832-by-624-pixel resolution and 16-bit color depth. The five semicomplex objects, including jet planes and a teapot, had 5740 faces, while the five simple objects, including cones and a sphere, had 3393 faces. We tested real-time Gouraud-shading performance on all the objects, and we also tested texture-mapping performance on the simple objects.—**Macworld Lab testing supervised by Danny Lee**

Full Adoption The most thorough QuickDraw 3D support involves not only adopting 3DMF support and the QuickDraw 3D geometries, but actually writing the entire program around QuickDraw 3D—technically, adopting the QuickDraw 3D application programming interface (API). This degree of QuickDraw 3D support applies primarily to 3-D modeling and CAD programs; game developers are most interested in using QuickDraw 3D for hardware acceleration.

Among currently shipping 3-D modeling programs, Microspot's 3-D World is the only completely QuickDraw 3D–savvy program. As a 3-D modeler, it's a lightweight, lacking animation features and advanced modeling tools. But it's a powerful argument for building a program around QuickDraw 3D: 3-D World is fast, clean, straightforward, and fun to use. And with a street price of under $100—about a fifth of what a heavyweight 3-D package costs—it's a terrific way to experiment with 3-D. (You can download a trial version from *ftp://microspot.inter.net/pub/microspot/3Dwdemo.hqx*.)

A program must be written from the ground up to support the QuickDraw 3D API. As a result, this degree of support from existing 3-D modeling programs will be slow in coming—the established players in Mac 3-D have too significant an investment in their legacy code to recast their programs entirely around QuickDraw 3D.

Because of this, I predict that the QuickDraw 3D "killer app"—the program that puts QuickDraw 3D in every 3-D illustrator's toolbox—will come from a newcomer to the Mac 3-D software market.

Future Dimensions

By the time you read this, Apple will have shipped QuickDraw 3D 1.1. This version will also be the first to support plug-in renderers. United Kingdom–based LightWork Design (44-114-288-8404, *http://www.lightwork.com*) is developing a photorealistic renderer, tentatively named LightWorks Advanced Photorealistic Renderer.

This product will be a significant development, since QuickDraw 3D's interactive renderer doesn't provide the fine image quality required for professional 3-D illustration.

Apple says that QuickDraw 3D 1.1 will also require less memory and manage memory more efficiently. It had better—I frequently encountered low-memory errors and even crashes when using Microspot's 3-D World on a Power Mac with 24MB of RAM. Apple is going to have a hard time selling QuickDraw 3D as a foundation for games and entertainment titles if users are going to need 24MB of memory for good performance.

QuickDraw 3D 1.1 will include a new geometry type—the trimesh, which is intended to provide better performance with application programs that are using QuickDraw 3D's immediate mode. (Most current 3-D programs use this mode.) Programs will have to be adapted to take advantage of the trimesh.

By this summer, Apple plans to release another version of QuickDraw 3D that will deliver full extensibility. This version (Apple hasn't determined its number yet) will add support for plug-in shaders, geometry types, and even file formats.

And then there's the Internet. QuickDraw 3D models

QuickDraw 3D Does Windows

Microsoft, move over. QuickDraw 3D 1.1 will be the first cross-platform version of QuickDraw 3D—Apple will have versions for Windows 95 and Windows NT, competing with Microsoft on its own turf.

Microsoft has its own 3-D efforts. And I mean *efforts*—Microsoft has two distinct 3-D irons in the fire. First, there's Direct3D, a low-level API designed to enable hardware accelerators. Direct3D is built around Reality Lab, a consumer-level 3-D technology aimed at applications such as games and multimedia titles; Microsoft acquired Reality Lab last year when it bought its developer, RenderMorphics.

Microsoft's second 3-D initiative involves support for Silicon Graphics' OpenGL, a 3-D API designed for high-end tasks such as modeling and computer-aided design. Support for openGL has been added to both Windows NT 3.5 and Windows 95.

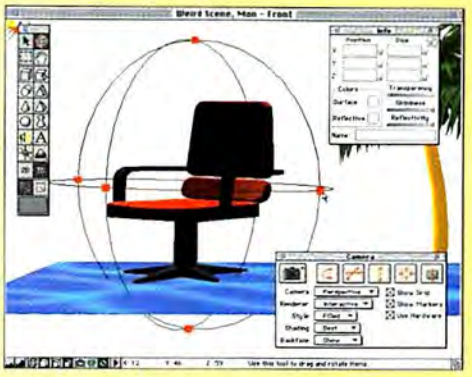
Both technologies are impressive, but each has its own API and its own learning curve for developers—and neither provides for standard user-interface elements or cross-platform file exchange. Developers I talked to applauded Apple for creating a single technology that encompasses everything from games to high-end modeling and that includes user-interface guidelines and a file-exchange format.

Apple also has the edge in timing: At this writing, Direct3D for Windows is in beta testing and scheduled to ship in June. Microsoft says a beta of the Mac version won't ship until late this year. The fact that QuickDraw 3D will provide game and multimedia developers with a cross-platform technology by summer is another good sign.

Of course, Windows itself has proven that a technology doesn't have to be the first or the best to be the most successful, so it remains to be seen what QuickDraw 3D's ultimate impact on the Windows world will be.

But most developers and 3-D gurus seem optimistic about Apple's chances of establishing a cross-platform 3-D standard. QuickDraw 3D's availability on both platforms will encourage Mac and Windows developers alike to support it and the 3DMF format. History has shown that Apple's Mac OS–only technologies (QuickDraw GX, PowerTalk) have stumbled, while its cross-platform technologies (TrueType, QuickTime) have become major standards.

Exploring the QuickDraw 3D User Interface



Just as Apple has created guidelines that dictate the appearance of Open and Save dialog boxes and of the QuickTime movie controller bar, it has created user-interface guidelines for 3-D programs. Microspot's 3-D World (left) is the first—and at present, the only—program that uses the QuickDraw 3D user interface.

One key characteristic of this interface is a set of straightforward controls, called *widgets,* for resizing, rotating, and otherwise manipulating objects. Three-dimensional versions of the resizing handles that are common in drawing and publishing programs, widgets make it easy to manipulate 3-D objects and lights. When you select an object to be rotated, a rotation widget appears. You can rotate the object by dragging any of the widget's handles. (When the mouse pointer moves over a handle, its shape changes to a hollow arrow, as shown here.)

QuickDraw 3D also provides a 3-D viewer (right) that any type of program—from word processor to Web browser to publishing program—can use to display 3DMF objects. The viewer provides a simplified set of four controls that let you view objects from different angles.

are already appearing on Web sites, but Apple has bigger things in mind. It has proposed that the 3DMF format be adopted as an extension of the Virtual Reality Modeling Language (VRML), the standard for 3-D Web sites.

Apple has joined Netscape Communications and Silicon Graphics in supporting a proposed VRML 2.0 specification called Moving Worlds. The file format for Moving Worlds will be an extension of QuickDraw 3D's 3DMF format. Although other companies, including Microsoft, are promoting their own 3-D Web agendas, the fact that Apple is in cahoots with such major players as Netscape and Silicon Graphics bodes well for 3DMF's influence on the Web.

The Last Word

Apple is also working to dovetail QuickDraw 3D with QuickTime, QuickTime VR, and QuickTime Conferencing. This conjures up intriguing possibilities: imagine working with 3-D models in a shared environment, applying QuickTime movies as texture maps, and combining 3-D models with QuickTime VR scenes.

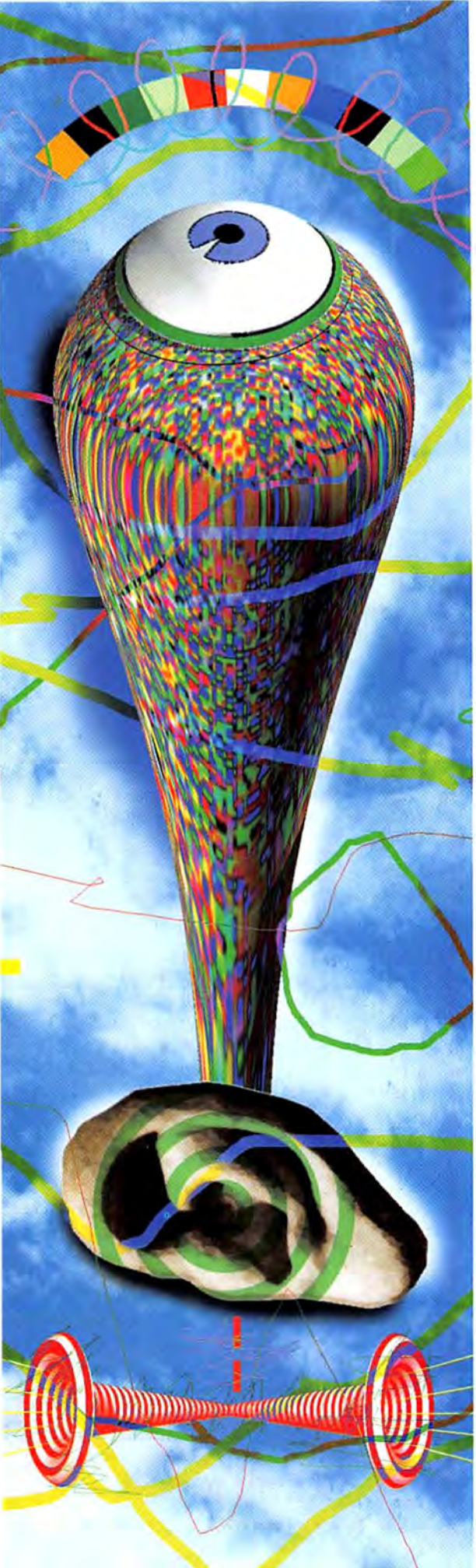
In the meantime, Apple must work hard to establish QuickDraw 3D as the standard foundation for cross-platform 3-D. This means encouraging software developers to support more than just the 3DMF file format and helping them adapt their existing programs. The current state of QuickDraw 3D support among modeling programs isn't good enough.

Nor is the current field of QuickDraw 3D accelerator cards. Apple's card provides solid performance at a reasonable price, but a wide range of options won't appear until this summer (see the sidebar "QuickDraw 3D Accelerators: Not So Quick on the Draw").

In the end, QuickDraw 3D's greatest impact will be in the game, multimedia, and Web worlds. Those markets are far larger than the market for 3-D modeling software, and QuickDraw 3D's support of inexpensive accelerator hardware will make it possible for consumers to dramatically enhance their systems' capabilities for not much more than they'd pay for a few new titles. For a taste of what 3-D might do for games, look at the screen shot "Are You Game for QuickDraw 3D?"

As more developers incorporate 3-D into their efforts—and especially when hardware acceleration migrates from expansion boards onto motherboards—exploring the third dimension will become as routine as playing CD-ROM video or viewing a Web graphic. QuickDraw 3D stands a good chance of being the reason why. **m**

Macworld contributing editor and *Media* columnist JIM HEID covers multimedia technologies and produced the interactive CD-ROM that accompanies his *Macworld New Complete Mac Handbook* (IDG Books Worldwide, 1995).



Multimedia

FROM PRESENTATIONS TO INTERACTIVE TITLES,

Options

WHEN IT COMES TO MULTIMEDIA authoring software, there's good news for everyone. Thanks to the broad selection of approachable, affordable authoring programs now available, businesspeople, educators, and other mere mortals can create winning multimedia productions. These Volksprograms don't provide the development horsepower of their Cadillac cousins, but they offer easy entry into the interactive world.

At the same time, the number of authoring packages for high-end, skilled multimedia producers continues to grow, and the features they offer are increasingly sophisticated. As a result, the biggest problem facing multimedia developers these days is a matter of choice: with all the authoring packages on the market, how do you pick the one that's right for you?

For this article, I evaluated ten programs that span the spectrum from simple interactive presentation to complex multimedia development. I highlight each program's strengths and weaknesses and describe the types of projects and users for which each is best suited. For a quick comparison of their features, see the table, "The Book on Authoring Features."

Entry-Level Authoring

Who They're For Entry-level authoring packages are best suited for creating uncomplicated, interactive business presentations and educational applications.

What They Offer These programs generally feature a simple, straightforward interface, modest system requirements, and low cost.

The Big Picture It's possible to create simple interactive programs using a presentation program such as Adobe's Persuasion or Gold Disk's Astound. I don't recommend it, though.

A better bet for basic interactive presentations is an entry-level authoring tool. Besides branching between screens and playing movies and sounds, these programs let you create sophisticated effects, such as buttons and hot spots that are highlighted when the mouse pointer is over them. Some also support hypertext, which lets you trigger an event when the user clicks on a word or phrase.

Keep in mind, though, that using an entry-level authoring program is like riding a bicycle with training wheels: you can't crash, but you can't race, either. None of the programs reviewed here let you create a stand-alone, double-clickable application file for easy distribution, and cross-

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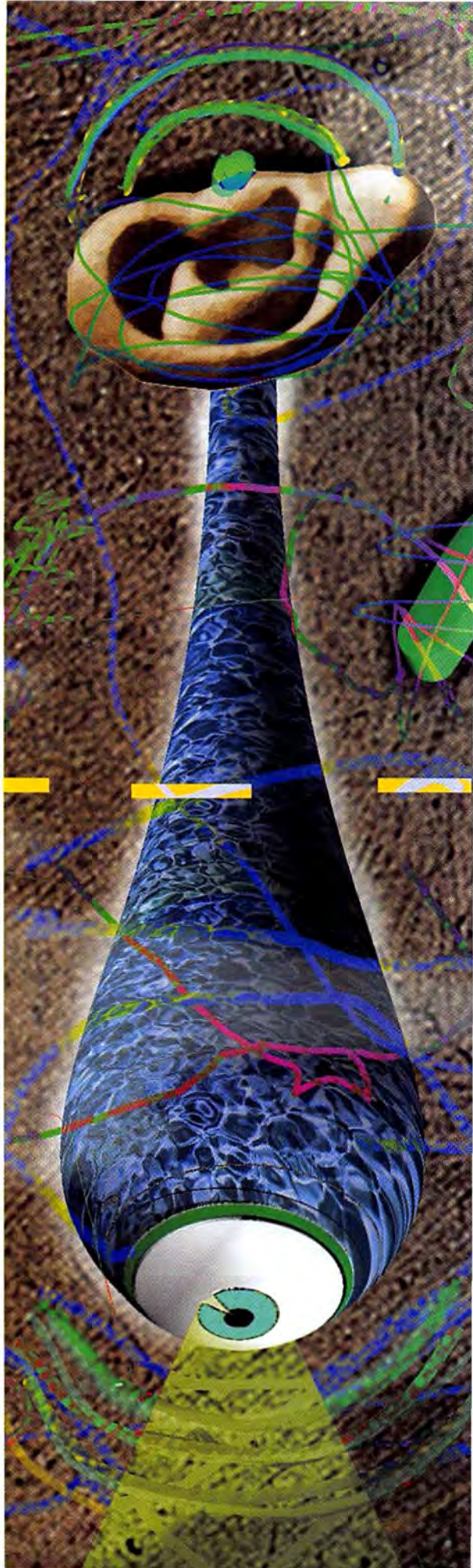
Multiply



platform compatibility is iffy at best. For those features, skip to the "Professional Authoring" section.

The Close-Up I tested four entry-level programs: Interactive Media's Special Delivery 2.1 (*http://www.imcinfo.com*); Roger Wagner Publishing's HyperStudio 3.1 (*http://www.hyperstudio.com*); Pierian Springs' The Digital Chisel 2.0.1c (*http://www.pierian.com*); and PowerProduction Software's Digital Box Office 1.0 (*http://www.powerproduction.com*). The first three are fine programs, each with a unique mix of strengths. Digital Box Office has promise, but too many rough edges.

Special Delivery If you're used to a linear presentation program, Special Delivery is an excellent step up. It provides such presentation-program staples as a slide-sorter window and the ability to create speaker's notes. Special Delivery can even import Persuasion and Microsoft PowerPoint files. But it also provides easy-to-use branching and interactivity features, and it's the only program in its class that supports 24-bit color.

To create screens in Special Delivery, you draw placeholders, called portals, and import elements into them. But portals aren't just frames. Switch to Special Delivery's button view, and you can draw links between portals, turning them into buttons that play movies, show or hide elements, or branch to other screens or even other programs. The scheme is easy and fast, although it can be difficult to decipher the links in a screen containing lots of interactive elements.

Special Delivery can't import text files, however; nor can you create text fields containing standard Mac scroll bars. The program lacks animation features and its interface has cosmetic rough spots, such as some poorly organized dialog boxes. Overall, though, Special Delivery is well suited to productions that require full 24-bit color support and don't involve animation or extensive text handling.

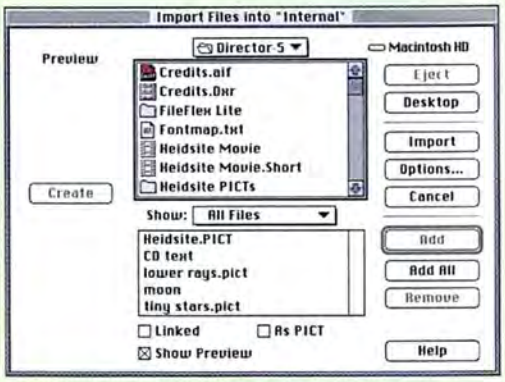
HyperStudio and The Digital Chisel These two programs are more ambitious than Special Delivery, providing a broader range of authoring features with an emphasis on education. In each application, a tool palette provides painting and button-manipulation tools (The Digital Chisel also

BY JIM HEID

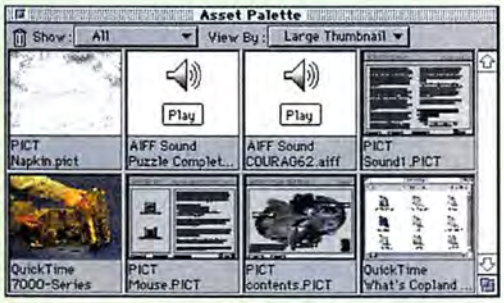
ILLUSTRATIONS BY JOHN HERSEY

Importing and Managing Media

The first step in an authoring project—after careful planning, storyboarding, interface testing, and media production—is to import your content.



Macromedia Director 5.0, like most high-end authoring programs, lets you import multiple elements in one fell swoop.



High-end programs provide a window that shows the elements used in a project, as shown here in Director 5.0 (middle) and mTropolis (bottom). Director's Internal Cast window is far more than just an element listing—a cast can have its own scripts, and you can switch between multiple casts, a capability that allows great flexibility in structuring projects. mTropolis earns points for providing several viewing options and for enabling you to audition sounds. Apple Media Tool enables you to import items by dragging icons from the Finder to the Media window.

provides object-oriented drawing tools). File-import commands let you bring in graphics, sounds, movies, and text. To specify branching or other interactivity, you double-click on an element and then specify events in a subsequent dialog box.

Text support is excellent, as HyperStudio and The Digital Chisel offer scrolling text fields and hypertext. Both programs also provide animation features, can control an external laser-disc player, and play tracks from an audio CD.

With the programs' education-oriented features, you can easily create multiple-choice or true-false tests by designating buttons or other hot spots as correct or incorrect answers. The Digital Chisel out-educates HyperStudio—it can play sounds when students make correct or incorrect choices, calculate and display the final score when the test is complete, and display student progress in a database window. The Digital Chisel can also import 24-bit color images; HyperStudio is limited to 8-bit color. And The Digital Chisel comes with an unbeatable educational site license ($895), which permits every staff member *and student* to copy the program.

But HyperStudio is no high school dropout. It's more reliable than The Digital Chisel—the latter's Undo command, for instance, often undoes the wrong action. HyperStudio is also the only program in this class that provides a full scripting language, a capable variant of the Logo language popular in education settings. HyperStudio's QuickTime support is excellent—used with a Mac containing video-digitizing hardware, it can display live video and capture single frames; The Digital Chisel can't do either. And HyperStudio is the only program in this group that enables you to show the QuickTime navigation scroll bar.

HyperStudio is also extensible: programmers can write modules that add new features to the application. HyperStudio ships with numerous first-rate modules, including one that provides text-to-speech translation and two that let you link elements in a presentation to specific Web sites. Overall, The Digital Chisel and HyperStudio are both excellent applications, though HyperStudio is the more powerful of the two.

Digital Box Office This relative newcomer brings some good ideas to the entry-level authoring market. A timeline window makes it easy to create transitions between screens, as well as special audio effects such as background music that plays across multiple screens. You create interactivity by selecting objects, then choosing options from a tool palette. As you do, lists of events and actions appear—no scripting necessary.

But these good ideas are overshadowed by an awkward interface and some bugs. The tool palette has a confusing array of 11 icons—it looks like a wall of hieroglyphics. The program's Undo command doesn't always work. Attempting to import an audio-only QuickTime movie earns you the opaque error message "101:-108." All in all, Digital Box Office needs work.

Professional Authoring

Who They're For Professional authoring packages are best suited for skilled, trained multimedia developers who need to create interactive CD-ROMs or kiosks that deliver rich multimedia experiences.

What They Offer These packages provide precise control over a variety of media elements; cross-platform compatibility; broad file-format support; custom menus and

dialog boxes; and animation controls.

The Big Picture If you want to create finely tuned, fully featured productions, you need a high-end authoring program. Scripting languages and support for custom code give you full control over media, memory, disk files, and more. Resource-management features let you use memory efficiently and squeeze every bit of performance out of a CD-ROM drive. Support for custom pull-down menus enables a navigation scheme every Mac and Windows user can follow.

It takes time to master the advanced features in a professional authoring program, however. In most cases, prepare to spend some real money, too.

The Close-Up Given the Mac's popularity among multimedia developers, it isn't surprising that the largest selection of programs is in the high-end group. I tested six: Apple's Apple Media Tool 2.0 (*http://www.appple.com*); mFactory's mTropolis 1.0 (*http://www.mfactory.com/*); Macromedia's Authorware 3.5 (*http://*

Stocking the Media Toolbox

As robust as most authoring programs can be, you'll still need other applications to create a rich multimedia presentation. Here's a guide to the best media-production programs and utilities available.

Video Editing and Effects

Adobe After Effects ($1995; 415/961-4400, *http://www.adobe.com*), the industry-standard motion-effects package, lets you layer text, images, and video for stunning special effects (see *Reviews,* March 1996).

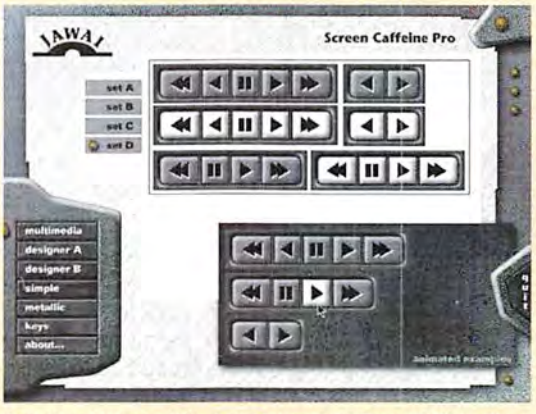
Adobe Premiere ($795; 415/961-4400, *http://www.adobe.com*), the Mac's top video-editing program, doesn't handle long-form projects with great efficiency. But it's well suited to creating the kinds of movies typically used on CD-ROMs (see *Reviews,* March 1996).

MetaTools Final Effects 3.0 ($695; 805/566-6200, *http://www.hsc.com*), a set of plug-ins for After Effects, adds dozens of special effects, from 3-D transitions to explosions (see *Reviews,* April 1996). (Final Effects AP, a set of plug-ins for Premiere, is now available, too; see *Reviews,* elsewhere in this issue.)

Terran Interactive Movie Cleaner Pro ($695; 408/353-8859, *http://www.terran-int.com*), an essential part of digital-video production, compresses movies so that they play smoothly from a CD-ROM. No compression utility is easier to use or provides better results than Movie Cleaner Pro (see *Reviews,* April 1996).

Audio Editing and Processing

Waves L1 Ultramaximizer ($600 to $850; 423/588-9307, *http://www.waves.com*) optimizes low-bandwidth audio to sound its best although CD-ROMs and the Web don't allow for CD-quality audio (see "The Mac Recording Studio," December 1995, and *Media,* April 1996).



Give Your Screens a Lift Jawai Interactive's Screen Caffeine Pro is a CD-ROM–based collection of screen backgrounds, textures, and buttons that you can use in your productions.

Image Editing and Screen Design

Adobe Photoshop ($895; 415/961-4400, *http://www.adobe.com*) is the definitive image-editing program, widely used by multimedia developers to design screens (see *Reviews,* January 1995).

Adobe ScreenReady ($199; 415/961-4400, *http://www.adobe.com*), a timesaving Adobe utility, lets you use a page-layout program to create screens (see *Reviews,* December 1995; and *Media,* June 1996).

Equilibrium DeBabelizer ToolBox ($399; 415/332-4343, *http://www.equilibrium.com*), a graphics workhorse, can convert file formats, optimize graphics for 256-color displays, and more. It's an essential tool for taming the myriad graphics behind a large project.

Clip Media

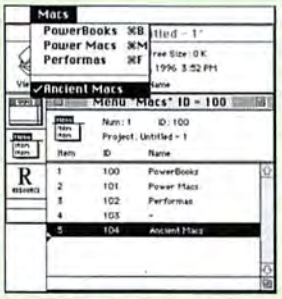
Jawai Interactive's Screen Caffeine Pro ($149; 512/469-0502, *http://www.jawai.com*), a CD-ROM with more than 600 graphics, offers screen backgrounds, buttons, controls, dials, and more. A slick viewer lets you browse the collection, apply variations, and develop an original user-interface design.

Network Music's Presentation Audio (619/451-6400), a library of original music, is available on five CD-ROMs ($49.95 each). The library has been used by smart broadcasters since 1979. The CDs are currently available in Windows format only, but Macintosh users can access the WAV files on the CDs via Apple's PC Exchange software. It's worth the trouble: this is the best stock music available.

Designing the User Interface

Many media producers use programs such as Adobe Photoshop to design screens and backgrounds, but ultimately you must rely on an authoring program's layout features to position multiple media elements and create buttons, hot spots, and other user-interface elements.

Director 5.0's built-in, 24-bit painting features (top) complement its animation features, while its text-editor window (bottom) enables you to create, format, and edit antialiased text effortlessly.



Among authoring programs, SuperCard provides the best support for standard user-interface elements. Its menu editor makes it easy to create pull-down menus complete with ⌘-*key* shortcuts, dividing lines, and check marks.

www.macromedia.com); Allegiant Technologies' SuperCard 2.5.2 (*http://www.allegiant.com*); Oracle's Oracle Media Objects 1.0.5.4 (*http://www.oracle.com/*), which takes first place in the Longest Version Number event; and Macromedia's Director 5.0.

Apple Media Tool, mTropolis, and Authorware enable you to create projects without writing scripts (the latter two also provide scripting features). SuperCard, Director, and Oracle Media Objects, on the other hand, rely heavily on scripting.

Apple Media Tool Apple Media Tool (AMT) 2.0 is ideal for someone wanting to graduate from an entry-level authoring package. It provides the click-and-drag simplicity of an entry-level package, but adds excellent cross-platform support and other benefits.

You won't find a single content-creation tool in AMT—no text tool for typing a headline or fixing a typo, no shape tools for drawing lines or boxes. In the world according to AMT, you create media elements in other programs and use AMT to integrate them. The process is easy, although managing links in large projects is cumbersome.

AMT 2.0 supports text much better than its predecessor did; you can, for instance, create scrolling text fields containing hypertext links. And a new cross-platform run-time player makes it a relatively painless process to create Mac and Windows versions of a title that share a single set of media elements.

AMT 2.0 also offers superb support for QuickTime VR—you can include both object and panoramic movies in a production with absolutely no scripting. Only AMT and mFactory's forthcoming mTropolis 1.1 can make this claim.

AMT 2.0 lacks a scripting language, but Apple sells a companion product, the $995 Apple Media Tool Programming Environment, that enables you to add custom code for implementing dialog boxes, disk input/output, and custom menu bars. Alas, the Apple Media Language, as it's called, is oriented toward programmers and is more difficult to learn than the scripting languages used by other programs.

But this drawback is consistent with AMT's design philosophy as a program that integrates the efforts of a team. In AMT's world, a programmer is available to implement anything more complex than branching between screens or displaying, hiding, and playing media. That isn't always the case in the real world, of course. If you aren't a programmer and can't hire one, but need things such as dialog boxes, multiple windows, math calculations, disk access, and custom menus, look for a different authoring program.

mTropolis Any program that costs $4995 had better be good. mTropolis is good. In some areas, in fact, it's awesome, combining the performance and power of Macromedia Director with an unthreatening interface and a groundbreaking approach to object interaction.

To sum up, mTropolis is a superb choice for dynamic interactive games and animation-oriented titles. However, for titles requiring custom menu bars and dialog boxes or database features, consider SuperCard, Oracle Media Objects, or Director instead—C programming is required to add these features to an mTropolis title.

Authorware Originally designed to enable educators to create interactive, educational courseware, Macromedia's Authorware combines the industrial-strength features

Authoring Meets the Web

As the red-hot World Wide Web evolves from a frontier into a mainstream communications medium, Web developers are increasingly eager to offer more than text, graphics, and hyperlinks on their sites. Here are three ways in which authoring programs and the Internet can work together.

Browser Plug-Ins Using plug-ins—software add-ons that work within a Web browser such as Netscape Navigator 2.0—Web content developers can endow their sites with animation, sound, and sophisticated user interfaces.

The most popular browser plug-in for multimedia is Macromedia's free Shockwave for Director (415/252-2000, *http://www.macromedia.com*), which lets you embed specially adapted Director projects in HTML documents. When users have the Shockwave for Director plug-in installed, they can view multimedia content—a spinning globe with a jet-sound effect on an airline's home page, for instance—that users without the plug-in don't see. The newly released Shockwave for Authorware lets users view Authorware projects on the Web.

Pierian Springs' $159 Digital Chisel:// HTML is a special version of The Digital Chisel that can convert projects into static HTML screens. This plug-in turns The Digital Chisel into a basic Web authoring tool, but doesn't enable the direct playback of The Digital Chisel productions over the Web. On the other hand, Interactive Media offers the free Special Delivery Internet Helper Application, which enables Web surfers to download and automatically launch Special Delivery projects. While the helper application allows Special Delivery developers to distribute projects over the Web, it doesn't permit projects to play within Web pages.

CD-ROMs with Internet Access With the right software, developers can create interactive multimedia titles that offer consumers the speed and storage capacity of a CD, along with the up-to-the-minute timeliness possible with the Web. A CD-ROM on sports, for example, could link to a Web site that displays current statistics.

One crude way to accomplish this is with a few lines of AppleScript code that launch a Web browser and go to a specific URL (Uniform Resource Locator). This works in any AppleScript-savvy authoring program, including SuperCard, HyperCard, and Oracle Media Objects.

Director Courts the Web Macromedia's Shockwave for Director technology allows users to create productions in Director, embed them in Web sites, and view them using the Netscape Navigator browser and Shockwave for Director plug-in. This example, from the Coach's Edge site (*http://www.coachesedge.com*), uses Director animations to illustrate the basketball's moving from player to player, the players' jockeying for position on the court, and the ball's entering the basket.

A better technique, however, is to integrate Web data so that media retrieved from the Web can appear alongside media stored on a CD-ROM or hard drive—no separate Web browser is required.

Allegiant's Marionet ($219) addresses this need nicely, supporting several Internet access protocols, including HTTP and FTP. An external command (XCMD), Marionet works with SuperCard, Apple's HyperCard, Macromedia Director, and programs that support the AppleScript or UserLand Frontier scripting languages.

The forthcoming ClickWorks authoring program, from Scitex (617/275-5150, *http://www.scitex.com/pitango*), makes it exceptionally easy to include information from Web sites directly in a CD. Macromedia says it plans to add direct Web access from CDs to Shockwave for Director sometime this year. And HyperStudio includes a simple program that enables you to access information stored on FTP sites from within HyperStudio projects.

Web Sites with CD-ROM Access The twist here is that a Web site is the primary medium for your content, but the site is linked to a CD-ROM containing high-bandwidth data such as digital video or high-resolution graphics. Imagine a comic-book collector's site that uses the Web for navigation and current pricing information, but uses the CD-ROM to display high-res, full-color samples quickly.

Macromedia's Shockwave for Director 5 has some rudimentary features that enable Shockwave movies to access a local CD-ROM, and Macromedia plans more enhancements for future Shockwave versions.

The Book on Authoring Features

ENTRY LEVEL — HIGH END

	Digital Box Office 1.0	The Digital Chisel 2.0.1c	Editors' Choice HyperStudio 3.1	Editors' Choice Special Delivery 2.1	Apple Media Tool 2.0
Company	PowerProduction Software	Pierian Springs Software	Roger Wagner Publishing	Interactive Media	Apple Computer
Star rating*	★★/3.9	★★★/6.8	★★★★/7.0	★★★★/7.0	★★★★/7.1
List price	$599	$99	$199.95	$259	$495
Phone	310/937-4411	503/222-2044	619/442-0522	415/948-0745	408/996-1010
Screen-Layout Features					
Built-in painting/drawing	○/●	●/●	●/●	○/●	○/○
Alignment/grouping	●/●	●/●	○/○	●/○	●/○
Maximum colors: objects/images	256/millions	256/millions	256/256	millions/millions	NA/millions
Animation Features					
Path-based/in-betweening	●/basic	●/basic	●/basic	○/○	○/○
Interactivity and Interface					
Requires scripting for basic interactivity	○	○	○	○	○
Scrolling text fields/hypertext	○/○	●/●	●/●	●/○	●/●
Run-Time Features					
Performance tuning/Windows support	basic/●	○/○	○/●	○/○	○/●
Comments	Combines object- and timeline-oriented authoring, but has a buggy, awkward interface.	Strong student-tracking and interface, and inexpensive educational site license, but poor Undo command.	Easy to use and very powerful, but relatively few student-tracking options.	Easy to use and offers full 24-bit color support, but lacks hypertext and standard text scrolling.	Easy for basic interactivity and excellent cross-platform support, but advanced features require extra-cost programming environment.

○ = yes, ● = no; NA = not applicable. * Based on features, implementation, innovation, performance, reliability, ease of use, and value. (See Star Ratings section for explanation.) **SuperCard can

developers need with much richer courseware features than HyperStudio and The Digital Chisel provide.

In Authorware, you draw iconic flow-lines that depict the flow of the project and the relationships between its elements. In the program's arsenal of icons, some handle branching while others display QuickTime movies, play sounds, perform calculations, and move objects on screen. Authorware also provides scripting for more demanding tasks, such as performing calculations, responding to dialog-box choices, and accessing disk files.

Authorware has several production-streamlining features. A framework icon specifies that certain elements, such as background graphics and navigation buttons, repeat on each screen—a feature much like a publishing program's master page. Combine this with Authorware's RTF text-file import, which automatically creates a new screen each time it encounters a page-break code, and you have a mean screen-making machine.

Authorware 3.5, which began shipping at press time, can produce native Power Mac and Windows 95 applications and provides excellent Internet support. The program's only real weaknesses: no support for antialiased text, and a fairly steep learning curve. Oh, and the price—like mTropolis, it costs $4995, although Authorware also includes Macromedia Director, xRes, Extreme 3D, SoundEdit 16, and Deck II. (Educational institutions can buy Authorware itself for $995.)

SuperCard This product has been around for ages, and is now better than ever. SuperCard's SuperEdit program is where you do most of your authoring. SuperEdit lets you create windows, import graphics, create custom menus, and import and manage resources such as external commands (XCMDs) and sound resources (SNDs). SuperEdit can't import text files, although you can paste styled text (a standard Clipboard format supported by many word processors) into text fields.

SuperCard provides a full array of object-oriented drawing tools, as well as 8-bit painting features. For interactivity, you need to speak SuperTalk, SuperCard's scripting language. You can't create a branching button, play a sound or movie, or show and hide graphics without writing a script. SuperCard includes several utilities that create common script types for you, but in general you have to type a lot to implement things that involve a few mouse-clicks in Apple Media Tool, mTropolis, and Macromedia Authorware.

One of SuperCard's strengths is the ease with which it lets you create user-interface elements. Creating menus, dialog boxes, pop-up menus, custom icons, windows, and floating palettes is easier in SuperCard than in any of the other programs reviewed here. Allegiant's Marionet extension, which is included, adds excellent Internet support. For creating dynamic, animation-oriented games, mTropolis and Director are better tools. But SuperCard excels at all other tasks, particularly ones that make extensive use of application-style user-interface elements.

Note that of the six high-end programs reviewed here, SuperCard is the only one that doesn't support Windows; a Windows player and run-time editor should be shipping later this year (the run-time version will retail for $495, or $199 for registered SuperCard users).

Oracle Media Objects Like SuperCard, Oracle Media Objects (OMO) borrows heavily from the HyperCard lexicon. Screens are *cards*, a collection of them is a *stack*, and scripts handle every aspect of interactivity. But OMO lacks the excellent project-

Authorware 3.5	Editors' Choice Director 5.0	mTropolis 1.0	Oracle Media Objects 1.0.5.4	Editors' Choice SuperCard 2.5.2
Macromedia	Macromedia	mFactory	Oracle	Allegiant Technologies
★★★★/7.1	★★★★/7.2	★★★★/7.0	★★★/6.8	★★★★/7.1
$4995	$850	$4995	$495	$595
415/252-2000	415/252-2000	415/548-0600	415/506-7000	619/587-0500
○/●	●/●	○/○	●/●	●/●
●/●	●/○	●/○	○/○	●/●
256/millions	256/millions	NA/millions	256/millions	256**/millions
●/basic	●/advanced	●/advanced	●/advanced	●/basic
○	●	○	●	●
●/●	●/○	○/○	●/●	●/●
basic/●	advanced/●	advanced/●	○/●	basic/○
Iconic operating style; excellent courseware features and cross-platform and Internet support; expensive.	Fast, with excellent cross-platform and Internet support, and superb animation and text support, but has a steep learning curve, and scripting is required for most interactivity.	Fast; superb game-development environment; easy to implement most interactivity; excellent cross-platform support; limited text support; expensive.	Straightforward interface and multiplatform support, with tight links to Oracle databases, but scripting required for most interactivity, and limited text support.	Superb resource-management features and support for standard user-interface elements, plus native database features, but projects can be sluggish.

import 24-bit object-oriented drawings, but objects drawn within the program are limited to 256 colors.

management features of SuperCard's SuperEdit program, and in general it's not as mature an authoring tool. You can't, for example, create a stand-alone application—you must distribute a run-time player with your project. On the plus side, OMO includes run-time players for both Mac and Windows. Run-time support is also available for a variety of interactive TV set-top boxes, as well as the World Wide Web.

OMO has other strengths, including path-based animation and a logically designed interface that I found easier to learn than SuperCard's. And unlike SuperCard, OMO can import text files, albeit sans formatting.

OMO also has a unique datasheet that presents information in a spreadsheetlike row-and-column format. Datasheets can even have resizable rows and columns. OMO's Media Talk scripting language includes commands for sorting datasheets and importing tab-delimited text files. These features make OMO well qualified for applications that work with spreadsheet or database information.

OMO is available in trial form from Oracle's Web site. OMO may not squash the competition, but there's a lot to like here, particularly for businesses using Oracle's database and server products.

Macromedia Director The program whose name is synonymous with authoring has just turned 5.0. In the new version, Macromedia has done a beautiful job of addressing the needs of developers who create multimedia on a daily basis. Director 5.0 streamlines numerous aspects of the production process. Unfortunately, the update retains Director's traditional approach to authoring, which makes creating basic interactivity harder than it is with other authoring tools.

In Director, you work primarily in the Score window, a timeline composed of frames into which you place media elements. These elements are then stored in a kind of database called a cast. If you're creating a linear project that will run from start to finish—say, an animation or a self-running presentation—the Score window is fairly easy to use.

Implementing interactivity requires some fancy footwork, though—not to mention writing scripts in Director's scripting language, Lingo. To create a branching button, for instance, you assign a name to the frame where a different screen begins, then attach to the button a Lingo script that causes playback to jump to the named frame when the button is clicked. It's this approach that gives Director its reputation for being a bear to learn.

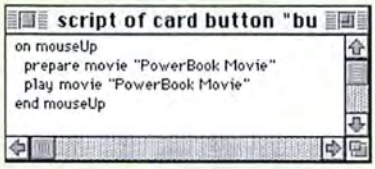
Still, thousands of developers have scaled Mount Director and discovered its treasures: unmatched control over memory and performance; powerful animation features; built-in, 24-bit painting; broad multiplatform support (you have to buy the Windows version in order to create Windows titles, however); a universe of third-party plug-ins, extensions, and canned media elements such as preprogrammed buttons; and Internet support through Macromedia's Shockwave for Director technology. Director's learning curve is steep, but the view is beautiful from the summit.

Director 5.0 takes authoring to new heights. For example, it now supports multiple casts, enabling you to create and reuse templates and adapt titles for other languages. A built-in word processor supports kerning, tabs, and other advanced formatting features. And the moment you finish editing text, Director 5.0 antialiases it—glorious. An included database manager (actually a plug-in that taps into Director 5.0's new extensible architecture) enables you to create and manipulate databases.

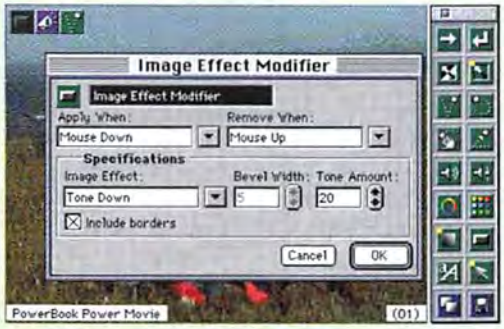
Implementing Interactivity

The way you implement branching and other interactivity is one of the great differentiating factors between programs.

Roger Wagner Publishing's HyperStudio holds your hand through the process. First, you select an item (in this case, a button), and then specify an action to take place when the button is clicked (on the left).



Many programs, including Director 5.0, Oracle Media Objects, and SuperCard, rely heavily on scripting languages for interactivity. This Oracle Media Objects script is attached to a button and plays a QuickTime movie when you click on the button.



Apple Media Tool and mFactory's mTropolis make many aspects of interactivity a click-and-drag proposition. In mTropolis, shown here, you drag modifier icons from a palette (at right) to the media element they modify (in this case, a QuickTime movie). A small icon representing the modifier appears in the upper left corner of the element. Double-click on the icon, and you can fine-tune the modifier's actions. This modifier tells mTropolis to dim the movie's image when a user clicks the mouse on it, in order to provide visual feedback.

In short, this powerhouse program is the best available for complex, performance-sensitive projects involving animation. (For more details on Director 5.0, see *Reviews*, July 1996.)

The Last Word

So which program should you buy? If you're a newcomer and you don't require hypertext and scrolling text fields, get Special Delivery. For educational work or text-oriented projects, both The Digital Chisel and HyperStudio are excellent. The Digital Chisel provides a more complete set of education-oriented features, but HyperStudio is the more powerful program.

At the high end, Apple Media Tool gets the prize for ease of use—there isn't an easier road to cross-platform interactivity. SuperCard is the program of choice for creating interactive titles that rely heavily on standard user-interface elements. mTropolis and Director are preferable for cross-platform development of performance-critical, animation-oriented projects such as games.

If this describes your project, should you buy Director or mTropolis? I strongly prefer mTropolis's approach to authoring, but Director's maturity, superior screen-layout tools, and broad third-party support make it the best choice for developing major-league multimedia.

Of course, creating an interactive production requires more than just an authoring program. You also need video- and audio-production software, a graphics package, and some help with screen backgrounds and music (see the sidebar "Stocking the Media Toolbox").

And don't forget to create storyboards for your ideas, and to design, test, and refine the way in which you present them. This is the hardest part of the process, the part that doesn't have a menu command or keyboard shortcut. Things may have changed dramatically since the days when the only real authoring tools were a typewriter or a pen, but it still takes creativity and hard work to communicate ideas effectively. **m**

Macworld Media columnist and contributing editor JIM HEID produced the interactive CD-ROM that accompanies his *Macworld New Complete Mac Handbook*, fourth edition (IDG Books Worldwide, 1995).

AUTHORING PROGRAMS

MW EDITORS' CHOICE No single program can meet all the needs of today's multimedia authors. Within key categories, however, several programs stand out.

Entry-Level Authoring

★★★★/7.0 **Special Delivery 2.1** This program offers a wide range of interactivity yet has modest system requirements. **Company:** Interactive Media (415/948-0745, *http://www.imcinfo.com*). **List price:** $259.

Educational Authoring

★★★★/7.0 **HyperStudio 3.1** Easy to use yet powerful, HyperStudio is ideal for educational productions. **Company:** Roger Wagner Publishing (619/442-0522, *http://www.hyperstudio.com*). **List price:** $199.95.

Professional Authoring

★★★★/7.1 **SuperCard 2.5.2** The program of choice for developing multimedia applications that require standard user-interface elements and database features. **Company:** Allegiant Technologies (619/587-0500, *http://allegiant.com*). **List price:** $595.

★★★★/7.2 **Director 5.0** This authoring legend retains its steep learning curve but is the best choice for performance-sensitive, animation-oriented, cross-platform productions. **Company:** Macromedia (415/252-2000, *http://www.macromedia.com*). **List price:** $850.

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Diamond Scan 17HX	17"/15.7" DVI*	1600 x 1200/65 Hz NI	H:30-82 kHz, V:50-130 Hz	$849.00
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Diamond Scan 20M	20"/18.6" DVI*	1024 x 768 I, 800 x 600 NI	H:15-38 kHz, V:45-90 Hz	$1,699.00
Diamond Scan 20LP	20"/18.6" DVI*	1024 x 768 I, 800 x 600 NI	H:15-38 kHz, V:45-90 Hz	$1,745.00
Professional Line				
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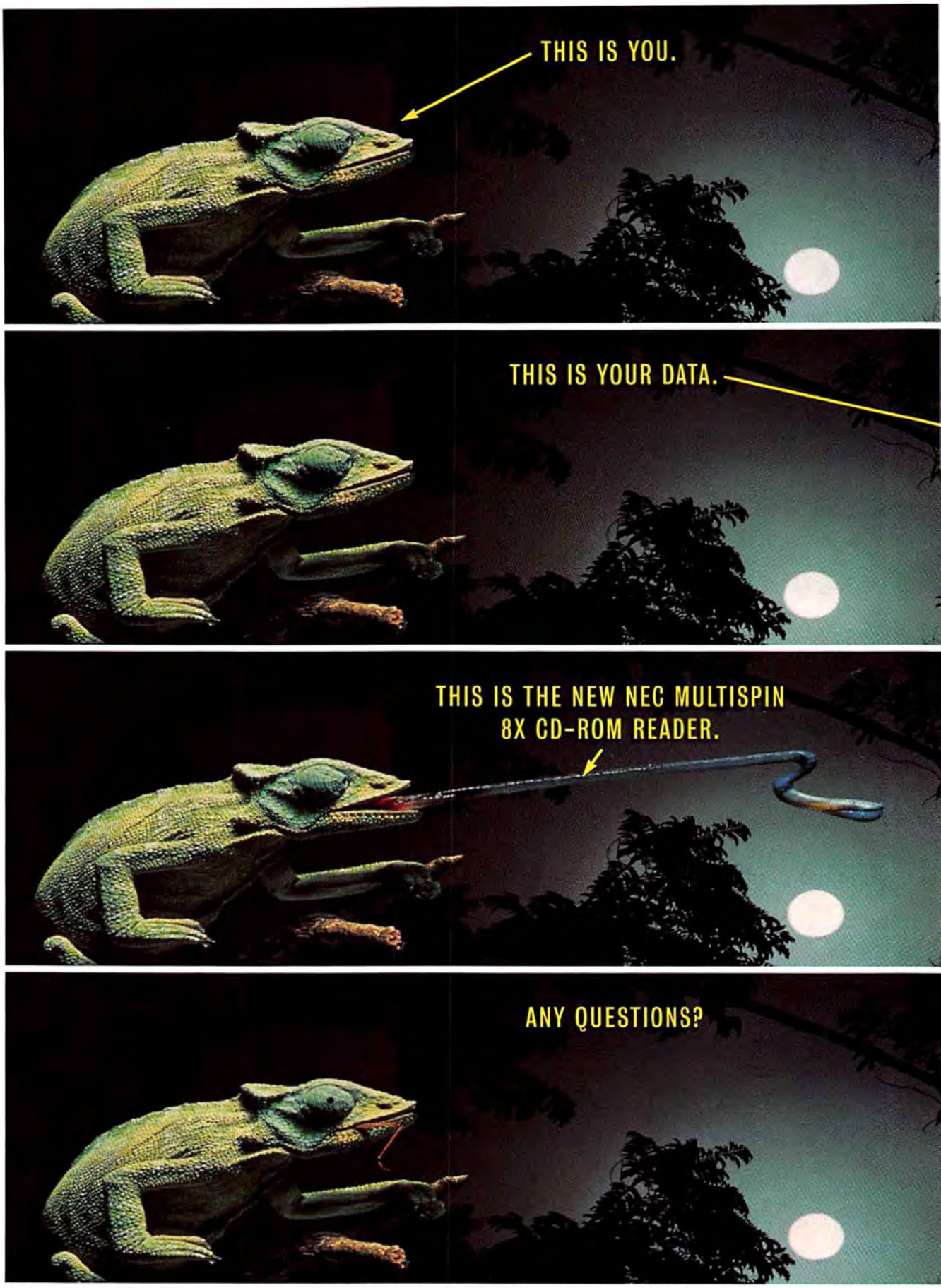

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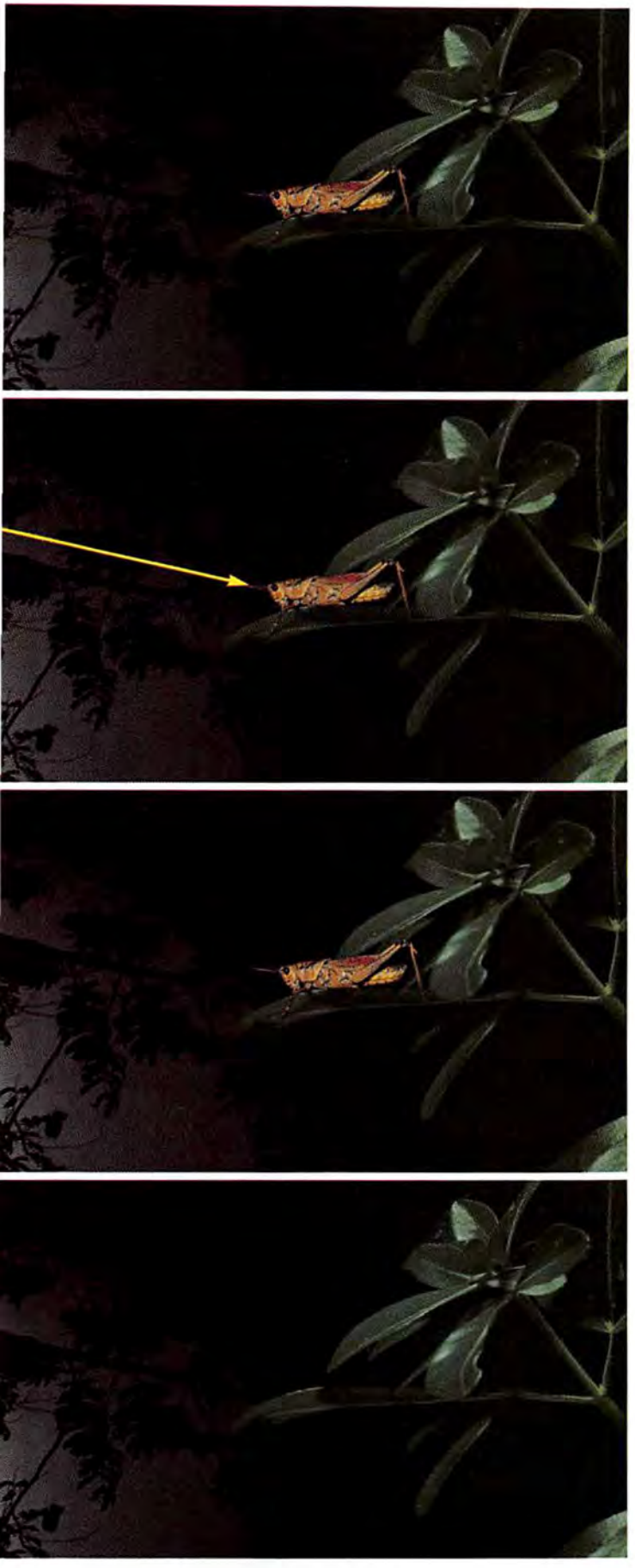

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These top-notch Mac sites will make you a smarter user

The Best Mac Web Sites

BY HOWARD BALDWIN

If surfing is the metaphor for the Internet, then scuba diving should be the metaphor for the World Wide Web. Like the ocean, the Web is a vast and murky place. Diving in randomly, you're just as likely to discover a clear, clean Macintosh site as a clunky site posted by a 14-year-old fan of Smashing Pumpkins.

To save you the trouble of treading water, I've done some diving, and charted the most scenic locations for the Macintosh enthusiast. I've sought out Web sites specifically for Mac aficionados. That covers a lot of people—everyone from user groups and designers, to teachers and consultants, to business folks and futurists who love innovative technology.

To help you find your own special place, I added a side trip on Web search tools so you can divine your own way into the Macintosh world on the Web (and given the speed with which the Web and its links change, these are handy tools to have around).

One of the Web's greatest attributes is also one of its drawbacks: anyone can build a Web page and post almost anything without benefit of objectivity. That's why—with the exception of the technical-support section—I avoid recommending company Web sites. I also stick to Web sites, as opposed to text-based Internet newsgroups (see *NetSmart*, *Macworld*, July 1996 for other Internet resources). I don't discuss certain topics—such as Macintosh databases—because I didn't find impartial, informative Web sites I liked (for Mac databases try *http://www.claris.com* or the newsgroup *comp.sys.mac.databases*).

Some advice before you go: type carefully. One typo when trying to access a Web page will stop your transmission cold. Think of it not as addressing envelopes, but as dialing telephone numbers—you need to be that accurate. (For the height of simplicity, check out this article on Macworld's own Web site, *http://www.macworld.com*, which has links to the sites mentioned here.)

Also, if you get the Web equivalent of a busy signal ("Server does not have a DNS entry"), don't be afraid to try again. Sometimes a second or even third try works. Go figure. (You can try finding the site using one of the search engines described in the sidebar "Top Search Engines.") And remember that links do expire—even between the time I wrote about it and you read about it—so don't be surprised if occasionally you run into a dead end. With that caveat, dive in.

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a.
b.
c.
149
www.matisse.net/files/glossary.html
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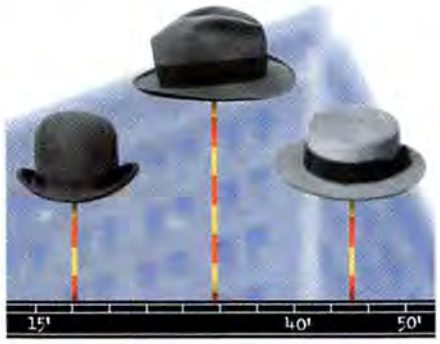
www.cs.brandeis.edu/~xray/macalt.html



MACINTOSH PROFESSIONALS

PROFESSIONALS who want to sharpen their expertise in graphics, desktop publishing, multimedia, and more can find technical details galore for solving problems and advancing their knowledge.

Graphics

It's a tough call to name the best for this category, the bedrock of the Macintosh's strength, but be sure to visit *http://the-tech.mit.edu/KPT/*. Yes, KPT stands for Kai's Power Tools, but *The Tech* is MIT's student newspaper, which handles the site. It leads off with Kai Krause's original 23 tips and tricks for Adobe Photoshop, including a top-ten list of overlooked basics. It follows up with techniques for creating neon or embossed objects, using PostScript art as stencils, and building realistic shadows from PostScript art. Web designers, make sure you check out the tips from Tom Karlo, a computer-science major who maintains the site, and the backgrounds archive, where you can pick out designs for your own Web page (love those rainbow.jpg and fire1.jpg files).

For more neat Photoshop stuff, visit *http://www.fns.net/~almateus/photos.htm* for its collection of artists' Photoshop work put together by Alf Mateus, a doctoral candidate in chemistry at the University of Florida.

Desktop Publishing

This is where the Macintosh market started, and it's still going strong, as evidenced by a visit to *http://www.teleport.com/~eidos/dtpij/dtpij.html*, the DTP Internet Jumplist. Though it is solely a compilation of site links, maintained by Geoff Peters as a volunteer passion, it's a doozy. Start with his search list, divided into general topics, hardware, and software, and you're off into information about DTP associations, fonts, electronic-publishing consultants, and more. In the hardware section you'll find scanning FAQs and tips, sources for recycled ink-jet printer cartridges, and even storage FAQs. Also check out *http://www.printnet.com/PNRes01.html*, a nice compilation of Internet discussion groups, E-mail lists, and vendor sites devoted to prepress and graphics issues.

Video

Anyone interested in digital video—whether hobbyist or professional—should go to *http://www.videomaker.com*. Run by the folks at *Videomaker* magazine, it's an informative classroom, with its glossary of terms, video FAQs (including legal and distribution issues), and conference listings. You can even download video clips from the publication's television show. Also flip the channel to Rick Davis's video page at *http://www.well*

Top Search Engines

We've charted some of the best Macintosh sites in the vast ocean of information called the World Wide Web, but any amateur Jacques Cousteau can tell you that the real joy is in discovery. And the Web is growing faster than plankton. To navigate those unexplored straits and underwater canyons online, you need to use a Web search engine.

The online search engines are powered by Net robots, indexing software, and human librarians who classify, sort, and arrange the Web into a searchable matrix (see *NetSmart*, May 1996). And they're becoming the most profitable aspect of the Internet. The dozen or so most popular search engines are always among the most visited sites on the Net, and competition is high for the advertising dollars that keep these search tools free of charge.

Despite their similar approaches to scanning the Internet, search engines don't always turn up the same results. Depending on the type of search you're conducting, one engine might give you more satisfactory results than another. I've sorted the major engines by the kind of searches they perform, and named top picks in each category.

A THOROUGH SEARCH

Top Pick: MetaCrawler (*http://metacrawler.cs.washington.edu:8080/index.html*)
Runner-up: MotherLoad/Insane Search (*http://www.cosmix.com/motherload/insane/*)

PROFICIENT (AND professional) searchers cross-reference results from more than one engine. Meta-indexes send a query to more than one engine and then organize the results. It takes longer (sometimes 3 minutes for a query), but the meta-indexes sort and remove duplicates.

CONCEPT SEARCHES

Top Picks: Yahoo (*http://www.yahoo.com*)
Infoseek Guide (*http://www.infoseek.com*)

WHEN SEARCHING FOR a concept, you are probably better off using a catalog site. A catalog relies on human editors to sort through URLs gathered with a simple search tool and organize them in categories and classifications. This approach isn't a complete Web search;

.com/user/rld/vidpage.html, which contains a wealth of information about organizations such as the National Association of Broadcasters, the Society of Motion Picture and Television Engineers, leading video researchers and product manufacturers, studios, and viewing utilities from Radius and Progressive Networks.

Multimedia

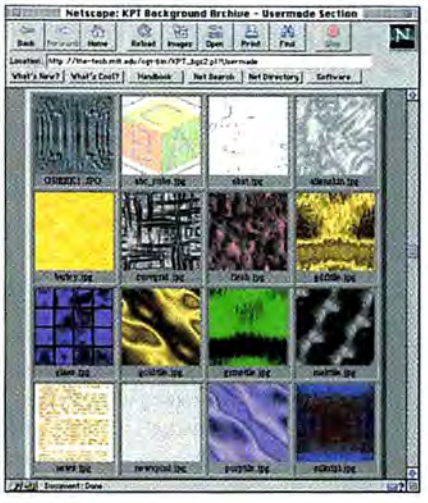
For information on the Motion Picture Experts Group (MPEG) standard, check out *http://www.crs4.it/HTML/LUIGI/MPEG/mpegfaq.html*, an excellent compilation of data about the standard, provided by the Center for Advanced Studies in Sardinia, of all places. If you're interested in sound, you can learn more about the Musical Instrument Digital Interface (MIDI), at *http://www.eeb.ele.tue.nl.midi/index.html*, which discusses not only its history but also the oxymoronic idea of its multiple standards.

Education

Pedagogy and the Web are working hand in hand to improve education. Teachers interested in how to best benefit from the Web should visit *http://web66.coled.umn.edu/*, a page sponsored by 3M and the University of Minnesota that includes a registry of elementary and secondary schools with home pages. The site also includes instructions for teachers who want to set up a Web, FTP, or mail server on a Macintosh, along with a section full of HTML parts to include in classes' Web sites. Also click on the EdWeb Home Room at *http://k12.cnidr.org:90/resource.cntnts.html*, which contains discussions of computers and education, education reforms for the next century, and the role of the Web in education.

Trade Shows

Here's a great place to improve your technical savvy. At trade shows, you're more likely to meet company engineers, whom you may not get to see face to face anywhere else. For unbiased viewpoints, check out *www.guerrilla-guide.com*, a Web page to help you save "your time, money, and sanity" at trade shows.



Wallpaper to Go
People create backgrounds for Web sites and post them in the Photoshop archives of the MIT school newspaper, *The Tech* (*http://the-tech.mit.edu/KPT/*).

THESE WEB NAVIGATION TOOLS WILL POINT YOU IN THE RIGHT DIRECTION

fewer pages are covered, but the results tend to be more concise and organized by subject. You rely on the catalog's subjective classification and organization. As the Web grows, these catalogs are becoming more of a "best of the Web" than a complete concordance of what's online.

INDEX SEARCHES

Top Pick: Alta Vista (*http://www.altavista.digital.com/*)
Runner-up: Excite (*http://www.excite.com*)

AN INDEX SEARCH CASTS a wider net than a catalog does. Search results from these engines come from a computer-generated index of Web pages and use an algorithm to sort documents to determine their relevancy—for instance, the number of times a keyword appears as well as its proximity to the top of the document. But indexes aren't adept at recognizing context, matching synonyms, or sorting out homonyms. An index search using the keyword *beat* will return more than just information on Allen Ginsberg and William Burroughs; you can also get pages on metronomes, rave music, and gingersnaps.

Both of these picks can also search Usenet newsgroups, which nets the online buzz on a certain topic.

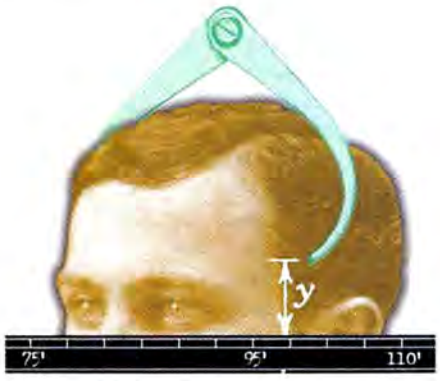
PERSONAL INDEXES

Top Pick: none

TODAY'S SEARCH technology exists on remote sites that you access via a Web browser, but personalized search engines will arrive soon. Companies are developing software that searches the Net according to your tastes and interests, then builds a personal matrix of data that the software searches and updates regularly. Applications like WebCompass from Quarterdeck (310/309-3700, *http://www.quarterdeck.com*), due out this summer for the Mac, or the search technology in Copland and Cyberdog (code-named V-Twin) should help you manage the information overload that we're all experiencing these days.

Learning Curve

Once you settle on a specific search tool, take the time to learn how to formulate a query. Learning Boolean syntax may seem difficult at first, but it makes a big difference in the accuracy of your searches. All the engines listed here have good instructions for learning how to filter your search results with the basic *and*, *or*, and *not* constructs. That way, you won't search for "Macintoshes" and get fruit trees. The more informed you are about each search engine, the easier it will be to find what you want on the Web.—MATTHEW HAWN



MACINTOSH EXPERTISE

MAC-SPECIFIC Web sites are great places to boost your technical knowledge about the platform, including how much you should pay for a Mac.

Systems

Far be it from me to spread rumors, but Corey Kirk at Simon Fraser University isn't so discreet. On his page, *http://www.imc.sfu.ca/mac/*, he posts the latest reports on Macintosh hardware and software—including Copland (Mac OS 8), Cyberdog, OpenDoc, Gershwin, and more. "Everything here is readily available on the Net," he says, "so I am not responsible for spying on Apple." Some of it comes directly from Apple, of course, and Corey denotes that with an Apple logo. He's also built a page specifically on Copland, from which you can download Copland icons and the Aaron utility for making your interface Copland-esque. For another Copland-specific site, browse Austin Shoemaker's page, *http://www.netline.net/~austin/cops/cops.html*, with its basic FAQ on the upcoming Mac OS.

Troubleshooting

Once you buy a Macintosh, you'll find it's so easy to set up that troubleshooting is unnecessary (in our dreams). Of course, with System 7.5.3 and Open Transport 1.1, you might encounter some glitches. In that case, there's no better destination than *http://www.mrmac.com/mac-mgrs.html*, the Mac Managers Home Page. Maintained by San Diego consultant Michael Robertson, it lists summaries of questions and answers posted by Macintosh managers, the folks in the trenches who are knee-deep in the new and complicated technologies coming out of Cupertino.

Troubleshooters will also like Quill Services' Complete Conflict Compendium at *http://www.islandnet.com/~quill/c3data.html*, which lists conflicts by platform, product, system, and symptom, no less. It also provides something called The Hmmmm Zone, a listing of unexplained crashes that you can add to—just in case the digital equivalent of Columbo can't figure it out.

For the official line on troubleshooting solutions, check out *http://support.info.apple.com/aboutapple/aspn.html*, part of the Apple Solution Professionals Network.

User Groups

Once you've solved your specific setup questions, consider joining a local user group for ongoing problem solving and interaction. Frequently user-group mavens are among the first to hear about new products and updates. User Group Connection, an independent organization, lets you find domestic and international groups at *http://www.ugconnection.org* through an interactive search tool. Just fill in your state, zip code, or area code, and off it goes (it also works for other platforms and operating systems, including Apple II, Newton, OS/2, Windows NT, and Unix). For Apple's official list, see *http://www2.apple.com/documents/usergroups.html*.

Shopping

Before you go shopping for a Mac, learn what the going rate is for either a new or a used one. There are several excellent resources on the Web. For used machines, log on to the American Computer Exchange, at *http://www.crl.com:80/~amcoex/*, which lets you download a price calculator for used Macs.

Although I promised not to talk about corporate sales stuff, I did love window shopping on one system vendor's home page. At *http://www.powerpc.com*, PowerComputing has built an interactive fill-in-the-blank engine that lets you create the Macintosh clone of your dreams (or your budget). Point and click on the RAM, hard drive, monitor, and everything else you want, and the engine tells you what system to ask for and how much it'll cost. Putting together my own dream desktop machine ran up a potential bill of almost $23,000, which, coincidental-

Hot Links

HERE'S THE

So you've surfed to your heart's content and you still can't find the Macintosh information you're looking for. Or you think, Wouldn't it be nice to have all the links I want in one place? Short of creating a truly elegant bookmark system, I suggest you shoot on over to these sites. They contain links to an amazing potpourri of Mac-related sites.

Imagine if Gene Siskel and Roger Ebert had their own Macintosh Web pages, and you've got the idea of, respectively, Jay J. Myers's Macintosh WWW Pointers at *http://www.nmia.com/~jjm/* and Elliotte "Rusty" Harold's The Well Connected Mac at *http://www.macfaq.com*. Besides links to other sites, they also provide capsule reviews of their favorite hardware, software, utilities, and books. Interested in current events? Each site has an impressive newsstand of Macintosh magazines (including ours and the competition's), newsletters, and E-zines (electronic magazines). In addition, Myers's site has pricing information for used Macs. He's built in links to the Yahoo search engine and the MIT software archives, so you can search for information

ly, was just below the price of the house I grew up in.

Tech Support

Any Macintosh vendor you can name has a Web page, because it's an easy way to make product literature available. But only Macintosh vendors worth their salt let you use their Web pages to make your life easier—for instance, by making their technical-support system accessible. Apple Computer is a leader in this regard; its page at *http://www.support.apple.com* has links to its technical information library and newsgroup archives. At *http://www.claris.com* you'll find FAQs, as well as a valuable tech-support database with built-in search capabilities. There's also a software library with updates, demos, and shareware.

Mac-only word processor developer Nisus wins the award for most candid Web page, at *http://www.nisus-soft.com*. "We have not abandoned Easy Alarms," reads one section, "but the plans for its future are a bit unclear at present. When an update is scheduled, we will announce it here." And: "There aren't any frequently asked questions about Laser TechFonts. But if any come up, we'll be sure to mention them here!" The site also offers demos, updates, and macros appropriate to Nisus's products.

On the hardware side, bravo to Global Village Communication's The Village site (*http://info.globalvillage.com*) for its links to downloadable Internet software and to Quantum's site (*http://www.quantum.com*) for its library of information relating to the future of storage technology. Its Storage Research Center reveals what the engineers are working on at Carnegie-Mellon; Stanford; MIT; the University of California, Berkeley; and Lawrence Livermore National Laboratory. It's enough for us to forgive the anemic utilities section (containing all of five utilities—four for Windows and one for Unix) and tech-support access only through a BBS.

Consultants

If you're looking for ongoing contractual help, visit the Macintosh Consultants Network, at *http://www.macn.com*. Members focusing on Web development are listed separately from those who do installation, repair, or training. Consultants can fill out a form to list their specialties.

If you're a consultant who wants to develop closer ties to Apple, join the Apple Business Consortium (*http://www.applebiz.com*), an independent group of more than 300 consultants. Not affiliated with Apple, the nonprofit ABC conducts seminars for its business- and finance-oriented members as well as listing their contact information. If you're looking for a consultant, this is a handy site to hit.

Back to the Future At Austin Shoemaker's page (*http://www.netline.net/~austin/cops/cops.html*), you can see how the new Open dialog box in Copland (now called Mac OS 8) makes it easier to open and switch between folders and files.

CLOSEST YOU'LL GET TO A MAC ENCYCLOPEDIA

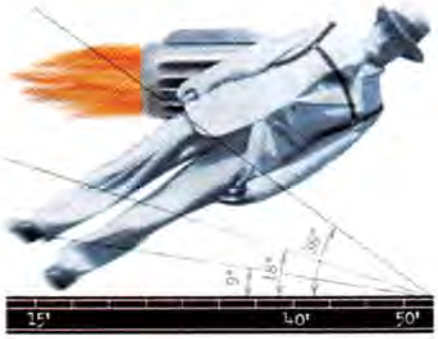
not found on his page—although that seems unlikely, since you can link to archives at the University of Michigan, the University of California at San Diego and at Los Angeles, Apple, and the University of Texas. Harold offers an excellent list of Macintosh-related trade shows.

Everything Macintosh, at *http://www.cs.brandeis.edu/~xray/macalt.html*, was created by Nathan Raymond specifically because of the poor way in which Netscape Navigator 1.X handles bookmarks (this has been improved in Navigator 2.0). It's like one of those amazing Greenwich Village bookstores where bibliophiles go to die. Want to link to Apple's Web sites? Sure. How about finding user groups worldwide, from the Hershey Apple Core in Pennsylvania to the Western Australia Macintosh Users Group? Interested in software development? Games? Newsgroups? The Apple II? Raymond's site offers all of these.

Other highly recommended compendium pages: Michael Yee's Ultimate Macintosh page at *http://www.freepress.com/myee/ultimate_mac.html*; University of Chicago astronomy professor Robert Lentz's Macintosh Web Resources from "The Rest of Us" at *http://www.astro.nwu.edu/lentz/mac/net/net-rest-of-us.html*; the Cult of Macintosh page at *http://cult-of-mac.utu.fi/*; and *MacSense*, an E-zine devoted to the Mac, at *http://www.precursor.mb.ca/macsense/default.html*.

Finally, for a completely biased look at how Macs are being used and should be used, I recommend dipping into Kathy Gill's MacFacts at *www.halcyon.com/kegill/mac/*; she's compiled a bibliography of articles from the mainstream and technical media about the Mac OS and its obvious superiority to Windows 95.

Oh, and there's also a site that we especially like—you can find it at *http://www.macworld.com*.



MACINTOSH TECHNOLOGIES

ONE OF THE first things I learned about technology is that it's like a movie—if you come in after it's started, just sit down and pay attention. Before long, you'll figure out what's going on. You might feel that if someone's rattling on about QuickTime VR on the Web, and you didn't even know about QTVR on the desktop, it's too late for you. Not true. Some Macintosh-specific technologies, such as QuickTime, are best discussed on Apple Computer's Web sites. For technologies that are egalitarian, like the Internet, or new, like virtual reality, there are independent, informative Web pages.

Internet

If you associate Archie and Veronica with comic-book characters, rather than Internet search tools or databases, the Internet Literacy Consultants' page at *http://www.matisse.net/files/glossary.html* should be your first stop. This excellent glossary will teach you the meaning of, and make you one of, the *digerati* ("The digital version of literati . . . people seen to be knowledgeable, hip, or otherwise in-the-know in regards to the digital revolution"). Also check out the Internet Services Directory at *http://www.comvista.com/FrontDesk.html*; its list of special topics includes running Unix on a Mac and becoming an Internet service provider.

World Wide Web

To delve into the technical underpinnings of the Web, start with the World Wide Web FAQ at *http://www.boutell.com/faq/*, which provides a wealth of basic information about URLs, getting browsers, setting up servers, and building your own Web page. For more specific information on Web publishing, you can't go wrong at *http://www.thegiim.org* or *http://www.cwru.edu/help/introHTML/toc.html*, tutorial sites from the Global Institute of Interactive Media and Case Western Reserve University, respectively. The institute's page offers tips categorized by occupation, such as educator, small-business owner, professional, and public official. Case Western's Introduction to HTML covers everything from tags and text structures to anchors and images.

Finally, when you've created your Web page, visit *http://www.winternet.com/~jmg/TopTenF.html*, which conveniently lists the "Top Ten Ways to Tell if You Have a Sucky Web Page," courtesy of Jeffrey Glover. Some examples: you show your résumé, your pets, and construction icons ("I think we *all* know that pages are always under construction").

Networking

Unlike with some technologies, you won't find too much on the Web specifically about Macintosh networking. The best site I found was *http://oak.forest.net/anma/anma.html*, from the Apple Network Manager's Association. The group is still regional, with chapters in Seattle; Palo Alto, California; and Toronto. Its site features job postings, an Open Transport Q&A page, and information on AppleTalk's routing and tunneling extensions.

For more networking information, head to *http://tampico.cso.uiuc.edu/nas/nasb/mac.html*, put together by the folks in the Computing and Communications Services Office at the University of Illinois at Urbana-Champaign. Mark Sproul maintains the "more than you'll ever want to know about Open Transport" page, while Lynn Ward has posted articles on topics such as installing MacTCP and NCSA Telnet for the Macintosh. Granted, some of what's on this page is specific to the University of Illinois network, but it's still helpful. There's also a glossary of Macintosh networking terms (originally from Cayman Systems) and a list of Usenet newsgroups relating to AppleTalk and Macintosh communications.

OpenDoc

Strangely enough, the best information about Apple's cross-platform strategy can be found not on the page for Component Integration Laboratories at *http://www.cilabs.org*, which is in charge of OpenDoc, but rather at *http://www.acl.lanl.gov/sunrise/DistComp/OpenDoc/overview.html*, maintained by Jim George who is affiliated with the Advanced Computing Laboratory at Los Alamos National Laboratory. Go figure.

THE LAST WORD

When Neil Armstrong walked on the moon, someone suggested that his feat wasn't so amazing—what was amazing was that millions of people sat in their living rooms and watched him do it. Today, the idea still holds true. It's not so amazing that sitting on our desks are machines that are more powerful than IBM's first mainframes—what's amazing is that using those machines, we can find out anything we want to know about how they work. **m**

There's a Right Way and . . .

Top ten tips from Web denizen Jeffrey Glover (*http://www.winternet.com/~jmg/TopTenF.html*) who, with tongue in cheek, explains what not to put on your Web page (later he explains what to do to improve your Web page).

Senior editor HOWARD BALDWIN has had an Internet address since 1989, but he should talk—he hasn't even built his own Web page yet.

Secrets

Clip and Save (Time, Keystrokes . . .)

CLIPPING FILES ARE CUTE—BUT WHAT CAN YOU DO WITH THEM?

by Joseph Schorr

System 7.5's drag-and-drop capabilities are, if nothing else, intriguing. There's a certain pleasure in dragging words, pictures, and sounds from, say, the Scrapbook, and watching as stand-alone text, picture, and sound clipping files appear on the desktop. But you have to wonder about the practicality of these little files. Yes, you can make clippings with a simple flick of the wrist, but what can you *do* with them? Can they actually save you time and help you do work—or are they just a cute and clever System 7.5 novelty? Read on for a few practical ways to make clipping files work for you.

Speedy Reference Documents

Suppose you frequently consult a document—say, a Read Me file containing a set of instructions, an agenda, or a phone list. Turn it into a text clipping, and you can look up the information whenever you need it, without launching a separate program—saving you time and conserving RAM. Because you read text clippings with the Finder itself, opening them is much faster than launching a word processor such as SimpleText; even launching the Note Pad or Stickies takes longer (and requires more RAM). And this technique works on more than just snippets of text; a clipping file holds up to 32K—about four times the text in this month's *Secrets* column. For that matter, you can drag a picture from the Scrapbook to create a quick reference graphic.

Drag-and-Drop Scissors

To create a text clipping, open a text document using SimpleText—or a drag-and-drop-aware program such as ClarisWorks 4.04 or WordPerfect 3.5—and drag the selected text you want to extract to the desktop. (A program that's fully drag-and-drop-aware allows you to drag selections not just between documents, but from a document onto the desktop, and vice versa.) This creates a new desktop clipping file with the generic name "text clipping." Just rename the clipping to reflect its contents.

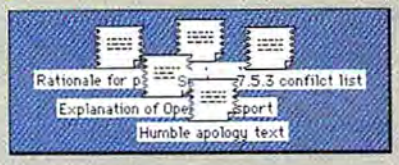
You can leave the clipping on the desktop (double-click to open it); add it to the Apple Menu (drop it into the Apple Menu Items folder); or with System 7.5.1 or later, drag it straight to the Launcher to create a button that opens the clipping with one click. Of course, you don't have to drag text to the *desktop* to make a clipping; you can drag it into any Finder window or onto a folder icon.

continues

RICHARD DOWNS

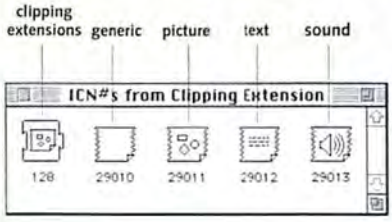
Slimmer, Trimmer Clipping Files

ONCE YOU DISCOVER THE JOY of using clipping files to capture and shuttle information from program to program, you may be tempted to drag and drop text like crazy—until you wind up with a desktop littered with clipping icons. For a less cluttered look, you can use ResEdit to create iconless clipping files.

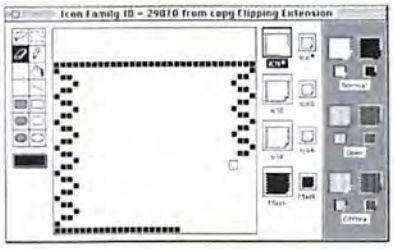


1 Make a copy of the Clipping Extension file, located in System Folder: Extensions, and open the copy with ResEdit.

2 Double-click on the ICN# resource icon to open the file's five ICN# resources.



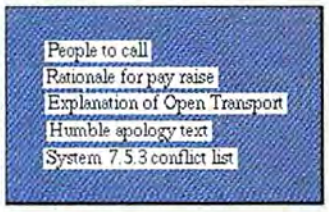
3 Double-click on resource 29010 to open the icon editor, then erase the current icon so that the drawing field is completely blank (double-clicking on the Eraser tool erases the whole icon automatically). Now drag down the



topmost blank box (labeled ICN#) and drop it on the box labeled icl8 to erase that icon as well (A). Repeat this drag-and-drop procedure with all the other icons in the dialog box, including the two labeled Mask, so that they are all blank. The result will be a totally invisible icon, as shown by the preview (B). Close the dialog box.

4 Repeat step 3 for resources 29011, 29012, and 29013. When you're done, save your changes and close the file. Don't worry about resource 128, which is the icon for the clipping extension file itself.

5 Replace your old Clipping Extension with the edited copy, and restart. From now on, new clipping files materialize on your desktop with names but no icons, so you can arrange them more compactly. Double-clicking on the name opens the clipping file.



To make a text clipping from a document created with a program (say, Microsoft Word) that doesn't support full drag-and-drop, copy the desired text and paste it into the Note Pad, a Stickies note, or the Scrapbook; from there drag the text onto the desktop. To turn a read-only file (such as a Read Me file bearing the standard newspaper icon) into a clipping, you must first open it using the Open command from within a word processor *other than* TeachText or SimpleText and then drag the contents to the desktop (or, if necessary, copy the text into a program that allows you to drag to the desktop).

Clip Now, Organize Later

I know a guy who collects jokes over the Internet. Because he uses Claris Emailer—a program that supports full drag and drop—he can clip and save his jokes almost effortlessly. Every time he gets a piece of E-mail containing a joke, he just drags the text containing the joke directly into a folder named Jokes on his desktop. This approach eliminates the need to copy and paste text. Rather than saving entire messages with lots of extraneous information, he quickly extracts each joke and saves it as a clipping for future reference. You can use the same technique to collect information from a number of documents, dragging and dropping individual paragraphs and sentences to the Finder as soon as you locate them.

If you gather information this way, you'll be able to turn your folderful of individual clippings into a single document with ease. Open a new document in a drag-and-drop-aware word processor, select all the clipping files, and drag them en masse to the document. If you want the clippings to appear in a specific order, select them one by one (by shift-clicking), in the order you want them to appear. When you drag the files to the document, the word processor imports them in that order.

Even if your word processor isn't drag-and-drop aware, you can still transfer text from a clipping to another document. You can't select text in a clipping, but you *can* copy it. Open each text clipping, copy it (⌘-C), then switch to your word processor and paste (⌘-V).

Customized Clippings

Text clippings can contain two kinds of text—plain or styled. When you drag styled text to create a clipping, the formatting—font, size, and so on—is preserved. Drag plain text (such as text from the Note Pad), and it appears in a default clipping font. It may seem that you can't change this font; there's no Font menu in a clipping file. But it turns out the default clipping font is the font used for all text in Finder views. By choosing a new font in the Views control panel, you can view (but not truly reformat) text clippings in any font available in your system. **m**

Contributing editor JOSEPH SCHORR is coauthor of *Macworld Mac and Power Mac Secrets*, third edition (IDG Books Worldwide, 1996).

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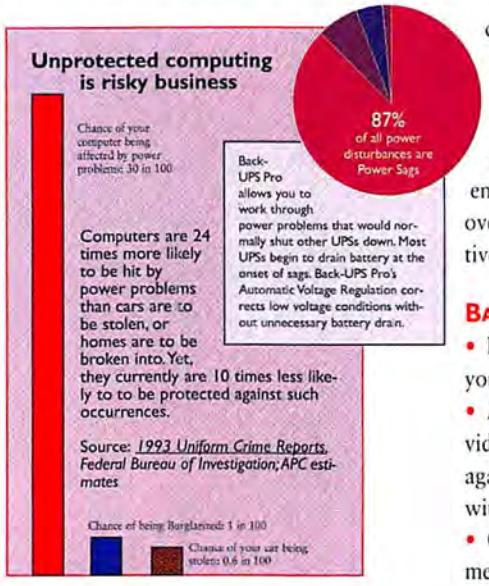

Unmatched Protection With Automatic Voltage Regulation

A study by Bell Labs indicates that 87% of all power disturbances come in the form of a power sag, or "brownout." Most UPSs begin to drain battery at the onset of sags, giving you a few moments to shutdown your computer. Automatic Voltage Regulation allows you to work through power problems by increasing voltage during brownouts and decreasing voltage during surges without draining battery power. In environments where chronic brownouts and overvoltages are the norm, the line-interactive Back-UPS Pro is essential.

Back-UPS Pro UPSs Feature:

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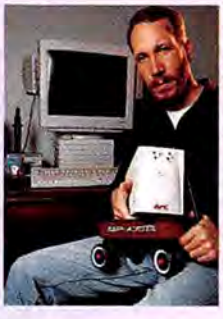
- CellGuard™ intelligent battery management dramatically extends battery life with fast recharge and deep discharge protection. Battery diagnostics warn you before problems occur.
- Batteries are quickly and safely user-replaceable without needing to shut your system down. (Batteries last 3-6 years under normal use).
- $25,000 lifetime repair/replace guarantee against surge damage to your equipment (see details).
- Built-in phone line/10Base-T network cable surge protection for a bulletproof response to anything Mother Nature sends in your direction.

So don't wait for the school of high shocks to teach you an expensive lesson about Mac performance. Ask for APC today.



More than 4,000,000 satisfied users say "Protect Me! with APC"

CLOCKWISE: "After 13 plus years in the computer industry (with both Apple and Digital), I have changed directions and now live in the Santa Cruz mountains, where the power is as bad as the view is beautiful," says Harald Striepe. "Now I spend most of my time consulting and writing fiction. The power is the worst during rainy season and brownouts are a daily occurrence. But, not a problem for me since I got my Back-UPS Pro with AVR - now, I work through the rainstorms."

"I am the Product Development manager for Radio Flyer," says Antonio Pasin. "But quite often, I work at home, where I pay for all the equipment....my TV has been zapped in the past (it turned GREEN!). Here, I don't have an extra $1200 to replace the DAT tape backup...an investment in APC is more cost effective for me. But besides just protecting the hardware, I look it it as protecting my media...I have lots of time invested in my data, and Back-UPS Pro protects that as well. Not to mention the unit is well-designed, easy to use, and APC provides great customer service to boot."

"I am a graphic designer/illustrator, using mostly 9500/132 and 8100/80 PowerMacs, in central Florida, the lightning capital of the world," said Thomas Sessions of Sessions Design in Orlando. "We lose power on a weekly basis and have constant outages....I've used APC for at least 8 years, but Back-UPS Pro is my current favorite - it has a smaller footprint and I can plug in my modem. Before UPSs, when we heard a thunderstorm, you would just hurry and try to get the work done, then just shut down- unplug the machines and take a break.....now I wouldn't work without one....particularly in this deadline oriented industry."

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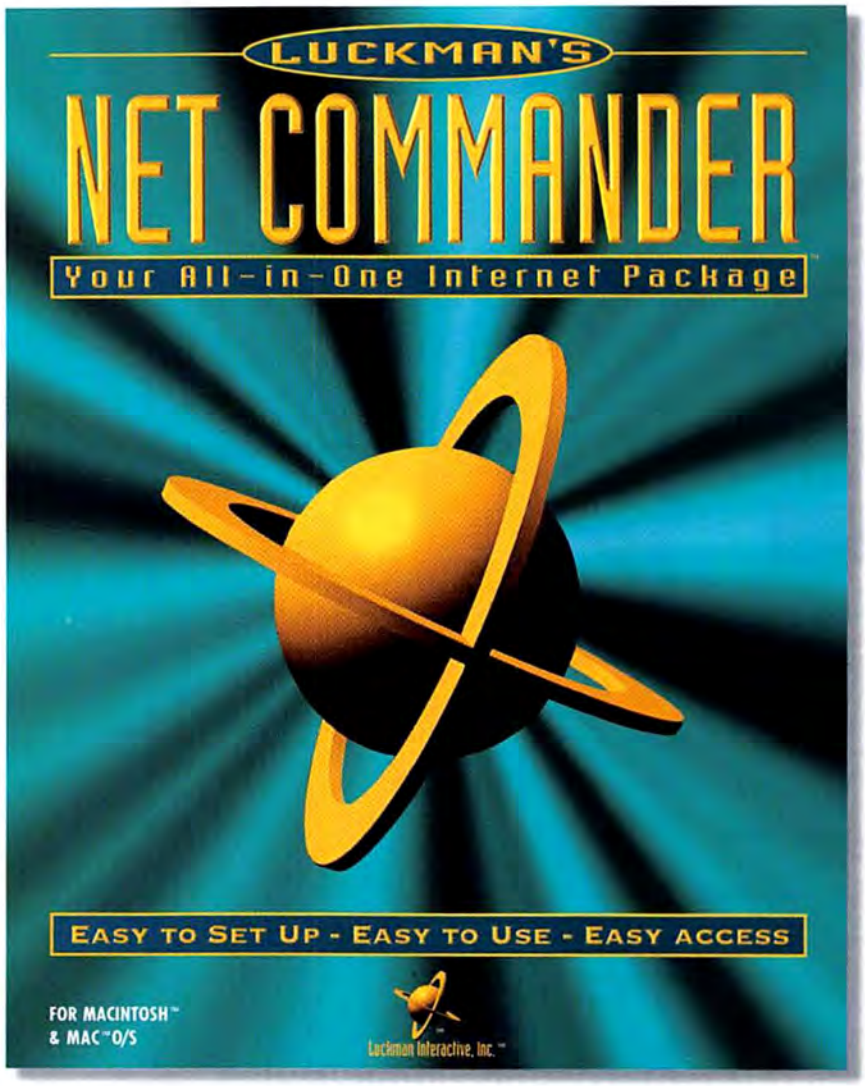

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Quick Tips

Tips, Tricks, and Shortcuts

by Lon Poole

Sometimes America Online refuses to open, complaining that it can't find its Online Database file even though the file is right where it's supposed to be (inside AOL's Online Files folder). This usually means the Online Database file is damaged. Ideally you could fix the problem by replacing the damaged file with a recent backup of it. If you don't have a recent backup, or if the backup is also damaged, you could reinstall the America Online software, but you'd have to sit through all those artwork downloads again. Martin Kaufmann of Waco, Texas, suggests that before doing that, you try resurrecting the Online Database file with ResEdit. Here's how: Open the Online Database file with ResEdit. Most likely ResEdit will tell you the file appears to be damaged and will offer to create a new file using undamaged resources from the Online Database copy. After ResEdit makes the new file, switch to the Finder and drag the old Online Database file to the Trash. Change the name of the new file ResEdit created from Online Database (the undamaged file) to Online Database. Now you should be able to launch America Online and connect. (According to America Online, version 2.7 of the AOL software can fix damaged online database files without resorting to ResEdit.)

Printing Two Sides

Q How can I automate double-sided printing? I am using Claris's FileMaker Pro, which cannot print only odd or only even pages.

CURT J. ZOLLER
Mission Viejo, California

A If you don't have QuickDraw GX installed (it comes with System 7.5 but is installed separately), use the utility ClickBook from BookMaker ($69.95; 415/354-8161, *http://www.clickbook.com*). In addition to simple double-sided printing, ClickBook can print multiple page images per side so you can print booklets and so forth. ClickBook works with FileMaker Pro and most other applications, but not with QuarkXPress or Adobe PageMaker. It works with all Apple and Hewlett-Packard laser and ink-jet printers, but does not work with Epson's Color Stylus line of printers.

If you do have QuickDraw GX installed (or want to install it), use Peirce Print Tools 1.0 from Peirce Software ($129, or mention Pierce's Web page and get it for $69.95; 408/295-9760, *http://www.peircesw.com/*). It adds nine new printing capabilities to every application (even if the application hasn't been updated to use the GX print dialog box), including double-sided printing, multiple pages per side, and watermarks. Peirce Print Tools works with all applications, and with all printers that have a GX driver. Most printers and fax-modem software have a GX driver; there's a list on the GX Fan Club's Web site, at *http://www.ixmedia.com/quickgx/gxdrivers.html*.

Mac Files through Windows

Q I am an avid Mac user, but am restricted by a workplace that has only PC access to the World Wide Web. I have no modem or online service with my Mac at home. Is Mac software downloaded to a floppy on my PC at work usable on my home machine? If so, what's the correct procedure?

DAVID STUBBLEBINE
Huron, Ohio

A Downloading Mac software and nontext document files on a Windows or DOS PC is no problem because in Internet archives most Mac files are encoded as plain text files, which can be transferred to and from almost every kind of computer. An encoded file's name has a suffix that indicates the type of encoding used on it. By far the most common suffix for Mac files on the Internet is .hqx, which indicates BinHex encoding.

After downloading, copy the .hqx encoded files to a PC floppy. Your Mac can read PC floppies as long as it has the PC Exchange control panel installed and turned on. (PC Exchange is a standard part of System 7.5.) If you download a file larger than 1.4MB to your PC's hard drive, you can use a PC word processor to save pieces of it on multiple PC floppies, and then use a Mac word processor to combine the pieces and save the whole file on your Mac's hard drive.

continues

JOHN BLECK

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Before you can open an encoded Mac file, you must decode it and in some cases decompress it. The free Mac utility StuffIt Expander from Aladdin Systems (408/761-6200, *http://www.aladdinsys.com/*) decodes BinHex-encoded files and, if necessary, expands files that were compressed prior to being encoded. StuffIt Expander also handles files whose names end with .sit, .cpt, or .bin. To handle files that end with .zip, .zrc, .pkg, .gz, .z, or .uu, you need Aladdin's $30 shareware DropStuff with Expander Enhancer.

You can get StuffIt Expander online as an encoded file (the only way Mac software can exist online), but you can't use it unless you can decode it. To circumvent this catch-22 (which is described in detail at *http://www.aladdinsys.com/obstufex.htm*), get a copy of StuffIt Expander on a floppy disk from a friend or a user group, buy one of the many Internet books that include it on a floppy or CD-ROM, or order it from Aladdin.

Control-Strip Control

Q Control Strip sits near the bottom of my Power Mac 7500's screen. Can I move Control Strip around the screen?

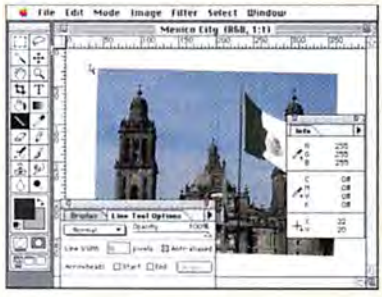
GREG CURRIE
Barrie, Ontario, Canada

continues

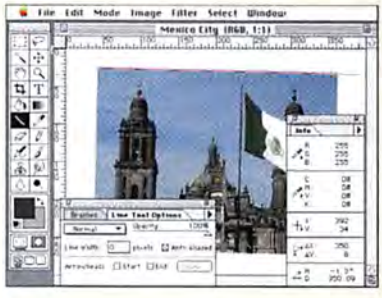
Fixing Crooked Scans

Here is a quick and painless way to straighten scanned images in Adobe Photoshop, contributed by Carla Michelini of New York.

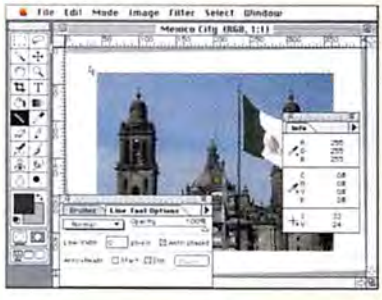
1. Select the straight line tool, and in the Options palette, set the Line Width to 0. Be sure to position the Info palette so you can see all of it when it expands to its full height. If the Info palette is hidden, display it by choosing Show Info from the Palette submenu (located under the Window menu).



2. Click at the top left corner of the picture, then drag to the top right corner as if drawing a rule across the top of the picture. Do not release the mouse button until you've noted or jotted down the angle displayed at the bottom of the Info palette. (When you release the mouse button, no rule actually appears because of the 0 line width.)



3. Straighten the picture with the Arbitrary Rotate command. In the Arbitrary Rotate dialog box (not shown), enter the angle you noted when you drew the invisible rule, and select a rotation direction. Enter the rotation angle as a positive number; entering a negative angle reverses the rotation direction.



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A Press the option key and drag to move Control Strip up and down. You can also move it to the opposite edge of the screen—but not to the middle; Control Strip must touch the edge of the screen. You can also option-drag items on Control Strip to rearrange them. On a Mac with Control Strip installed, Macintosh Guide (in the Guide menu when the Finder is active) has answers and step-by-step instructions for these and other Control Strip tips. Control Strip is normally installed on PowerBooks that have System 7.5 or later and on desktop Macs that have System 7.5.2 or 7.5.3. To use Control Strip on a desktop Mac with System 7.5.1 or earlier, use Robert Mah's free Control Strip Patcher, available from Macworld Online (*http://www.macworld.com*) and America Online (keyword *Macworld*).

Excessive System RAM

Q My PowerBook 160 came with 4MB of RAM. I maxed it to 14MB but don't have any more memory available for opening programs. The system software is now taking up more than 9MB of memory. How can I control the amount of RAM my system uses?

PEDRO JOSE LAHOZ
Torreón, Coahuila, Mexico

A You need to turn on 32-Bit Addressing in the Memory control panel and restart your Mac. When that option is off, the Mac OS uses 24-bit addressing and can access only 8MB of RAM, regardless of the amount actually installed. Any RAM over the 8MB limit is simply added to the System Software Total Memory bar—even though it's not being used—in the Finder's About This Macintosh window. Disk cache size and RAM disk size (if any) are two other Memory settings that affect reported system software size.

Autoclosing Find File

TIP After installing System 7.5.3, you can quit Find File while opening a found item by holding down the option key and double-clicking the item in Find File's Items Found window. This trick saves you the trouble of reactivating Find File in order to quit it.

MICHAEL ALLURED
Neshkoro, Wisconsin

The option-key shortcut also works with the Get Info, Sharing, Open Enclosing Item, and Print commands in Find File 1.1.2, which comes with System 7.5.3, and it also seems to work with earlier versions of System 7.5. When Find File 1.1.2 is active, you can read about scads more shortcuts by choosing Find File Shortcuts from the Guide menu.—L.P.

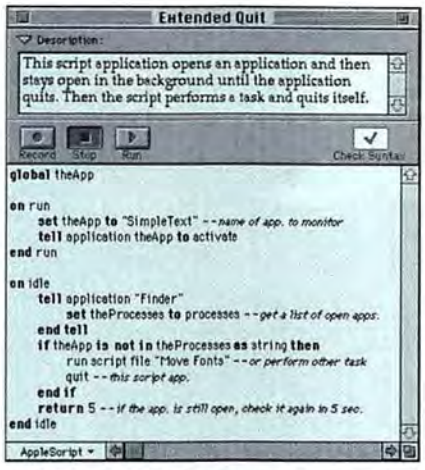
Printer Hygiene

TIP When my Hewlett-Packard DeskWriter 550C printer began having trouble pulling paper from the tray, cleaning the three gray paper-feed rollers using HP's method (water on a lint-free cloth) did not help. Here's what worked for me. I bought a metal nail file with a fine, sandpaper-like surface. (I did not use an emery board because I did not want to risk getting grit in the printer.) I removed the paper tray and lifted the printer cover, then held the nail file lightly against the bottom of each roller while running the printer through its start-up cycle. The rollers turn about one revolution during start-up; I restarted the printer twice for each roller. I worked on the bottom of the rollers because the print-cartridge carrier moves in front of the rollers as they turn. I then cleaned each roller with a water-dampened cloth using the same restart procedure. The printer now feeds paper like new. It can even feed a partly used 8½-by-11-inch label sheet.

TIM SPIVEY
Tifton, Georgia

Extended Quit

TIP Few programs let you change what happens when you choose Quit from the File menu, although you can use AppleScript to quit an application and then automatically perform tasks such as moving uncommonly used fonts out of the Fonts folder (see *Quick Tips*, May 1996). Hideyuki Fujioka of Bryn Mawr, Pennsylvania, has another method. Rather than trying to doctor the Quit command, Fujioka suggests creating an AppleScript application that approaches the problem from the other direction. First, the AppleScript application opens the application whose quit behavior you want to extend; second, the AppleScript application stays open in the background until the application it opened is closed; and third, the AppleScript application performs the desired tasks (moving fonts or whatever) and quits itself. "Quitting Time" shows a simple example. You create an AppleScript application with a script editor by saving a script with the Kind option set to Application and the Stay Open option turned on. Fujioka notes there are a couple of drawbacks you should consider before adopting this method: while open in the background, the AppleScript application occupies 200K of memory and may slow down the foreground process a little. Also, if you like to double-click Finder icons to open documents created by the application in question, you have to be sure to run the AppleScript application beforehand (perhaps by putting it in the Startup Items folder). **m**



Quitting Time This AppleScript application effectively extends the Quit command of another application. Customize the script by changing the name of the application (from *SimpleText* to your chosen app) and substituting statements (in place of the "run script file . . . " statement) to perform the tasks you want done at quitting time.

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Macs, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses.

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld System 7.5 Bible*, third edition (IDG Books Worldwide, 1994).

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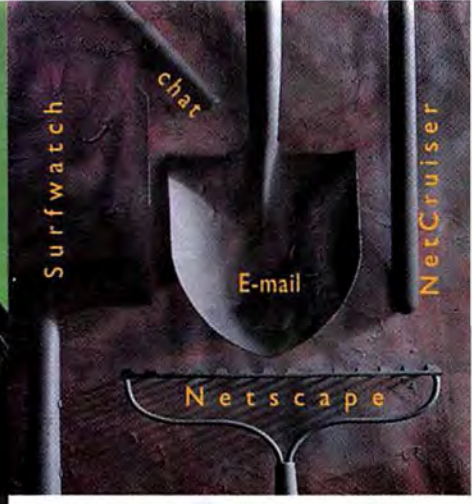

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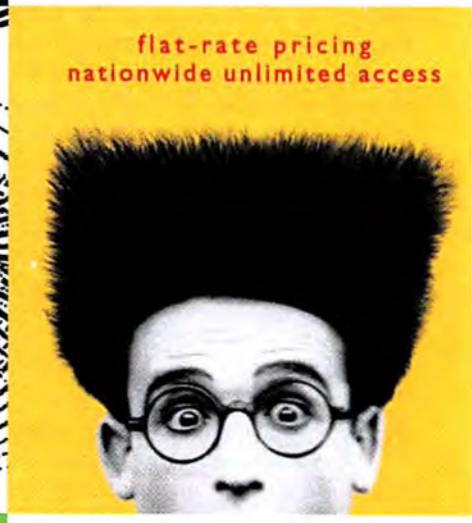

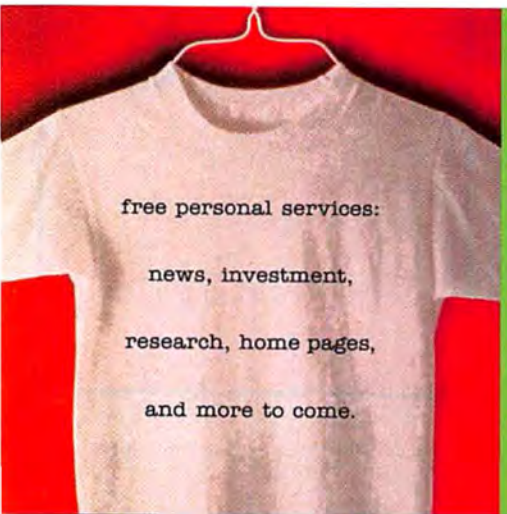

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NetSmart

Song of Myself: Personal Publishing on the Net

by Matthew Hawn

Forget Marshall McLuhan. The real patron saint of the Internet ought to be Walt Whitman. Whitman claimed his *Leaves of Grass* was "an attempt, from first to last, to put *a Person*, a human being . . . freely, fully and truly on record." I can't think of a better guideline for creating personal Web pages. Without personal pages, the Web is just another place to buy cubic-zirconium necklaces and designer chocolate. If the Net is going to be the virtual town hall promised by politicians and technology mavens, we need to populate it with the voices of individuals. We have to become creators as well as consumers of information.

Whether you are putting up pictures of your spelunking adventures in an abandoned underground missile silo (*http://www.xvt.com/users/kevink/silo/*) or your sardonic reviews of current movies (*http://internet-plaza.net/zone/mrcranky/*), the Web is a perfect place to exercise your First Amendment rights at a low cost.

Being a Net publisher doesn't mean you have to follow the prevailing consumer fetish for high-priced toys and the latest silicon. Since you're reading this magazine, you probably already have one of the best tools for publishing on the Net: a Mac. It doesn't have to be top of the line, it just needs to be online.

This Old Web Page

To get started, pull out a pencil and some paper. Sketch what you want on your Web pages. Think of your information as pieces in a 3-D chess game where each page is only a few clicks away from any other page—up, down, or sideways. Each hyperlink is both an exit and an entrance to another page.

Navigation within the 3-D space is important, particularly as your site grows. Every page should have a link back to the main or home page. It may not seem important to link all your pages when there are a half-dozen; but when that number grows to 50, as it surely will, you'll want a coherent, nonlinear way to browse this information. Create a hyperlinked table of contents or visual map of your pages, because people will browse it in different ways. It's also wise to include your E-mail address so people can contact you about your pages.

Once you have some idea of the scope of your personal Web space, it's time to start putting information into HTML. You can use a WYSIWYG application like Adobe PageMill or a shareware program like PageSpinner (see "Shareware Picks"), but you don't need them. You'll get a better understanding of how the Web works if you build your pages "by hand" using a text editor like SimpleText or a word processor to enter the HTML code. If you use a word processor, remember to save your HTML files as text-only—otherwise you'll inadvertently add some invisible formatting that will appear as gibberish on your pages.

Don't let HTML intimidate you. You can learn the basics in a few hours. (See "Web Worthy" for pointers to a few good HTML primers on the Web.) The best book for learning HTML is still Laura Lemay's *Teach Yourself Web Publishing with HTML in 14 Days* ($39.99; Sams.net, 1995; 317/228-4366, *http://www.mcp.com*). I also recommend using the "view source" feature on your Web browser to look behind the scenes and learn how your favorite Web pages are put together.

Be judicious in your use of graphics and multimedia objects. Despite the hype of multimedia, the majority of Web pages are still most effective as text mixed with static images. For tips on preparing graphics for your pages, see "Optimizing Web and CD-ROM Graphics," *Media*, May 1996.

Choosing a Publisher-Friendly ISP

Your final step as a personal Web publisher is to find a

continues

SUSAN LYVAN

server with a 24-hour connection to the Internet to host your pages. Servers are expensive—you'd have to pay several thousand dollars to establish and run a 24-hour server over a year—so nearly all personal pages live on space begged, borrowed, or rented from existing servers. If you are going to rent, it's probably cheapest and easiest to go with your Internet service provider (ISP). Most ISPs run a Web server that you can use; this hosting service can be part of your basic service, or you may have to pay a nominal fee. Even the commercial online services such as America Online and CompuServe offer space for publishing personal Web pages.

This comes with a caveat: Not all ISPs are created equal (see "Choosing an Internet Provider" in *Consumer Advocate*, elsewhere in this issue). You should be able to get detailed instructions from your ISP on how to post your Web pages to its server. You should also have a tech-support contact who can walk you through the process of posting your pages or who can point you to resources for personal publishers. More ambitious publishers might want to ask about ways to add interactivity, such as CGI scripts and forms for gathering information. The most common way of posting your pages to the site uses an FTP client (like Fetch, Jim Matthews's FTP shareware). You'll get a home-page URL (usually something like *http://www.host.com/~yourname/*).

Personal pages rarely require more than a few megabytes of storage space on the server. If your content really calls for multimedia treatment or you write like Tolstoy, you'll need more, and you'll probably have to pay a monthly storage fee (less than $5 per megabyte, per month) on top of the basic fee.

That's it. Follow these steps and you'll be a publisher and a homesteader on the virtual frontier. Update your pages regularly and link them to the people and places you like on the Web. In the final years of the twentieth century, our best shot for keeping independent and alternative voices alive in our increasingly milquetoasty mainstream media just might be the Internet, and especially the World Wide Web. Whitman, maybe the most democratic of poets, would have loved the Web's egalitarian potential. When you are building your page, take a minute to visit his home page on the Web, *http://www.columbia.edu/acis/bartleby/whitman/*. ■

MATTHEW HAWN's home page can be found at *http://www.well.com/~jukevox*.

Shareware PICKS

PageSpinner 1.1, by Jerry Åman of Optima System, is an HTML editor for creating Web pages. It is not a WYSIWYG application, so you will be working directly with HTML to build your pages.

But features like the HTML Assistant and good floating tool palettes save you from having to type out each tag or figure out certain formulas, such as the height and width dimensions of your images. PageSpinner supports all of the standard HTML tags (including text wrapping and tables) and many of the Netscape extensions to HTML (but not frames).

One of my favorite features is PageSpinner's use of colors and icons to distinguish HTML tags from text, and standard tags from nonstandard extensions. The interface supports drag and drop, uses the Mac's Color Picker for background and link colors, and contains examples and templates accessible within the application. My only complaint is the lack of keyboard commands for most of the formatting tools.

PageSpinner is $25 shareware (register via the Kagi shareware registry—*http://www.kagi.com*). You can find it in the Mentioned in Macworld section of our Web site.

GifBuilder 0.3.1, by Yves Piguet. GIF has long been the image format of choice for most Web pages, but on the go-go-go byways of the Net, you have to keep moving or get run down. Flashy multimedia is now all the rage, and so the tried-and-true but static GIF format was headed toward roadkill status until someone remembered that, with a little tinkering, GIF also supports multiple frames and thus animation. Netscape gave this GIF flavor (called GIF89a) a boost by supporting it in version 2.0 of Navigator. It doesn't require a plug-in, and thanks to some clever caching, it doesn't require multiple downloads the way a server-push animation does; it reloads from memory for looping effects.

Until the browser plug-in wars settle down a bit and we can see which animation plug-ins are worth downloading, I recommend the GIF89a format for adding animation to your Web pages. GifBuilder 0.3.1 is freeware, AppleScriptable, and lets you turn a series of static GIFs into an animation. Another reason we like the GIF89a format: when your browser doesn't support it, you see just the first or last frame of the animation, not a broken Web page or missing plug-in dialog.

You can get more information on GifBuilder and other GIF89a tools at Yves Piguet's Web page, *http://iawww.epfl.ch/Staff/Yves.Piguet/clip2gif-home/GifBuilder.html*.

Web Worthy

Justin Hall is the poster boy for personal Web publishing. His autobiographic Links from the Underground (*http://www.links.net*) is a classic mix of the digital introspection and extroversion that makes the Web a place with people in it, not just a virtual shopping mall. Pay special attention to his Publish Yo' Self page, *http://www.links.net/webpub/*.

For the nuts and bolts of page creation, start at Macworld Online's NetSmart section, *http://www.macworld.com/cgibin/netsmart.pl*. We've included a basic HTML lesson, tips for beginners just learning about Web publishing, and lots of links and Web resources.

As you get more experienced and want a one-stop site where you can find tools, tricks, and tips for Web-site construction, visit Bob Allison's Web Masters page, *http://miso.wwa.com/~boba/masters1.html*. It's a great collection of links to the latest HTML tools, CGI resources, and Web-server information.

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Model	ViewSonic PT810	Sony 20sfII	ViewSonic PT770	Sony 17sfII
Aperture Grille Pitch	0.30mm	0.30mm	0.25mm	0.25mm
CRT Size	21"	20"	17"	17"
Viewable	20.0"	19.1"	16.0"	16.0"
Horizontal Scan Rate	30-96 KHz	30-85 KHz	24-82 KHz	30-65 KHz
Maximum MAC® Resolution	1600x1200	1280x1024	1280x1024	1024x768
Color Control	Yes	Yes	Yes	No
CRT Warranty	3 Years	2 Years	3 Years	2 Years
MSRP*	$1,995	$2,299	$945	$1,099

* MSRP as of May 1, 1996. Prices and specifications subject to change without notice.

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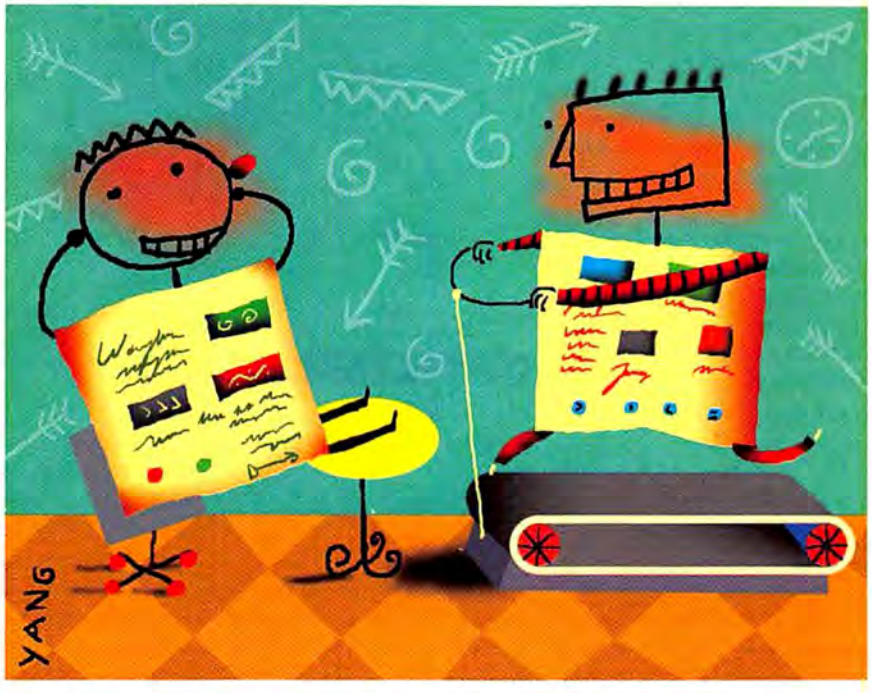
Circle 59 on reader service card

Media

Server-Friendly Image Maps

TAKE A LOAD OFF YOUR WEB SERVER WITH CLIENT-SIDE MAPS

by Jim Heid



JAMES YANG

You can't be all things to all people, yet Web-site developers are asked to be exactly that every day: Take advantage of all the Netscape extensions to HTML, but also make sure your site works in other browsers. Include graphics on your site, but don't leave out people with text-only browsers. Use Shockwave animations, but don't ignore surfers who don't have the plug-in. Pressures like these are enough to make you empathize with a politician. Almost.

It's a rare moment in Web publishing when you can combine forward-looking design with backward compatibility. *Client-side* image maps allow for this happy combination.

Last month, I covered conventional, or *server-side*, image maps—those graphics on which Web-site visitors can click to navigate your site. Server-side maps impose a performance penalty on the server because they require it to translate coordinates received from a browser into the address of a specific page—even when a visitor clicks on part of a map graphic that isn't hot.

Client-side maps aren't so lazy. Instead of beaming the server a set of numbers and making it figure out where to go, the browser knows which coordinates correspond to which hot spots. Click on a hot spot, and the browser sends the server an URL. By putting the coordinates and their links into the HTML page itself, client-side maps let servers concentrate on, well, serving.

Another benefit: you can test Web pages containing client-side maps by opening them from a local hard drive—to test a server-side map, you must actually upload pages to a Web server and install the CGI application that handles the image map.

Client-side maps even have a user-interface benefit for Web surfers: where server-side maps show a bunch of changing coordinates at the end of the URL in the browser window's status area, a client-side map shows the exact address of each hot spot as the mouse pointer moves over it—as for any link (see "Show Me Where I'm Going" in the sidebar). And there's no risk of a Web surfer's clicking on a dead spot, as there is with client-side maps: when the mouse pointer isn't over a hot spot, no link appears at the bottom of the browser window.

Here's the best part: you can support both kinds of maps in one HTML docu-

A Field Guide to Client-Side Image Map Tags

SUPPORTING A CLIENT-SIDE IMAGE map involves adding some extra HTML tags to a Web page. Here's a field guide to the tags you'd need in order to turn last month's server-side map into a client-side map. To see them in action, check out Macworld Online (*http://www.macworld.com*).

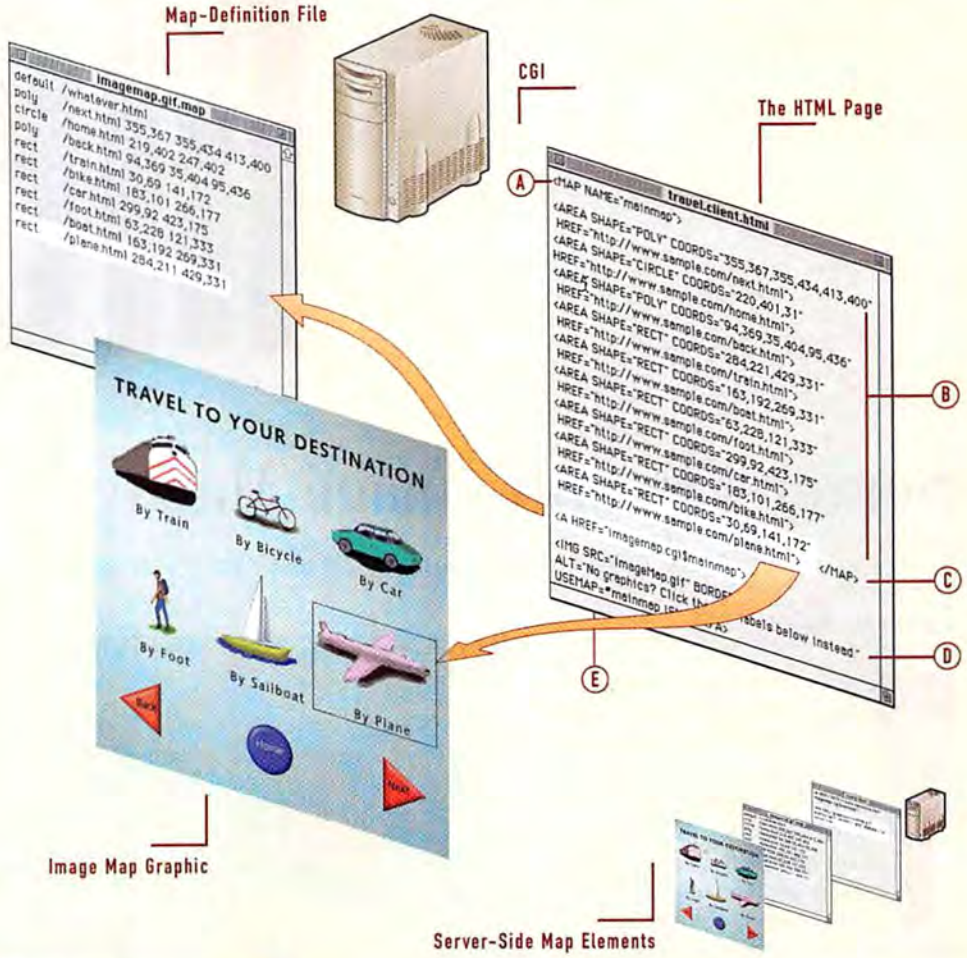
(A) The **MAP** tag denotes the beginning of the client-side image map's definition. The **NAME** tag that follows gives the definition a name you'll use when referring to the map in the **USEMAP** tag, described in E.

(B) In a client-side image map, each hot spot's coordinates and link reside directly within the HTML page, not in a separate map-definition file as they do with server-side maps. Client-side maps support three shapes: polygons (**POLYGON**, also abbreviated **POLY**), circles (**CIRCLE**), and rectangles (**RECT**). The **CIRCLE** tag's three attributes reflect the location of the circle's center point and the circle's radius (see "Notes and Tips").

(C) After defining each hot spot, end the definition with the **</MAP>** tag.

(D) The rest of the HTML code looks much like its server-side counterpart, with good reason: this code also supports a server-side map for use with browsers that don't support client-side maps. An anchor element contains an **HREF** tag that points to the server-side CGI and to the map's graphic, and an **ISMAP** tag that tells the browser to treat the graphic as an image map.

(E) But the code also contains a **USEMAP** tag, which tells a client-side–aware browser to use the map definition whose name appears after the pound sign (#). See "Notes and Tips" for a variation on this theme.



NOTES AND TIPS

Eliminate the SHAPE tag

The **SHAPE** tag is optional; if you eliminate it, the browser assumes that the shape is a rectangle (**RECT**).

Run circles around PageMill

I mentioned elsewhere that you can copy the coordinates for a client-side map from a server-side map-definition file. However, if you use Adobe PageMill to create the map-definition file, you'll encounter a problem relating to circles: a PageMill-generated map-definition file describes circles as ovals, using four values that define the upper-left and lower-right coordinates of the circle's bounding box. The **CIRCLE** tag, however, requires just three values, two to define the center of the circle in relation to the upper left corner, and one to define the radius of the circle. Thus, PageMill-generated coordinates won't work for circles in client-side maps.

The solution? You can either use Adobe Photoshop's Info palette to extract the circle's coordinates laboriously, or use WebMap, by Rowland Smith ($20 shareware, *http://www.city.net/cnx/software/*). WebMap provides separate tools for circles and ovals, and the map-definition files it generates describe circular hot spots correctly.

Store hot-spot definitions in a separate document

In this example—and in the vast majority of client-side maps on the Web—the hot-spot definitions are stored within the same HTML page that displays the map graphic itself. But you can also store the definitions in a separate file; it is a good idea to do so if you use the same image map in a number of pages. If you store the definitions in a separate file, change the **USEMAP** tag to include the file's name (for example, **USEMAP="maps.html#mainmap"**).

Include alternate text

Since some users have text-only browsers, and others disable font downloading, it's always a good idea to include an **ALT** tag with accompanying text labels. This tag instructs visitors to use the labels (not shown here) for navigation.

Use POLYGON instead of POLY

Netscape Navigator and Microsoft Internet Explorer recognize the **POLY** tag as an abbreviation for **POLYGON.** However, Spyglass Mosaic doesn't recognize **POLY** and ignores any hot spots defined with it. Thus, for complete compatibility with browsers that support client-side maps, use the **POLYGON** tag.

ment. Browsers that support client-side maps—Netscape Navigator 2.0, Microsoft Internet Explorer, and Spyglass Mosaic—use them, while other browsers use the server-side map. Thus, there is no excuse not to include support for client-side maps on a Web site. As always, you can find examples and links to additional information on my Web site, *http://www.heidsite.com*.

On Your Client's Side

The secret to client-side maps is to add some extra HTML tags to the page that contains the image map (see "A Field Guide to Client-Side Image Map Tags"). One set of tags defines the coordinates of each hot spot as well as the hot spot's destination. These tags do the job performed by a map-definition file in server-side maps. The key player in this set of tags is **MAP**, which tells the browser that a collection of coordinates and links is on the way.

The other new tag is **USEMAP**, and it goes within the **IMG** tag that references the image map's graphic. Now here's the cool part: to support both client- and server-side maps, you simply use both the **USEMAP** tag and the **ISMAP** tag (the latter is used with server-side maps). A browser that supports client-side maps will use the **USEMAP** tag, while the others will use the **ISMAP** tag.

So how do you create the client-side tags? Two free, AppleScript-based programs convert server-side map-definition files into client-side tags: Jeff Barnum's MapConvert and Andreas Heissenberger's ClientMap Converter. The University of Iowa's Arachnid, a freeware HTML page-creation program, supports both server- and client-side maps. (You can download all three programs from America Online as well as my Web site.) Adobe's PageMill and SiteMill don't support client-side maps, but Astrobyte's (303/534-6344, *http://www.astrobyte.com*) $595 BeyondPress, an impressive package that turns QuarkXPress into a Web-page editor, supports both types of maps.

If you don't use BeyondPress, you have to add the tags to your pages by hand, using a text editor. But if you're also supporting server-side image maps (and you should be), there are plenty of tools available for creating map-definition files. These utilities range from the shareware WebMap ($20, by Rowland Smith; *http://www.city.net/cnx/software/webmap.html*) to commercial packages such as Adobe's PageMill and SiteMill (*http://www.adobe.com*). Once you've got a map-definition file, you can at least extract each hot spot's coordinates—the format is the same for both types of image map.

Other Graphic Navigation Strategies

Client-side maps provide a better user-interface experience than server-side maps, but they still don't fully address the visual-feedback issue. In a CD-ROM title, buttons highlight or otherwise change when a user clicks on them. An image map can't do that. Technologies such as Macromedia's Shockwave for Director and Sun Microsystems' Java allow for multiple-state buttons but induce their own headaches: limited browser support, a high memory overhead, and a steep learning curve.

One simple technique provides at least some visual feedback in the Mac versions of Netscape Navigator and Microsoft Internet Explorer: forgo image maps in favor of multiple separate graphics with borders. The aforementioned browsers alter the border's color when the graphic is clicked on (see "Can I Get Some Feedback on That?").

You can combine this strategy with HTML 3.0 tables to position graphics alongside one another. But don't go overboard. Navigator and Explorer can open several connections to a server to retrieve multiple graphics more or less simultaneously. This can bog down the server and therefore slow your site.

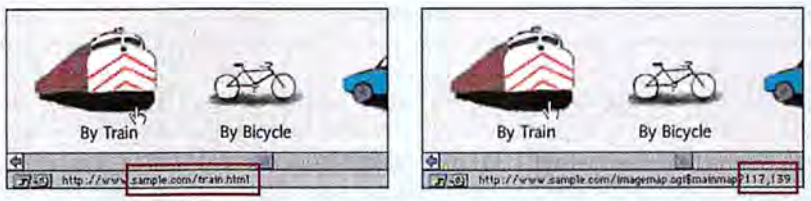
If you've got more than about five graphics, it's best to use an image map—one that works from both the client side and the server side. There aren't many areas in Web development where you can support two dramatically different approaches in a single page. This is one—take advantage of it. **m**

Next month: Web-site animation

Contributing editor JIM HEID produced the interactive CD-ROM that accompanies his *Macworld New Complete Mac Handbook*, fourth edition (IDG Books Worldwide, 1995).

CAN I GET SOME FEEDBACK ON THAT?

On a CD-ROM, buttons and other hot spots change state—they highlight, for example—when you click on them. A Web-site image map can't provide this feedback. But by using client-side image maps or separate graphics, you can provide at least a measure of feedback.



Show Me Where I'm Going A client-side image map (left) enables a browser to indicate where a given hot spot will lead visitors. This also enables visitors to discern the hot spots—no link appears at the bottom of the browser window when the mouse pointer isn't over a hot spot. With a server-side map (right), all Web visitors see is a set of numeric coordinates, which appear even when the pointer isn't within a hot spot.

Flash When I Click on You Mac browsers highlight a hyperlinked graphic's border when you click on the graphic. (Oddly, the Windows versions of these browsers don't highlight the border.) You can take advantage of that fact to provide a bit of visual feedback. Instead of creating a single bitmap for an image map, keep graphics separate and don't use the **BORDER=0** attribute in your HTML page. The browser creates a border by drawing a box around the graphic, so this technique generally works best with square or rectangular buttons. In this example, clicking on the button image changes the border color from blue to green.

Publishing Workshop

Brush Up on Indents, Start Using Them Now

by David Blatner

Not long ago, I got a call for help from a designer friend who was working on a brochure containing a long list of bulleted items. Some items were short—just one line long. Others, however, spanned several lines. "I don't mind incorporating the client's changes to the one-liners," she told me, "but the longer items take forever to alter." It took me a few minutes before I understood her problem: she had no idea how indents work.

What's worse, I've discovered that this problem is epidemic in the desktop publishing industry. With just two minutes of instruction, she was able to double her productivity on this job. If you're in her boat, it shouldn't take you much longer than that to read this article and reap the same benefits. (For more information, check out *Beyond the Mac Is Not a Typewriter*, by Robin Williams; $16.95; Peachpit Press, 1996; 510/548-4393).

Left, Right, and First

Almost every program on the Mac that lets you handle a paragraph of text gives you three indent controls: left, right, and first line. These controls always affect an entire paragraph.

The text always wraps between the left and right indents, so these can appear to be margins. However, the left and right indents are *not* the same as page margins. If you want to change a margin at the top, left, right, or bottom of your page, you should do so elsewhere in the program.

An indent of zero doesn't mean the text will print at the edge of the paper. In word processing programs, a zero indent means the text starts at the left margin and wraps at the right margin. In page-layout programs (like QuarkXPress and Adobe PageMaker), a zero indent means the text wraps from the left side of the text box all the way to the right side.

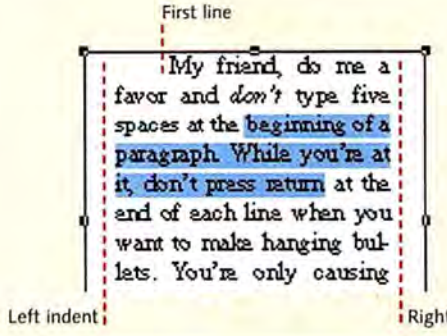
You can change the indents for a paragraph by typing numbers in the paragraph formatting dialog box (in XPress, you can bring up the dialog box with ⌘-shift-F; in PageMaker and Microsoft Word, you use ⌘-M) or by dragging the indent triangles in the text rulers. QuarkXPress shows you the text ruler only when the Paragraph Formats or Paragraph Tabs (⌘-shift-T) dialog box is visible; in PageMaker you have to have the Indents/Tabs dialog box open (⌘-I). In Word, you can display the text ruler at any time (⌘-R).

Splitting Hairs

While the left and right indents control the entire paragraph, a first-line indent affects only the left side of the paragraph's first line. If you're

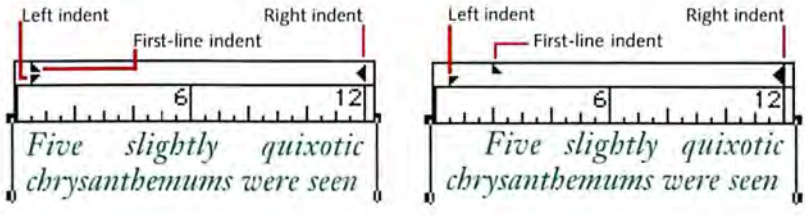
PRECISION INDENTS

ALMOST EVERY PROGRAM that handles text lets you specify a left, right, and first-line indent for each paragraph. QuarkXPress's dialog box is typical.



Hands-on Indents

While you can always specify paragraph indents numerically in a dialog box, some people like the touchy-feely approach to setting indents. Drag the tiny triangles to get the look you want.



still in the habit of typing a tab at the beginning of each paragraph, *stop it*. Instead, give the paragraph a first-line indent.

You can apply a first-line indent either numerically in the dialog box, or manually in the text ruler by dragging the top half of the left-indent triangle (at least, this is how it works in most programs). Typically, when you drag the lower triangle (which determines the left indent of the paragraph), the first-line indent triangle moves, too, because the first-line indent is always *in relation* to the left indent. You can move the left-indent triangle independently in PageMaker and Microsoft Word by holding down the shift key as you drag. Unfortunately, in QuarkXPress, you can't move the left-indent triangle by itself—the first-line indent triangle always moves along with it.

Hanging Indents

The coolest thing about a first-line indent is that it doesn't have to indent *into* the paragraph (to the right)—you can also indent out of the paragraph (to the left). This makes it very easy to create bulleted or numbered lists, and other typographic designs that require hanging indents.

Remember that the first-line indent can't push the paragraph past the left edge of the text block. If you have a left indent of 0.25 inch, you can have a negative first-line indent (up to –0.25 inch where the first line would be at zero), but not –0.3 inch, and so on. But if you specify a left indent of zero you can't have a negative first-line indent at all.

Other Techniques

There's more than one way to skin an avocado. For instance, if you want a hanging bullet in QuarkXPress, you could type this at the beginning of the paragraph: bullet, tab, and the Indent Here command (⌘-\). But the negative-first-line indenting technique works better because you can save it in a style sheet and thereby apply it quickly to many paragraphs (it's also more flexible if you choose to change your design later).

Ninety-nine percent of the time, you should use the simplest method available for whatever you're trying to create. That means using simple but powerful tools—like indents—rather than complicated ones—like typing five spaces at the beginning of each paragraph. If you're still using typewriter techniques, you're just not being efficient. **m**

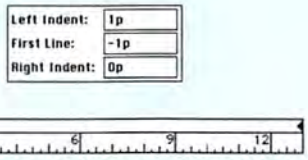
DAVID BLATNER, who wrote the tips in the Tip of the Day XTension in Extensis's QX-Tools package, can be reached by E-mail at *david@moo.com*.

One-Step Hanging Indents

THERE ARE SEVERAL WAYS YOU MIGHT USE hanging indents—for bulleted or numbered lists, for bits of dialogue, any time you want the first line (or first element) of a paragraph to extend beyond the left edge of the paragraph. It's tempting to achieve the effect by typing a return at the end of each line and extra spaces at the beginning of the next. But there's a better way: give the paragraph a positive left indent and a negative first-line indent.

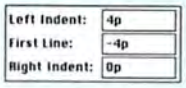
For example, to create a list with hanging bullets, you might give the paragraph a left indent of 0.25 inch (1.5 picas), and a first-line indent of –0.25 inch (the exact numbers you use depend on the size of your bullets and the space you want after them). Then you type a bullet followed by a tab at the beginning of the paragraph. Note that in PageMaker you must explicitly specify a tab stop at the 0.25-inch mark. QuarkXPress and Microsoft Word let you skip this step because the tab automatically jumps to either the first tab stop or the left-indent marker (whichever comes first).

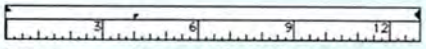
A standard numbered list.



1. Place the cursor in the paragraph you'd like to affect.
2. Open the Paragraph Formats dialog box in whatever program you're using.
3. Type in a positive left indent and a negative first-line indent.
4. Press OK.

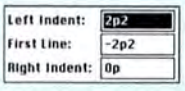
A negative first-line indent; a tab follows each character's name.

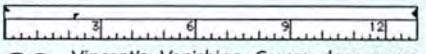




Banquo How goes the night, boy?
Fleance The moon is down; I have not heard the clock.
Banquo And she goes down at twelve.
Fleance I take't, 'tis later, sir.

A negative first-line indent; the first character is an in-line graphic, followed by a tab.





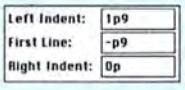
Vincent's Vanishing Cream does some amazing things to your complexion.

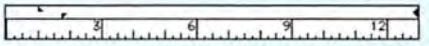
Smiling Sarah's sun-dried apricots are filled with the natural goodness of a summer day.

The eyebrows have it—improve your range of facial expressions with Edward's Eyebrow Exerciser.

You are getting drowsy. Hanks Hypno Helper promotes sleep without pills!

Slightly indented hanging bullets.





- *Macbeth*, by William Shakespeare
- *God in Search of Man*, by Abraham Joshua Heschel
- *When Bad Things Happen to Good People*, by Harold S. Kushner
- *Gödel, Escher, Bach: An Eternal Golden Braid*, by Douglas R. Hofstadter

Graphics Workshop

Designing an Image for Use on the Web

by Cathy Abes

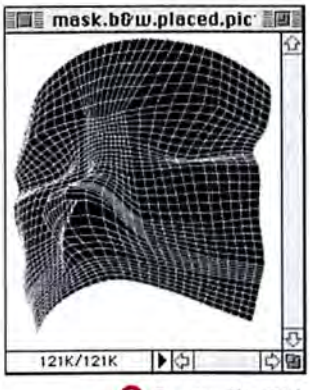
ARTIST Matthew Peacock, through his Philadelphia-area digital design studio, [anonymous] productions (*http://www.anonymous1.com*), creates 2-D and 3-D imagery for print, interactive multimedia, and World Wide Web sites.

HOW IT WAS DONE Peacock designed this image for the home page of Odyssey Systems, a commercial Web-site provider. He began with a 72-dpi image in 24-bit mode, which gave him flexibility in manipulating color; for example, he could apply Photoshop filters (not possible in 8-bit). He later converted it to 8 bits for optimal on-screen performance. Using DeBabelizer to create a custom 8-bit palette minimized color loss, so the final image looked very close to the original. Peacock saved the final image in Interlaced GIF 89a format, which, unlike previous GIF versions, let him create a transparent background for the images.

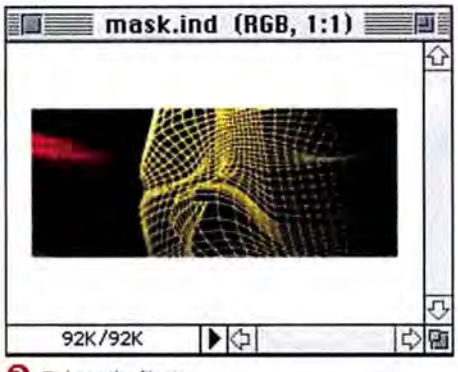
He created both a custom palette and a Windows-optimized palette to compare color quality (see "Optimizing Web and CD-ROM Graphics," *Media*, May 1996). Although the custom palette looked slightly better on his Mac, he chose the other because he expected mostly Windows users to view the Web site.

To ensure that the final image would load quickly (in less than 10 seconds using a 14,400-bps modem), Peacock kept it under 40K and no wider than 470 pixels.

THE TOOLS **Hardware:** Power Mac 7100/66; 32MB of RAM; 500MB internal hard drive; external Iomega Zip drive; Sony Multiscan 15sf 15-inch monitor. **Software:** Adobe Illustrator 5.5; Photoshop 3.05; Equilibrium DeBabelizer 1.5.5; Specular Infini-D 3.01; Amapi 2.05. **m**

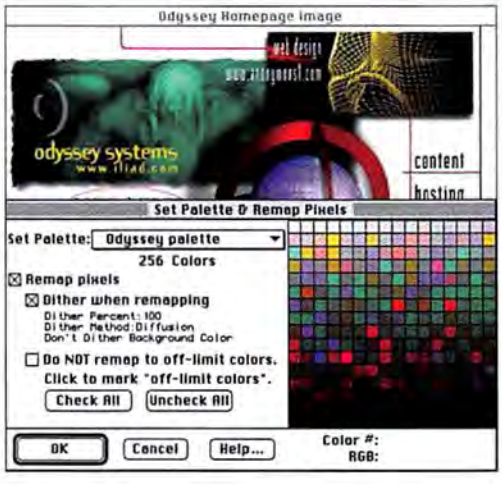


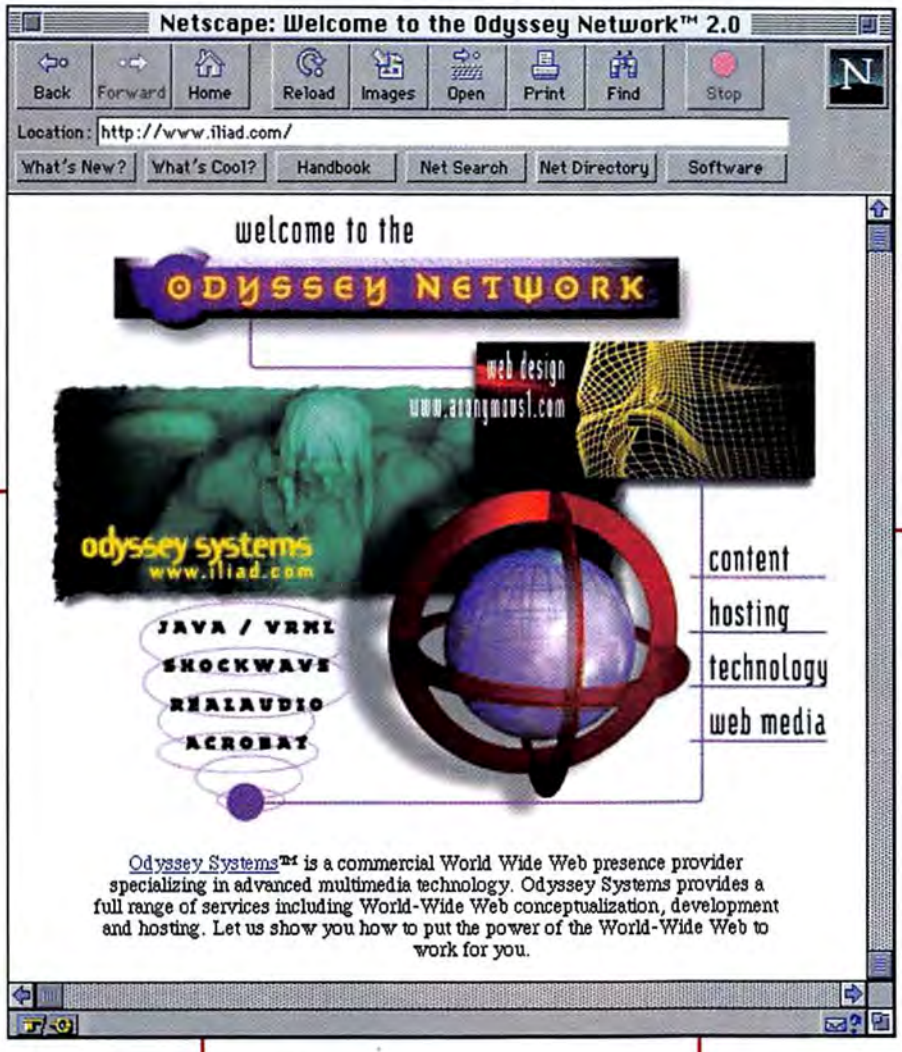
1 To give the Web page the appearance of three dimensions, Peacock created a black-and-white wire-frame mask in Amapi, a 3-D–modeling package by Yonowat, and rasterized it in Photoshop.

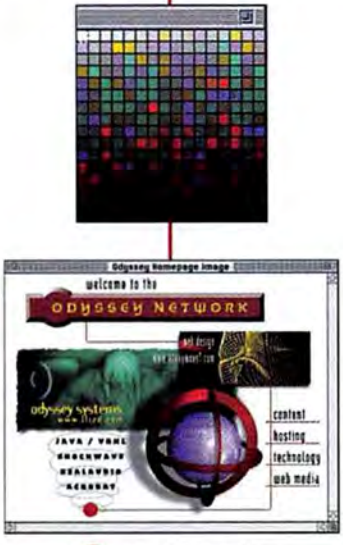


2 To keep the file size down, Peacock colorized the mask in Photoshop using only three colors.

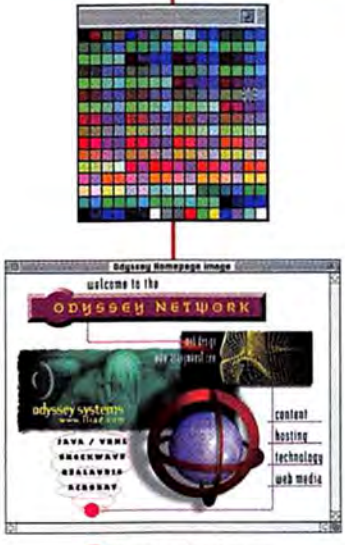
3 Converting the image to 8 bits in DeBabelizer enabled Peacock to further reduce the file size. DeBabelizer also gave him far more control over remapping pixels than Photoshop, so he was able to maintain image quality close to that of the original.



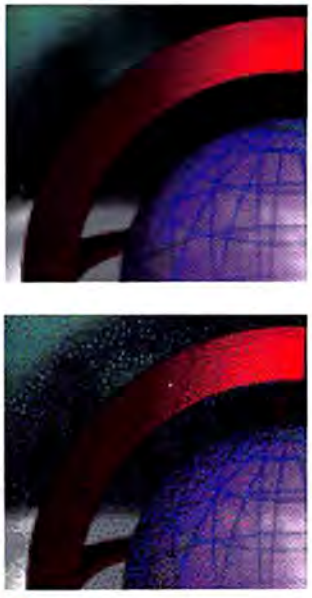




4 Here's how the image looked after Peacock reduced it to 8 bits using the custom color palette he created in DeBabelizer.



5 Here's the image after DeBabelizer converted it to 8 bits using the standard 256-color Windows palette.



6 Because the globe (created in Infini-D) and the Zeus image both contained many subtle color shifts and lighting effects, they were much smoother-looking in JPEG (top) than in GIF.

In GIF format (bottom), the image looks mottled because GIF reduces the color palette much more drastically than does JPEG and interprets subtle color variations crudely—a tradeoff the client chose to make for browser compatibility.

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Buyers' Tools

Tape-Backup Systems

A NEWCOMER TAKES TOP HONORS IN MACWORLD LAB TESTS

by Dan Littman

Several years ago your hard drive crashed so hard it gouged a hole in your desk. That one catastrophe was enough for you—since then you've always stashed away an extra copy of your data. But back then your hard drive held only 80MB, and its contents fit easily on one backup tape. Nowadays your Mac is probably equipped with a 2GB hard drive. The inconvenience of backing up escalates as your collected data expands.

What to do? While there are plenty of removable-media types that make good backup systems, tape has stayed ahead of the pack both in cost per megabyte and in total capacity, while reaching speeds that make it viable for backing up even the biggest drives. Unlike most other removables, though, a tape drive is too slow to double as a regular storage device—it's good only for backup and archiving.

Just as removable-platter and floppy formats have proliferated, so have tape formats. We looked at four basic types of tape drives: all do essentially the same thing, but some are better suited for single users and others for network use, and some are more appropriate for the enormous file sizes of digital video and prepress and others for the more typical business scenario of many small files. To help you pick the right kind of tape system for your needs, Macworld Lab tested and compared 17 tape drives, using seven different mechanisms, chosen from the four tape formats we consider most viable—Travan, DAT, 8mm, and DLT.

KEVIN CANDLAND

The Four Formats

• Quarter-inch cartridge drives, commonly called QIC or "quick," were oblivion-bound until Conner (now Seagate [*http://www.seagate.com*]) developed the new Travan QIC format, which holds 2GB of uncompressed data on a tape. (Note that compressing your data can squeeze up to twice as much onto any tape format. Different kinds of data compress by different amounts; raw text tends to be the most compressible, and complex graphics the least.)

We tested two Travan systems, one marketed under the Seagate label and one from MegaHaus (*http://www.megahaus.com*). Both make irritating, unnerving noises. A specially designed case might reduce noise, but for this format—which, compared with DAT, holds half the capacity, runs at half the speed, and costs between a half and a third as much—it's unlikely any vendor would make the investment.

• DAT (digital audiotape) uses a 4mm cartridge; depending on tape length, DATs range in capacity from 1GB to 4GB, uncompressed. DAT is convenient, inexpensive, and equally effective on the network or on your desk. The first thing to like about DAT is how quiet it is—just a slight whoosh and an occasional click.

But the DAT implementations we looked at have some pitfalls to watch out for. The Microtech (*http://www.microtechint.com*) Blue Stream, for exam-

ple, uses a nonstandard SCSI cable; its case covers up some of the status lights; and its SCSI-number switch is not protected, so you could accidentally change its ID while groping in the back for the on/off switch. The DynaTek (*http://www.dynatek.co.uk*) DAT drive's tape-eject button provides no tactile response—DATs take a moment to eject, and until the tape comes out you can't tell if pressing the button did the trick. Finally, the Hewlett-Packard (*http://www.hp.com*) unit didn't even include Mac software, a substantial extra cost—a copy of Dantz Development's (510/253-3000, *http://www.dantz.com*) Retrospect, which is the Mac tape-drive standard and is included in 15 of the 16 other systems we tested, will run you $125 to $150; the MegaHaus DAT comes with Novastor's Novaback, which we didn't test.

• We looked at two versions of Exabyte's (*http://www.exabyte.com*) 8mm system, one internal and one external. The system holds up to 7GB of uncompressed data and is very quiet. The external device looks like a sophisticated answering machine or portable cassette player, with a door on top that pops open for the tape. Exabyte announced its Mammoth drive last August to compete with DLT-type drives, with twice the speed at the same price and capacity. However, the Mammoth didn't ship until spring this year, after the test deadline for this story. Watch for a review of the Mammoth, which reportedly can accommodate 8mm tapes.

• DLT (digital linear tape) is the new kid on the block. Its ½-inch cartridges can hold up to 20GB of uncompressed data. DLT is most efficient with data that doesn't require a lot of stopping and starting—huge graphics files, or streaming data formats such as digital video. It runs so fast that even a lightly trafficked 100BaseT network can't keep it busy; in fact, feeding data too slowly was reputed to damage early DLT systems (Quantum [*http://www.quantum.com*] claims that the current generation does not have that problem).

The first thing you'll notice about DLT systems is their appearance: they're about as big as a large shoebox and somewhat intimidating to behold. Not to worry: DLT drives are DAT-quiet and as easy to use as any other tape drive. The five DLT systems we looked at are essentially identical—all Quantum mechanisms, with the same faceplate, status lights, and buttons for setting the tape density. One minor disadvantage is that, unlike the other three formats, DLT tapes are not self-contained in cartridges but are more like reel-to-reel systems, so you must rewind a tape completely before you can eject it.

What Price Performance?

After capacity, backup speed is the next important consideration. The Travan QIC is the slowest overall, maxing out at about 23MB per minute when backing up a large collection of small files in a compressed format (see the benchmark, "Tape Drives: Bigger Is Better"). That means the Travan takes about 40 minutes to back up a 1GB drive. (These times were measured with data verification turned on—you should keep verification on as a safeguard that your data is recorded properly.) Generally Exabyte comes next at about 33MB per minute, or a half-hour or so to back up a 1GB drive (although one DAT drive did rank lower). DAT backups range from about 40MB per minute for units that use Hewlett-Packard's C1533A mechanism to about 50MB per minute for units based on Sony's SDT 7000 mechanism. The Quantum DLT-based systems top 70MB per minute, or less than 15 minutes for a 1GB drive.

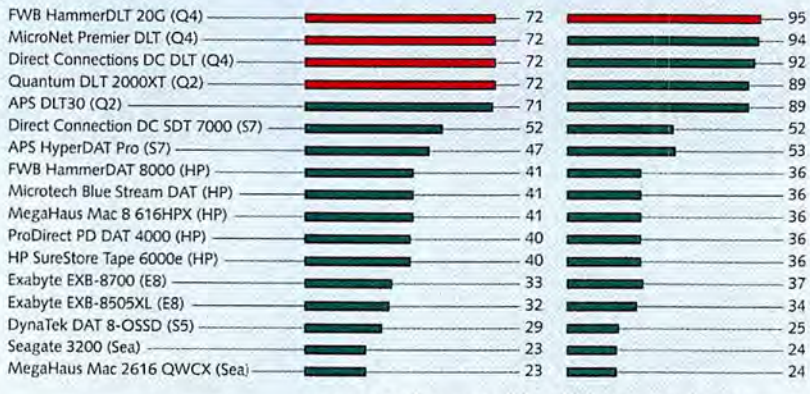
To determine which tape system is best for you, add up the capacity of all the hard drives you need to back up, then add 20 or 30 percent for the vagaries of compression. The total equals the tape capacity you need (whether in single tapes or the aggregate in a tape library). You also need to decide whether you're

Tape Drives: Bigger Is Better

MW LAB

Macworld Lab testing shows a direct relationship between the two critical qualities of a tape backup system: the bigger its capacity, the faster it performs—good news as hard drives grow past the 1GB or 2GB common today. (Uncompressed, Travan tops out at 2GB, DAT at 4GB, Exabyte at 7GB, and DLT at 20GB.) Note that DLT mechanisms, which suffer from a lot of overhead involved in starting and stopping the tape, copy the single big file about 25 percent faster than they do the many small files.

Best result in test. Products in order of overall speed. Results shown in megabytes per minute. Longer bars are better.



Mechanism Key: E8 = Exabyte EXB 8mm; HP = HP C1533A DAT; Q2 = Quantum DLT 2000; Q4 = Quantum DLT 4000; Sea = Seagate CTMS3200 Travan; S5 = Sony SDT 5000 DAT; S7 = Sony SDT 7000 DAT.

Behind Our Tests

We tested tape drives on two different backup scenarios: a typical office worker's or professional's drive filled with many small documents, and a video-editor's drive containing a single huge file (a 400MB QuickTime movie). Both backups were performed with verification on, which is typical and recommended; we then restored each backup and ascertained that there was no corruption. We used Dantz Development's Retrospect 3.0 with 8MB of memory allocated to it on a Power Mac 7500/100 running System 7.5.2 and equipped with 32MB of RAM and a 1GB internal drive.—**Macworld Lab testing supervised by Mark Hurlow**

Tape Drives: Four Key Types

Company	Product	Star Rating*	List Price/ Company's Estimated Price	Phone	Format	Mechanism	Native Capacity (in MB)	Cost of Tape	Warranty (in years)
APS	DLT30	★★★/6.5	$4000/$4000	816/483-6100	DLT	Quantum DLT 2000	15	$45	2
APS	HyperDAT Pro	★★★/5.9	$1100/$1100	816/483-6100	DAT	Sony SDT 7000	4	$25	2
Direct Connections	Editors' Choice DC DLT 4000	★★★★/7.4	$3495/$3495	612/937-9771	DLT	Quantum DLT 4000	20	$100–$110	2
Direct Connections	Editors' Choice DC SDT 7000	★★★/6.6	NP/$999	612/937-9771	DAT	Sony SDT 7000	4	$25	1
DynaTek	DAT 8-OSSD	★★/4.6	$1299/$1099	902/832-3000	DAT	Sony SDT 5000	4	$25	1
Exabyte	EXB-8700	★★/4.9	$2300/$1995	303/442-4333	8mm	EXB-8700	7	$25	2
Exabyte	EXB-8505XL	★★/4.4	$1795/$1595	303/442-4333	8mm	EXB-8505XL	7	$25	2
FWB	HammerDLT 20G	★★★/5.9	$6499/$5999	415/325-4392	DLT	Quantum DLT 4000	20	$100–$110	2
FWB	HammerDAT 8000	★★/4.7	$1539/$1429	415/325-4392	DAT	HP C1533A	4	$25	1
Hewlett-Packard	SureStore Tape 6000e	★★/4.2	$1700/$1300	970/669-8000	DAT	HP C1533A	4	$25	1
MegaHaus	Mac 8 616HPX	★★★/5.5	$1079/$1079	713/534-3919	DAT	HP C1533A	4	$25	1
MegaHaus	Mac 2616 QWCX	★★/4.6	$469/$469	713/534-3919	Travan	Seagate CTMS3200	2	$35	2
MicroNet	Premier DLT	★★★/6.0	$7115/NP	714/453-6000	DLT	Quantum DLT 4000	20	$100–$110	2
Microtech	Blue Stream DAT	★★/4.3	$1599/$1399	203/468-6223	DAT	HP C1533A	4	$25	2
ProDirect	PD DAT 4000	★★/3.4	$1195/$900	612/941-1805	DAT	HP C1533A	4	$25	2
Quantum	Quantum DLT 2000XT	★★★★/7.0	$4200/NP	408/894-4000	DLT	Quantum DLT 2000	20	$100–$110	2
Seagate	3200	★★/4.9	$339/NP	714/252-7800	Travan	Seagate CTMS3200	2	$35–$40	2

*NP = Not provided. *Based on features, implementation, innovation, performance, reliability, ease of use, and value. (See Star Ratings section for full explanation.)*

better off with a system, such as DLT, that is more efficient on streaming data, or one like DAT that works better with numerous small files.

How much will your ideal system cost? The Travan systems are by far the least expensive—less than $500. However, Travan tape is expensive, at about $35 by mail order for a 2GB cassette. DAT systems vary widely in price, from Direct Connections' (*http://www.directdc.com*) $1000 system to FWB's (*http://www.fwb.com*) $1400-plus unit; 4GB DAT cassettes are no bargain at about $25 each. Exabyte's 8mm systems are one-fourth to one-third slower than DAT systems and sell for about $200 more than the FWB DAT. Exabyte's primary advantages over DAT are its 7GB capacity and inexpensive cassettes, which cost only about $25 each. The internal Exabyte sells for $1600, or about $400 less than the external unit; the disadvantage of an internal unit, of course, is that you can't pass it around among your colleagues—that's a lot of money for a single-user system.

The DLT systems we looked at range from a street price of $3500 for Direct Connections' unit to a list price of $7000 for MicroNet's—given those prices and the reality that your network will wipe out a DLT's performance advantage, DLT only makes sense for two specialized uses: on a network with too much data for a DAT or 8mm system to back up, or for local use with digital-video, photo-editing, or other applications that produce huge files. Under those circumstances, DLT has no substitute. However, be forewarned that tapes for DLT systems can be hard to find.

The Last Word

Based on our performance results, we were most pleased with the DAT and DLT technologies. Although the latter tends to be pricey, it can't be beat when it comes to speed across a network, and it's especially good with large files—one of the Mac's specialties as well. To determine our Editors' Choice, then, we've picked the DAT and DLT drives that offer the most for your money. As it turns out, both come from Direct Connections and stand out because of features above and beyond their price and performance. Because 8mm and Travan systems fill no significant gaps in capacity—and because the implementations we tested were not that impressive—we have no Editors' Choice for these formats.

Although tape drives are facing new competition from technologies such as recordable CD drives, our test results show that the tape medium isn't losing any of its strength in the meantime. **m**

DAN LITTMAN has reported on business technology for ten years.

TAPE-BACKUP SYSTEMS

MW EDITORS' CHOICE

A tape-backup system should be capacious, fast, and as inexpensive as that combination permits.

Digital Audiotape

★★★/6.6 Direct Connections SDT 7000 This is the least expensive DAT system we looked at, though it uses the Sony DAT mechanism (which is about 20 percent faster than the HP mechanism) and is housed in a solid metal case. **Company:** Direct Connections (612/937-9771, *http://www.directdc.com*). **Company's estimated price:** $999.

Digital Linear Tape

★★★★/7.4 Direct Connections DLT-4000 Again, Direct Connections wins by beating the competition on price—as little as half what some vendors charge for the same mechanism. The case features an extra power plug and a protected SCSI ID selector. **Company:** Direct Connections. **Company's estimated price:** $3495.

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by Geoff Duncan

Choosing a Mac-Savvy Internet Provider

THE RIGHT CONNECTION MAKES ALL THE DIFFERENCE

BEFORE YOU LOOK FOR an Internet service provider (ISP), you must first decide why you need Internet access and how you plan to use the Internet. There's a world of difference between simply needing E-mail access and centering your business around Internet connectivity.

What Do You Need? First, write down what you want to do on the Internet now, then what you might want to do in six months. (On the Internet, so much can change in six months that projecting further is basically futile.) Do you want your own home page on the Web? If so, do you want an extensive Web site that handles transactions or offers searching or forms? Do you want to participate in real-time chats (IRC) or browse Usenet? Do you need more than one E-mail account (one for you and one for a family member)? How often do you plan to be online, and for how long?

Making a List Next, make a list of possible providers. If you're already online, consult one of the listings to find a provider in your area. There are also nationwide Internet providers (such as UUNET, PSI, Netcom, and Earthlink) that are widely accessible in the United States. If all else fails, look in your local telephone directory under "Internet," "Networking," or (worst case) "Computers," or on the Web at *http://www.celestin.com/pocia/* and *http://www.thelist.com/*.

Once you have a list of providers, it's time to get information about them. If you're already online and a provider has a Web site, you might be able to get most of this information without having to pick up the phone.

Does It Know the Mac? First and foremost, determine whether the ISP understands and supports the Macintosh. There are a few Mac-only ISPs, but most serve a variety of platforms and some aren't familiar with the Mac. Ask if the provider supports the Mac, then ask if it supports MacTCP and Open Transport. If the provider doesn't explicitly offer support for the Mac or doesn't understand what you're asking, take your business elsewhere.

Ask whether the provider has support personnel who specialize in the Mac. A good provider will have at least one person on its tech-support staff who handles Macintosh issues. The more Mac-savvy support personnel it has, the better. Also ask what portion of its customer base uses Macs; it probably can't give an exact answer, but it's encouraging if the provider has a good idea.

Software and Documentation The basic software for connecting to the Internet (MacTCP or Open Transport) comes with System 7.5.X, but you'll probably also need SLIP or (more likely) PPP software to dial your modem and manage your connection. If the ISP provides software, it will probably be a collection of shareware or freeware—that's fine, since much of the best Mac Internet software falls into this category. If you've purchased software (such as the Apple Internet Connection Kit), ask if the provider supports your software.

At the very least, the provider should give you a written description of the MacTCP and Open Transport settings necessary to connect your Mac to its system, along with the names of the machines to use as your mail server, news (Usenet) server, and name server. If you'll be accessing the provider via a modem, the provider will also have to provide phone numbers and settings for using PPP or SLIP. This information is different for every provider.

It's unlikely that an ISP will provide documentation covering the breadth and depth of the Internet. You may want to consider a book that goes into some detail. Two favorites are *The Internet and the World Wide Web*, by Angus Kennedy and Adam Engst (Rough Guides, 1995), and Adam Engst's *Internet Starter Kit for Macintosh* (Hayden Books, 1995).

Quality Tech Support If you can't reach your provider's tech-support people, it doesn't matter how well they know the Macintosh. In case you can't reach them, you should find out if you can leave voice mail or E-mail, and how quickly they respond. Good tech support will get back to you by phone or E-mail within 24 hours. Also, some ISPs have an automated status line—obviously, good providers keep their message updated and accurate.

Many ISPs also offer support via E-mail, a series of FAQs, or local Usenet newsgroups. I'm a big fan of providers that maintain local newsgroups: not only do you see how the provider responds to questions, but you learn how others are using the Internet.

Busies Many providers experience

continues

JENNIFER JESSEE

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Bugs and Turkeys

AppleShare 4.2.1 server software, the most recent, fully native version and the only version compatible with the PCI Bus, according to Apple, is not currently available through retailers but only comes bundled with Workgroup Servers. Sources at Apple say owners of desktop PCI machines can upgrade from 4.0.2, but online Read Me files say Apple doesn't support use of earlier versions of AppleShare on desktop PCI models. Apple Computer, 408/996-1010, *http://www.apple.com*.

The *Macworld* "Group Hug" Turkey goes to the growing ranks of software publishers who feel that it's perfectly OK to release beta software—excuse us, *preview* software—and let users find and report the bugs. As one cyber-CEO has said, "It's a great way to get 5 million beta testers gratis." During the past year, Netscape and America Online have mooched off the indentured masses, and rumor has it Apple will release a working beta of its Copland operating system before releasing the final version.

Claris FileMaker Pro 3.0 currently runs only on Windows 95 systems. Since 3.0-converted files are not backward-compatible, this presents a problem for users who share files between Macintoshes and Windows 3.1 machines. Claris estimates that a Windows 3.1–compatible version of FileMaker 3.0 will be available sometime in June. Claris, 408/987-7000, *http://www.claris.com*.

Macworld will send you a Bug Report or Turkey Shoot T-shirt if you are the first to inform us of a turkey or a serious, reproducible bug that we report in this column. See How to Contact Macworld.

peak usage in the evening, when users get home from work and check their E-mail. Ask the provider how it handles busies and whether they're a recurring problem. The provider will probably paint a rosy picture, so ask for its main modem number and then call it in the evening (between 7 and 10 p.m.) to see if you get a busy signal. (If you hear modem tones, just hang up.) Also call at a time you think will be typical for your use. If you don't get through on the first call, try a second and third time. If you don't get through on the third call, ask the provider what it's doing to address the problem.

Regional or National? If you travel frequently and will need to access the Internet while on the road, consider a nationwide provider. Pricing plans for these providers vary greatly; in some cases the cost of a few long-distance calls to a regional provider may be less expensive.

Smaller regional providers might seem like fly-by-night operations (and some are), but many are well established and quicker to add services and correct problems (particularly phone or modem troubles) than nationwide providers. When considering regional providers, look for one that's been in business at least a few years.

Pricing Rates for dial-up Internet access are currently about $10 to $30 a month. With Internet providers you get what you pay for, and the least expensive often provide the least value. You can probably find "unlimited" PPP access dirt cheap, but will you get anything but a

Streetwise Shopper

Colorize 2.0 DS Design is offering a $149 competitive upgrade to Colorize 2.0 (Dec 95 ★★★) from any other image-editing application; regular retail price is $495. DS Design, 919/319-1770, *http://www.dsdesign.com*.

Informed Filler for Newton Shana offers the mobile-computing component of its line of electronic forms software, plus Informed Manager, for $149. Shana, 403/433-3690, *http://www.shana.com*.

Multimedia Dogs Inroads Interactive is offering this CD-ROM for $10 plus shipping ($5 domestic, $10 international) while supplies last. Mention the Idealist mail list. Inroads, 303/444-0632, *http://www.inroadsint.com*.

WordPerfect 3.5 Corel is offering a free update to WordPerfect 3.5 (Jun 96 ★★★★/7.4) owners. The update includes bug-fixes; enhancements to the HTML export filter—you can now export graphics as well as text—and to the HTML macros; 150 Bitstream fonts; and 1000 clip-art images. Corel, 800/451-5151, *http://www.corel.com*.

busy signal when you call? Is the system unavailable for days at a time? Inexpensive providers are not all bad, but it's best to be wary.

Some pricing plans are "flat rate" (the fee is the same no matter how much or how little time you use), some use hourly schedules (the fee varies based on how long you're connected), and some are a mixture of the two (a monthly rate covers the first ten hours; additional hours are billed on a per-hour basis). If you don't plan to spend a lot of time online each month (say, less than 10 or 15 hours), an hourly plan may be a better option. Otherwise, look for a flat-rate plan.

Many providers discount their pricing significantly if you're willing to pay for 3, 6, or 12 months at a time. Also, some providers have special rates for particular Internet books or software packages: be sure to ask about discount pricing and special deals.

Special Considerations and the Future

Many ISPs provide more than mere connectivity. If you want to have your own Web page, ask if the ISP has a Web server its customers can use; if so, ask if there's a limit to how much material you can make available.

If you need more than one E-mail address, ask how that would be handled. Some providers might give you additional addresses for free, some might charge you for additional accounts, and others will be somewhere in-between. America Online handles this nicely, since each account can have up to five screen names. If you require multiple E-mail addresses and don't need direct Internet access, AOL might be worth considering.

Ask about time limits—some providers don't limit the length of online sessions, but some enforce a three-hour session limit, a "two hours on, two hours off" policy, or something similar. Ask for the provider's session-limit policy.

Finally, you should pick a provider that not only meets your immediate needs, but is also *currently* capable of meeting your needs six months from now (why do you think I made you list those needs?). Sure, you could always move to a different provider at a later date, but why do something twice when you can do it right the first time? Also, the more you depend on your Internet connectivity, the more trouble it is to change your E-mail address and other online contact information.

THE AMCOEX INDEX OF USED MACINTOSH PRICES

Machine (RAM/Hard Drive)	Average Sale Price	Monthly Change
PowerBook 140 (4MB/40MB)	$550	–$25
PowerBook 165 (4MB/80MB)	$775	–$50
PowerBook 180 (4MB/80MB)	$925	–$100
PowerBook Duo 230 (4MB/80MB)	$700	–$25
Mac IIsi (5MB/40MB)	$250	+$25
Mac IIci (4MB/80MB)	$350	–$100
Mac IIfx (4MB/80MB)	$375	–$25
Centris 650 (8MB/230MB)	$750	–$25
Quadra 800 (8MB/230MB)	$1100	–$25
Quadra 900 (8MB/160MB)	$950	+$25
Power Mac 7100/80 (8MB/350MB)	$1275	–$25
Power Mac 8100AV (8MB/500MB)	$2125	+$25

Index provided by the American Computer Exchange of Atlanta (800/786-0717). It reflects sales during the week of May 20, 1996. Configurations include keyboard and exclude monitor and display board for noncompact models.

GEOFF DUNCAN is the managing editor of TidBITS (*http://www.tidbits.com/*), the online Macintosh weekly, and also works as a freelance Macintosh and Internet consultant. You can E-mail him at *gaduncan@halcyon.com*.

Letters

Is This the Real WriteNow? I've seen postings on America Online that the word processor WriteNow had been discontinued. I'm puzzled because I recently received a sales brochure from Softkey International offering WriteNow 4.0. Is the product in the brochure an entirely different product, or is this a reissue of the discontinued product by another company?

DARLENE O'CONNELL
Sioux Falls, South Dakota

WriteNow, originally sold by T/Maker, ended up as a Softkey International product after a series of mergers. The current version, 4.0.2, has a street price of about $59. See "Lean Writers," Macworld, March 1995, for details on this speedy word processor.—SUZANNE COURTEAU

Not getting the treatment you deserve? Or have you received heroic service? Write to the *Consumer Advocate* at *Macworld*, 501 Second St., San Francisco, CA 94107, or send us a fax at 415/442-0766. m

Macworld DIRECTORY

Hot new directory

Don't miss **Macworld Directory**, the **hottest** new section to hit *Macworld*.

Macworld Directory is your one-stop buying resource, putting you in touch with the products and services you're looking for.

You'll find Macworld Directory after the Macworld Shopper section.

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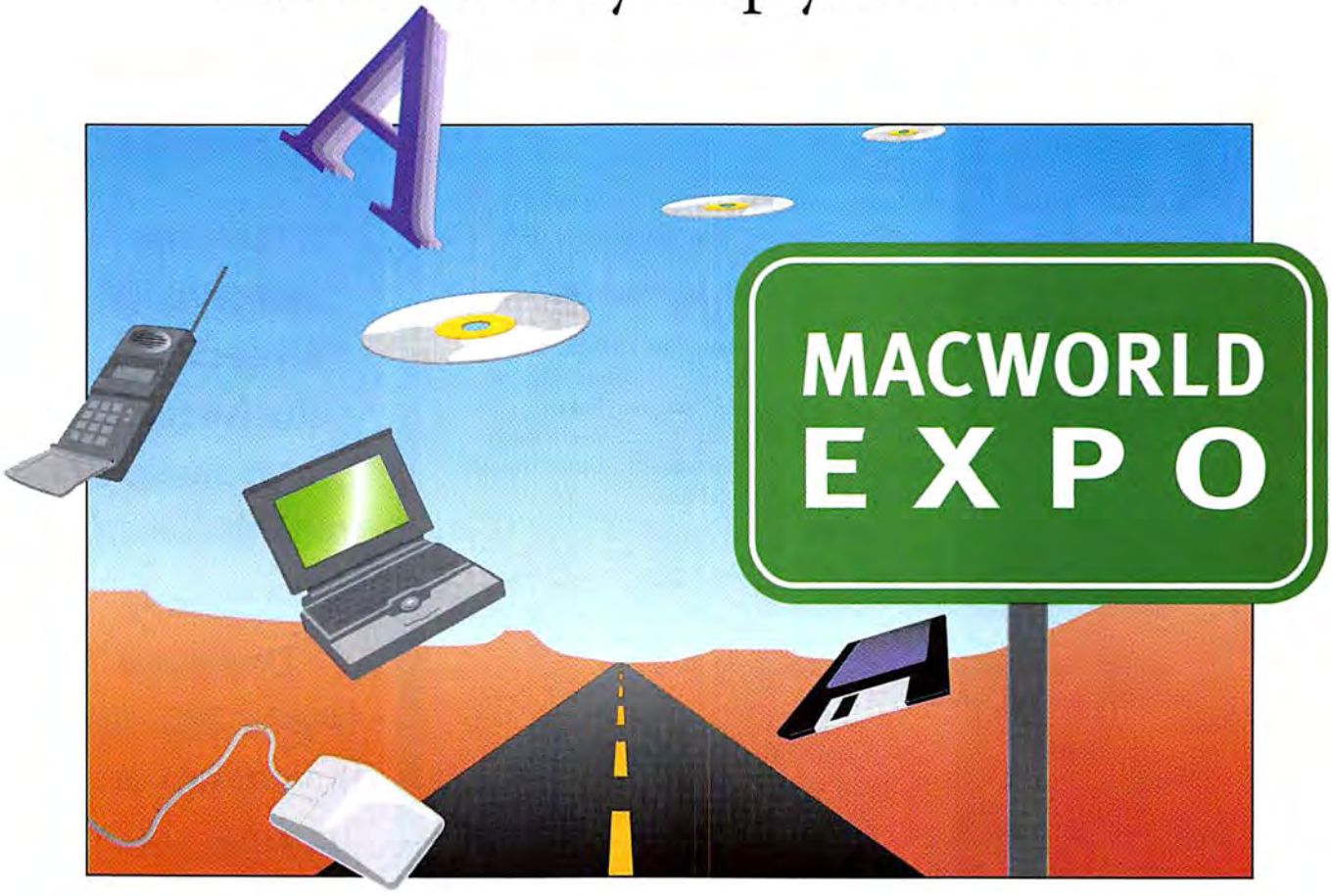

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MACWORLD Expo is your chance to see hundreds of companies presenting the latest in turbo-charged Macintosh technology. Make side by side comparisons of thousands of Macintosh products. Learn from the experts how to fine-tune your system and what products will keep your engine running smooth. Attend a variety of information-packed conference programs that provide the skills and knowledge to put you in the driver's seat. So pull on in and take that new Mac for a spin.

Add a stop at any of our upcoming MACWORLD Expo events to your information roadmap. With shows in **San Francisco** and **Boston,** we're just around the next bend.

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Star Ratings

HARDWARE AND SOFTWARE PRODUCTS AT A GLANCE

Macworld Star Ratings lets you compare Macintosh products based on the authoritative assessments in our reviews and features. The number of stars indicates the product's level of quality; each product also gets a numeric score that provides a more exact assessment of the product's quality within that level. We evaluate seven factors to derive the Star Rating: feature set, design implementation, performance, reliability, ease of use, innovation, and value. We take these evaluations, weight their importance for each class of product, and calculate the final score. The higher the score, the better a product is, even among products with the same number of stars. The following list shows how the ratings and scores relate.

★★★★★	9.0 to 10.0	Outstanding
★★★★	7.0 to 8.9	Very Good
★★★	5.0 to 6.9	Good
★★	3.0 to 4.9	Flawed
★	0.0 to 2.9	Unacceptable

This section also lists products that have been awarded an **Editors' Choice** designation in a *Macworld* product comparison.

If a product has been upgraded since our last assessment, the most recent version number appears in parentheses after the main reviewed version number. To read a full review of any product in the listing, please consult the issue indicated at the end of the listing or search for the product via Macworld Online (keyword *Macworld* on America Online; URL *http://www.macworld.com* on the World Wide Web).

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

software

BUSINESS TOOLS

★★★★/8.8 **4th Dimension 3.5,** ACI US, 408/252-4444, $895. Leading Mac database gets important improvements. *Mar 96, p. 60*

★★ **Adobe Acrobat 2.0 (2.1),** Adobe Systems, 415/961-4400, $195. The font fidelity of this portable-document software is uneven. *Mar 95, p. 59*

★★★ **Adobe Acrobat for Workgroups 2.0 (2.1),** Adobe Systems, 415/961-4400, $1595. Portable-document software for workgroups is inexpensive but resource-intensive. *Mar 95, p. 59*

★★★★ **ArcView 2.1,** Environmental Systems Research Institute, 909/793-2853, ext. 2050, $995. Sophisticated GIS program is easy to customize. *Jan 96, p. 55*

★★★★/8.4 **ClarisWorks 4.0,** Claris, 408/727-8227, $129 (estimated). The program's speed, clean design, and low resource requirements put the big boys to shame. *Jun 96, p. 98*

★★★★★/9.7 **Data Desk 5.0,** Data Description, 607/257-1000, $625. Classic statistics program adds dazzling new features. *Mar 96, p. 79*

★★★★★ **DeltaGraph Pro 3.5,** DeltaPoint, 408/648-4000, $195. Easy-to-use graphing software stands out from the pack. *Jan 96, p. 57*

★★★★/8.2 **FileMaker Pro 3.0,** Claris, 408/727-8227, $199 (estimated). FileMaker 3 is now relational, Power Mac native, and more useful than ever. *Jun 96, p. 98*

★★★/6.1 **Mac Manager 3.1,** ELS, 352/375-0558, $79. Desktop security takes on a Copland-style look, complete with a few ragged edges. *May 96, p. 78*

★★/4.4 **MapLinx 3.0,** MapLinx, 214/231-1400, $149.95. Useful tool if you only need to see where your customers are located. *Apr 96, p. 82*

★★/4.6 **McAfee VirusScan,** McAfee Associates, 408/988-3832, $65. Virus-detection package falls short on features compared with other commercial competitors. *May 96, p. 74*

★★★ **Meeting Maker XP 3.1,** On Technology, 617/374-1400, $249; $890 for 10 users. Group scheduling program is useful for small and midsize businesses. *Jan 96, p. 69*

★★★★/7.1 **Microsoft Excel 5.0,** Microsoft, 206/882-8080, $295 (estimated). Although it's the only game in town for number-crunching professionals, Excel 5 is a glutton for RAM and disk space. *Jun 96, p. 98*

★★★★ **Microsoft FoxPro for Macintosh 2.5 (2.6),** Microsoft, 206/882-8080, $495. The relational database offers fast searching but an uneven interface for users. *Apr 94, p. 56*

★★★★/7.1 **Panorama 3.0,** ProVue, 714/841-7779, $290 (estimated). This database program features easy, flexible forms, hypertext links, and fast network abilities. *Jun 96, p. 98*

★★★★/7.1 **PhonePro 3.0,** Cypress Research, 408/752-2700, $349. Telephony standard improves programming, sound handling. *Jul 96, p. 72*

COMMUNICATIONS/NETWORKS

★★★/6.5 **BBEdit 3.52,** Bare Bones Software, 508/651-3561, $119. This Web-authoring tool targets power users. *Jun 96, p. 61*

★★★/6.9 **Claris Emailer 1.0v2,** Claris, 408/987-7000, $89. One-stop E-mail sending, receiving, and storing, plus a single all-encompassing address book. *Apr 96, p. 102*

★★★★/8.0 **CommuniGate 1.0,** Stalker Software, 415/383-7164, free for 5 users; 25 users $200; unlimited users $600; gateway modules $100 each. CommuniGate lets you send mail, faxes, print jobs, and electronic pages. *Apr 96, p. 63*

★★/4.6 **COPSTalk for Windows 1.2f,** CoOperative Printing Solutions, 770/840-0810, $179 per user. Windows 95–compatible software gives PCs AppleTalk capability. *Mar 96, p. 67*

★★★/5.8 **CU-SeeMe 1.0,** White Pine Software, 603/886-9050, freeware. Great for avoiding long-distance phone charges, but Internet is poor vehicle for video transmission. *May 96, p. 82*

★★/4.9 **CyberFinder 2.0,** Aladdin Systems, 408/761-6200, $30. Software uses the Finder to track Internet URLs. *Mar 96, p. 82*

★★★★/7.4 **DragNet 1.03,** OnBase Technology, 714/830-5682, $39.95. DragNet helps you sort and categorize Internet addresses. *May 96, p. 52*

★/1.4 **httpd4Mac 13b,** Bill Melotti, free. Minimalist freeware: feature-poor and unreliable Mac Web server. *Apr 96, p. 86*

★★★/5.2 **InterServer Publisher 1.0.1,** Intercon, 703/709-5500, $795. Fast and functional, but missing key features and documentation. *Apr 96, p. 86*

★★/3.1 **LANScape SNMP 2.1,** Sonic Systems, 408/736-1900, $799. SNMP console sports some sophisticated features, but its interface, basic features, and documention need work. *Jul 96, p. 74*

★★★/6.4 **LANsurveyor 3.0,** Neon Software, 510/283-9771, 5 zones, $395; unlimited zones, $695. LANsurveyor maps and monitors your AppleTalk network. *May 96, p. 70*

★★★★ **MacAdministrator,** Hi Resolution, 508/463-6956, $395 (10-user pack). Group administration tool is a great helper for network administrators. *Dec 95, p. 75*

★★★/6.3 **MachTen 4.0,** Tenon, 805/963-6983, $695. Fast but hard to use, requiring Unix administration skills. *Apr 96, p. 86*

★★/4.0 **MacHTTP 2.2,** Quarterdeck/StarNine, 510/649-4949, $95. Capable Mac Web server shareware but unreliable under heavy load. *Apr 96, p. 86*

★★★/5.0 **MailKeeper 1.0.2,** Nisus Software, 619/481-1477, $35. Quick online information database could be more convenient. *Apr 96, p. 70*

★★★★/7.4 **Navigator 2.0,** Netscape Communications, 415/528-2555, $49 without manual, $69 with manual. Netscape pushed beyond Web browsing. *May 96, p. 50*

★★★★/7.3 **NetMeter 1.0,** AG Group, 510/937-7900, $395. Keep tabs on your Ethernet network via sights and sounds. *Jun 96, p. 73*

★★★★/7.8 **NetPresenz 4.0,** Stairways Shareware, no

continues

Star Ratings

phone, $10 (shareware). Internet server on a shoestring. *May 96, p. 55*

★★★/6.9 **PageMill 1.0,** Adobe Systems, 415/961-4400, $149. Drag-and-drop Web publishing software masks HTML complexities. *Mar 96, p. 56*

★★★★/8.8 **PageNow 1.5,** Mark/Space Softworks, 408/293-7299, $119. Alphanumeric paging software gets the message across. *Mar 96, p. 70*

★★★/5.8 **Personal MacLAN Connect 5.51,** Miramar Systems, 805/966-2432, $199 per user. Windows 95–compatible software lets PC and Mac users communicate via AppleTalk. *Mar 96, p. 67*

★★★ **QuickMail 3.0 (3.5),** CE Software, 515/221-1801, $199 to $3799. Good choice for most people, though rule-based features are incomplete. *Jan 95, p. 59*

★★★/6.5 **SiteMill 1.0.2,** Adobe Systems, 415/961-4400, $595. Simple Web-site manager is welcome but incomplete. *Jul 96, p. 67*

★★★ **SnapMail 2,** Casady & Greene, 408/484-9228, $250 (5 users); $420 (10 users); $1940 (50 users). E-mail software is easy to install, but its gateway interface is kludgy. *Dec 95, p. 75*

★★★★/7.3 **StreamWorks 1.0,** Xing Technology, 805/473-0145, free. Netscape plug-in delivers CD-quality audio; no Mac server available. *Jul 96, p. 92*

★★★★/7.2 **Talker 2.0,** MVP Solutions, *http://www.mvpsolutions.com,* free. Netscape plug-in uses no more bandwidth than text does, but won't shut up until you go to another Web page. *Jul 96, p. 92*

★★★/5.5 **Timbuktu Pro for Networks 2.0,** Farallon, 510/814-5000, single user $139; 2-user pack $189; 100-user pack $3999. Remote control and file-sharing standby gets a ho-hum upgrade. *May 96, p. 68*

★★★★/7.3 **Voyager 1.0,** Virtus, 919/467-9700, free. VRML browser lets you view 3-D Web sites, but navigation tools are nonintuitive. *Jul 96, p. 92*

★★★★/7.3 **WebStar 1.2.1,** Quarterdeck/StarNine, 510/649-4949, $795. Reliable, easy to use, and reasonably fast Mac Web server. *Apr 96, p. 86.* Editors' Choice for best Web server software.

DESKTOP PUBLISHING

★★★★ **Adobe PageMaker 6.0,** Adobe Systems, 206/622-5500, $895. Page-layout program's upgrade includes practical and powerful improvements. *Nov 95, p. 60*

★★★★/7.2 **FontMonger 1.5.7,** Ares Software, 415/578-9090, $149.95. Easy font modifications, from redrawing characters to converting font formats. *Apr 96, p. 102*

★★★★ **FrameMaker 5.0,** Adobe Systems, 408/975-6000, $895. Page-layout program is a good choice for technical-document creation. *Nov 95, p. 63*

★ **HoTMetal Pro 2.0,** SoftQuad, 416/239-4801. $195. Web authoring software is hampered by a poorly designed interface. *Jan 96, p. 65*

★★★★/7.0 **PageTools 2.0,** Extensis, 503/274-2020, $99.95. Plug-ins add power and precision to PageMaker. *May 96, p. 65*

★★★★ **QuarkXPress 3.2 (3.31),** Quark, 303/894-8888, $895 ($995 for Power Macintosh). A must-have layout tool for color publishers. *Nov 93, p. 51*

★★★★/7.4 **theTypeBook 4.02b,** Rascal Software, 805/255-6823, $49.95. Creates font reference books from ready-to-print specimen pages. *Apr 96, p. 102*

★★★/5.1 **Xdream 1.0,** Vision's Edge, 904/386-4573, $149. Single Quark XTension comprises 24 tools ranging from useful to indispensable. *Jun 96, p. 50*

★★★★/7.1 **XPert Tools 1.0,** XChange, 970/229-0620, $99 per volume, $169 for both. If you need to go beyond Quark's feature set, XPert Tools will take you there. *Jun 96, p. 50*

EDUCATION/ENTERTAINMENT

★★★★/8.1 **Alien Tales,** Brøderbund, 415/382-4700, $45. Brøderbund enlivens classic literature for kids. *Jun 96, p. 56*

★★★/6.8 **The Amazing Writing Machine,** Brøderbund, 415/382-4700, $45 CD, $35 floppy. Creative writing with a spin. *Jun 96, p. 56*

★★★ **AmoebArena 1.0,** Casady & Greene, 408/484-9228, $49.95. Engaging strategy game pits amoeboid against amoeboid. *Jan 96, p. 75*

★★★★/8.6 **The Cartoon Guide to Physics,** HarperCollins Interactive, 212/207-7000, $49.95. Entertaining introduction to basic kinematics. *Apr 96, p. 78*

★★★/6.2 **Cliffs StudyWare for Algebra 1.0,** Cliffs Notes, 402/423-5050, $49.95. Algebra tutorial makes poor use of multimedia. *Jul 96, p. 76*

★★★★/8.5 **Descent 1.0,** MacPlay, 714/553-3530, $49.95. Which way is up? 360-degree 3-D maneuverability will leave you spinning. *Apr 96, p. 72*

★★★★ **Full Throttle,** LucasArts, 415/472-3400, $49.95. Biker adventure game is witty and action-packed. *Jan 96, p. 73*

★★★/6.9 **Fun With Electronics,** Philips Media, 310/444-6500, $44.99. Multimedia updates a hobby-shop classic. *May 96, p. 80*

★★ **Haight-Ashbury in the Sixties,** Compton's NewMedia, 619/939-2500, $49.95. If you can remember the sixties, you probably don't need this CD-ROM. *Dec 95, p. 84*

★★★★/8.8 **In the 1st Degree,** Brøderbund, 415/382-4700, $49.95. Realistic, interactive legal thriller. *Apr 96, p. 80*

★★★ **King's Quest VII: The Princeless Bride,** Sierra Online, 206/649-9800, $59.95. Adventure game is entertaining, but adults might find its plot silly. *Jan 96, p. 75*

★★★/5.6 **Learn to Speak Spanish 6.0,** The Learning Company, 510/792-2101, $109. Comprehensive, but doesn't adapt to your needs. *May 96, p. 60*

★★★ **The Legend of Kyrandia, Book 3,** Virgin Interactive Entertainment, 714/833-1999, $34.95. Enjoyable adventure game features good graphics and sound. *Jan 96, p. 77*

★★★/5.8 **Life's Greatest Mysteries,** A.D.A.M. Software, 770/980-0888, $39.95. CD-ROM explains imponderables for the medically curious. *Jun 96, p. 75*

★★★★ **Links Pro CD,** Access Software, 801/359-2900, $69.95. An excellent simulation of golf's many challenges. *Jan 96, p. 73*

★★★★/8.5 **Logical Journey of the Zoombinis 1.0,** Brøderbund, 415/382-4400, $40. A different kind of math program, helping kids develop logical thinking skills without manipulating any numbers. *Jul 96, p. 78*

★★★★/8.5 **Marathon 2: Durandal,** Bungie Software Products, 312/563-6200, $79. A well-crafted action-adventure game, but it's not for the squeamish or those disturbed by violence. *Mar 96, p. 85*

★/2.8 **Meet MediaBand 1.0,** Canter Technology, 415/387-0400, $49.95. A poorly executed collection of artwork and music masquerading as a game. *Jul 96, p. 64*

★★★ **Out of the Sun,** Domark software, 415/513-8929, $44.95. Flight-simulation game presents historic and custom battle scenarios. *Jan 96, p. 77*

★★★★★ **Passage to Vietnam,** Against All Odds Productions/Interval, 800/558-3388, dept. 100, $39.95 to $59.95. Stunning photojournalism CD-ROM sets the standard for multimedia projects. *Dec 95, p. 83*

★★/3.9 **Rebel Assault II,** LucasArts Entertainment, 415/472-3400, $54.95. *Star Wars*–inspired game handicapped by minimal game play. *Jun 96, p. 63*

★★★★/7.5 **RedShift 2,** Maris Multimedia, 415/492-2819, $54.95. RedShift 2 lets you explore space from any planet. *May 96, p. 71*

★★★/6.2 **Spanish Native Guide 1.0,** Native Guide Software, 415/802-8085, $49.95. Adapts to your progress, but pronunciation help is missing. *May 96, p. 60*

★★★/5.3 **Spanish Now 4.0,** Transparent Language, 603/465-2230, $129. Engaging approach, but poor documentation and confusing interface. *May 96, p. 60*

★★★/5.3 **Total Distortion 1.0,** Pop Rocket, 415/242-2158, $39.95. A labored mix of interactivity and music videos. *Jul 96, p. 64*

★★★★/8.3 **X-Wing Collector's CD-ROM,** LucasArts Entertainment, 415/472-3400, $59.95. The learning curve is steep, but X-Wing delivers action-packed adventure. *Jun 96, p. 63*

★★★★/8.9 **You Don't Know Jack,** Berkeley Systems, 510/540-5535, $30. "Jeopardy!" with a bad attitude. *Mar 96, p. 85*

FINANCE/ACCOUNTING

★★★★/7.1 **Kiplinger TaxCut 95 1995,** Block Financial Software, 816/751-6000, $39.95; state modules $24.95. Tax-prep program has an easy-to-use interface and elegant organization but lacks a state version. *Apr 96, p. 66*

★★★★ **M.Y.O.B. 5.0,** BestWare, 201/586-2200, $139; $239 with payroll. Well-designed interface makes double-entry accounting easy. *May 95, p. 63*

★★★★/8.6 **MacInTax Deluxe 1995,** Intuit, 520/295-3110, $49.95; state modules $25. Not only guides you effortlessly through your return, but also gives helpful financial-planning advice. *Apr 96, p. 66*

★★★/5.2 **Personal Tax Edge 1995,** Parsons Technology, 319/395-9626, $19; state modules $19. Produces high-quality printed forms but has DOS-inspired interface. *Apr 96, p. 66*

★★★★/7.7 **QuickBooks Pro 4.0,** Intuit, 415/944-6000, $189. Can be customized for your business; Business Library and some Windows features not included. *Jun 96, p. 55*

★★★★/8.3 **Quicken Deluxe 6,** Intuit, 520/295-3220, $59.99. The best-selling package gets bigger and mostly better. *Feb 96, p. 65*

★★/4.9 **WealthBuilder 4.01,** Reality Online, 610/277-7600, $49.95. This financial planner doesn't quite add up. *May 96, p. 74*

GRAPHICS

★★/4.9 **3D World 1.0,** Microspot USA, 408/253-2000, $139. Affordable but limited QuickDraw 3D design tool. *Jul 96, p. 74*

★★★★/8.4 **Adobe After Effects 3.0,** Adobe Systems, 415/961-4400, $995 base version; $1995 Production Bundle. Must-have video-design package enhances motion control and adds effects. *Mar 96, p. 54*

★★★★/7.1 **Adobe Illustrator 6.0,** Adobe Systems, 415/961-4400, $595. Don't let the version number fool you: this is a minor upgrade. Its minor tweaks

continues

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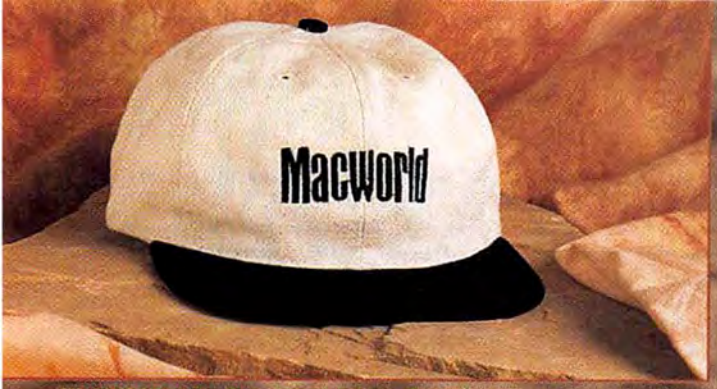

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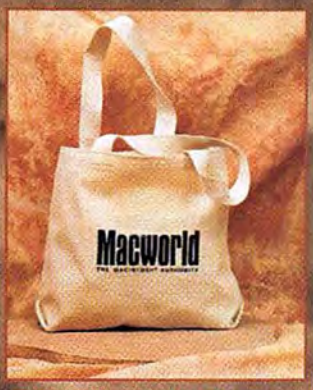

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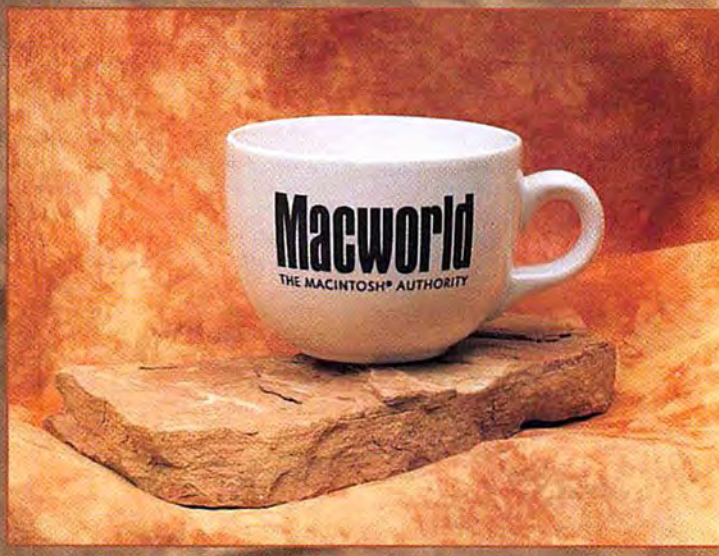

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Star Ratings

aren't enough to surpass FreeHand 5.5. *Apr 96, p. 54*

★★★/6.3 **Adobe PhotoDeluxe 1.0,** Adobe Systems, 415/961-4400, $129. "Photoshop Lite" makes questionable compromises in order to appeal to consumer market. *Apr 96, p. 59*

★★★★/8.5 **Adobe Photoshop 3.0.5,** Adobe Systems, 415/961-4400, $895. Remains the single most significant and capable image editor, but its imperfections and omissions leave some artists searching for alternatives. *Jun 96, p. 78*

★★★★/7.4 **Adobe Premiere 4.2,** Adobe Systems, 415/961-4400, $795. Video editor offers significant enhancements, including CD-ROM Movie Maker plug-in. *Mar 96, p. 90*

★★★ **Canvas 3.5 (3.5.2),** Deneba Software, 305/596-5644, $399. Lots of features but confusing interface. *Jan 94, p. 49*

★★★/6.9 **Boris Effects 1.01,** Artel Software, 617/566-0870, Premiere version $350; Media 100 version $695. Plug-in for Premiere and Media 100 adds video-effects control. *Feb 96, p. 85*

★/1.5 **Chagall 2.0.2,** Technosystems USA, 502/351-0108, $299. Image-editing application flunks test. *Feb 96, p. 78*

★★★★/8.0 **Claris Impact 2.0,** Claris, 408/987-7000, $99. Easy and affordable business-graphics software. *Feb 96, p. 66*

★★★ **Colorize 2.0,** DS Design, 919/319-1770, $495. Colorizing software is effective, but expensive for a one-trick pony. *Dec 95, p. 81*

★★★★/7.5 **Dabbler 2,** Fractal Design, 408/688-5300, $69. Drawing package offers an easy, affordable natural painting option. *Mar 96, p. 63*

★★★★/7.3 **DrawTools 1.0,** Extensis, 503/274-2020, $149. Extensions add color, shape, and object tools to FreeHand and Illustrator. *Feb 96, p. 71*

★★/4.5 **Envelopes 1.0,** Letraset USA, 800/343-8973, $99. Distorts objects but inserts extraneous anchor points as well. *Mar 96, p. 106*

★★★★/7.7 **Extreme 3D 1.0,** Macromedia, 415/252-2000, $699. A good choice for anyone looking for precise modeling controls—as long as they can live without inverse kinematics, special-effects plug-ins, and QuickDraw 3D support. *Jul 96, p. 60*

★★★★ **Infini-D 3.0,** Specular International, 413/253-3100, $899. 3-D software does professional-quality rendering and animation. *Jan 96, p. 54*

★★/3.3 **Infinite FX 1.0,** Beinfinite, 404/552-6624, $149. Many automated reshaping effects, mired by poor organization. *Mar 96, p. 106*

★★★★/8.3 **Kai's Power Tools 3.0,** MetaTools, 805/566-6200, $199. More-powerful plug-ins, more-baffling interface. *Feb 96, p. 57*

★★★★/8.9 **KPT Final Effects 3.0,** MetaTools, 805/566-6200, $695. Superb effects library for Adobe After Effects. *Apr 96, p. 69*

★★★★/8.5 **KPT Vector Effects 1.0,** MetaTools, 805/566-6200, $199. Combines excellent experimentation functions with thoughtful interface design. *Mar 96, p. 106.* **Editors' Choice** for best natural draw software.

★★★/6.2 **LightningDraw GX 1.0,** Lari Software, 919/968-0701, $299. Lets you combine colors and shapes and experiment with QuickDraw GX fonts. *Mar 96, p. 106*

★★★★/7.2 **Live Picture 2.5,** Live Picture, 408/464-4200, $995. Lacks support for the blend modes and numerical focus controls and can only edit the topmost visible layer, but is superfast and its core technology remains as superior as ever. *Jun 96, p. 78*

★★★★/8.1 **Macromedia FreeHand 5.5,** Macromedia, 415/252-2000, $595. Draw program outperforms competitor, for now. *Feb 96, p. 74*

★★★★/8.5 **MapArt Cartographic Data Bank 1.0,** Cartesia Software, 609/397-1611, $249 per volume, $399 for both. Detailed, editable maps spice up your layouts. *May 96, p. 72*

★★★★/7.8 **MapArt Designer Series 1.0,** Cartesia Software, 609/397-1611, $129 per volume, $199 for both. Detailed, editable maps spice up your layouts. *May 96, p. 72*

★★★★/8.1 **MiniCad 6,** Graphsoft, 410/290-5114, $795. Nothing's small about this modular package. *Mar 96, p. 65*

★★★★/8.9 **Painter 4.0,** Fractal Design, 408/688-5300, $549. Painter 4.0 is the program most artists should own; its painting and special-effects capabilities simply can't be beat. *Jun 96, p. 78*

★★★★/7.2 **QX-Tools 1.0,** Extensis, 503/274-2020, $149. Ten XTensions that make QuarkXPress more powerful. *Feb 96, p. 73*

★★★ **Ray Dream Designer 3.1.1,** Ray Dream, 415/960-0768, $349. 3-D graphics program provides competent modeling tools and excellent rendering. *Mar 95, p. 61*

★★★/6.9 **Ray Dream Studio 1.0,** Ray Dream, 415/960-0765, $499. These 3-D design tools are competent and affordable. *May 96, p. 58*

★★★/6.5 **theFONDler 4.0.1,** Rascal Software, 805/255-6823, $69.95. Font utility diagnoses problems. *Apr 96, p. 84*

★★★/5.0 **Tracer 1.0,** ScanVec, 508/694-9488, $795. Excellent but expensive autotracing. *Feb 96, p. 85*

★★★★/8.7 **upFront 2.0.1,** SketchTech, 612/379-1435, $299. A new vendor—SketchTech—improves Alias's venerable entry-level 3-D modeling package. *Mar 96, p. 86*

★★★ **Working Model,** Visual Basic, 415/574-7777, $2495. Motion-simulation system is a fine product, but a Power Mac version is needed. *Dec 95, p. 79*

★★★/6.3 **xRes 2.0,** Macromedia, 415/252-2000, $799. Although considerably improved, fast, and easy to learn, this image editor still leaves room for improvement. *Jun 96, p. 78*

MATH/SCIENCE

★★★★/7.5 **Igor Pro 2.0.4,** WaveMetrics, 503/620-3001, $495. Top-notch scientific graphing package. *Feb 96, p. 90*

★★★★/8.4 **JMP In 1.0,** Duxbury Press, 800/354-9706 (U.S. only), $54. Student version of stats heavyweight sets the standard. *Jul 96, p. 79*

★★★★ **LabView 3.1,** National Instruments, 512/794-0100, $1995. Instrumentation software can emulate most scientific and electronic test-bench instruments. *Nov 95, p. 62*

★★★★/7.2 **Minitab 10 Xtra,** Minitab, 814/238-3280, $895. Updated package offers a complete statistical tool kit. *Jun 96, p. 66*

★★★★/7.4 **Spreadware Statistics Menu 4.0,** Spreadware, 619/772-1758, $229. Excel users can put Spreadware's statistics to work in minutes. *Apr 96, p. 72*

★★★★/7.1 **SPSS 6.1,** SPSS, 312/329-2400, $695; modules $395 to $495. Mainframe statistics giant has new Mac interface. *Feb 96, p. 82*

★★★★/8.3 **StatView 4.5,** Abacus Concepts, 510/540-1949, $595. Statistics and graphing package. *Feb 96, p. 81*

ORGANIZATION/PRODUCTIVITY

★★★/5.1 **ACT for Macintosh 2.5.1,** Symantec, 541/334-6054, $169.95. A weak offering in the field of contact-management and scheduling software, where you don't have to compromise. *Jul 96, p. 62*

★★/4.8 **ACT for Newton 1.0,** Symantec, 541/334-6054, $99.95. Only die-hard fans of the desktop version could love this portable PIM. *Jul 96, p. 62*

★★★/6.8 **Claris Organizer 1.0,** Claris, 408/987-7000, $49 (estimated). This simple little PIM is fast, easy to learn, and intelligently designed. *Jun 96, p. 106*

★★★/6.9 **DateBook Pro 4.2,** Now Software, 503/274-2800, $69.95 (estimated). A well-designed but often sluggish calendar and scheduling program. *Jun 96, p. 106*

★★/3.7 **Day-Timer Organizer 2.0,** Day-Timer Technologies, 415/572-6260, $59.95. PIM has some rough edges. *Mar 96, p. 92*

★★★/5.2 **Full Contact 3.0,** Pitch Software, 408/374-5504, $199. Resurrected PIM has been improved—but not enough. *Jun 96, p. 70*

★★★/6.5 **In Control 3.5,** Attain, 617/776-1110, $219.95. This planner/outliner excels in list management, but not as a calendar or scheduler. *Jun 96, p. 106*

★★★/6.9 **InTouch 2.5.2,** Prairie Group, 515/225-3720, $49.95. A simple contact manager that doesn't force you to plug information into designated slots. *Jun 96, p. 106*

★★★/5.4 **KeyQuencer,** available online, shareware. Relatively powerful shareware macro program is inexpensive, but doesn't allow you to record macros. *Jun 96, p. 106*

★★★/6.9 **Micro Planner Manager 1.4,** Micro Planning International, 303/757-2216, $695. Project-management application takes scheduling seriously. *Jun 96, p. 65*

★★★ **Microsoft Works 4.0,** Microsoft, 206/882-8080, $99.95. Good word processing and drawing tools; poor spreadsheet and database modules. *Jan 95, p. 63*

★★★★ **Now Up-to-Date and Contact 3.5,** Now Software, 503/274-2800, $99. Calendar/address book combo features several enhancements. *Nov 95, p. 68*

★★★★/7.4 **QuicKeys 3.0.1,** CE Software, 515/221-1801, $119. The hands-down winner for an easy way to automate repetitive tasks using macros. *Jun 96, p. 106*

★★★/6.9 **Tempo II Plus 3.0.9,** Affinity Microsystems, 303/442-4840, $179.95. Powerful macro program suffers from undue complexity and an awkward interface. *Jun 96, p. 106*

★★★/6.8 **TouchBase Pro 4.2,** Now Software, 503/274-2800, $69.95 (estimated). Slow, but offers up to 16 custom fields. *Jun 96, p. 106*

PRESENTATION TOOLS

★★★★ **Adobe Premiere 4.0 (4.0.1),** Adobe Systems, 415/961-4400, $795. Advances far and above its competitors with professional-level features. *Dec 94, p. 54*

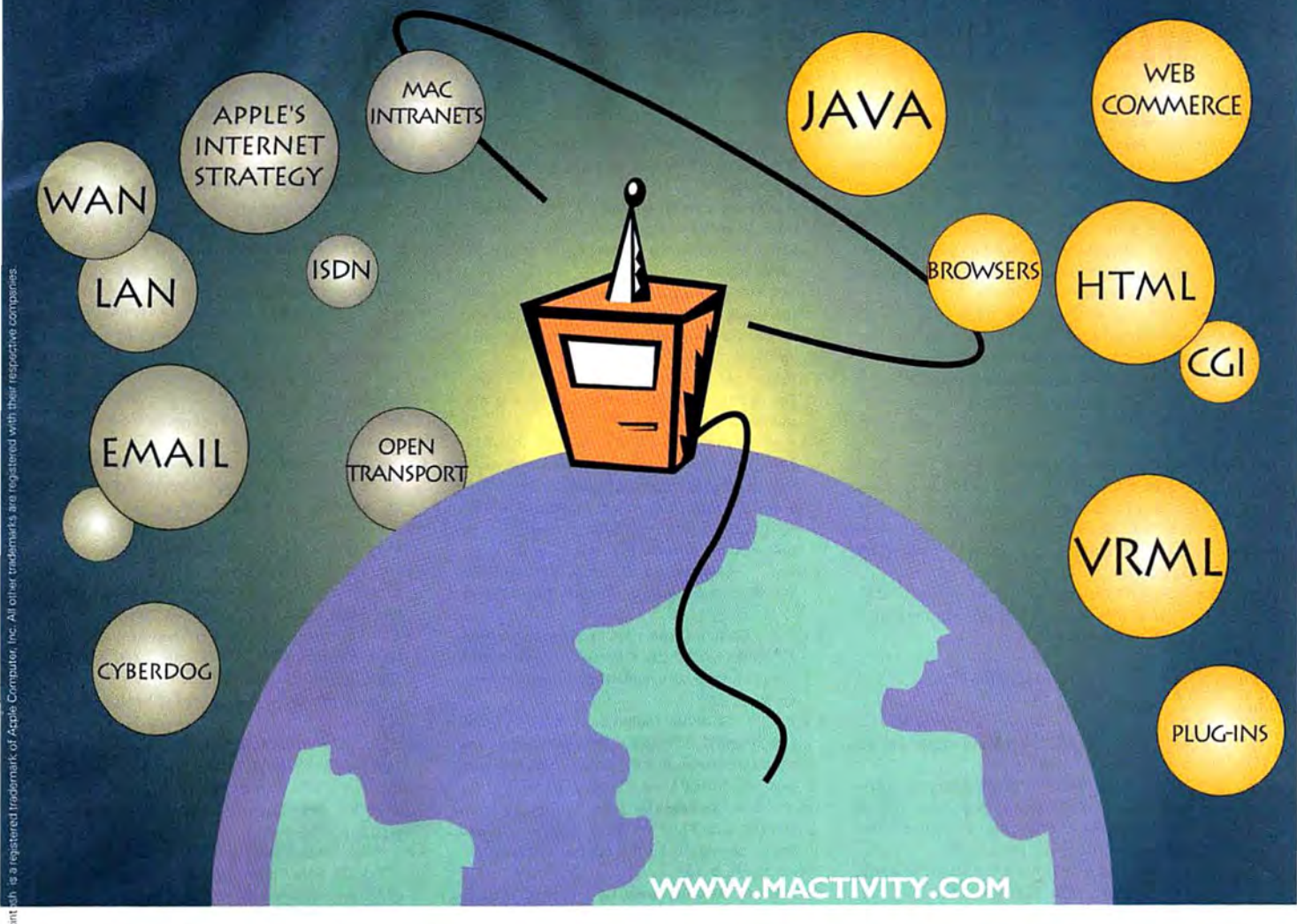
★★★★/7.1 **Astound 2.0,** Gold Disk, 408/982-0200, $249. Presentation graphics with a multimedia twist. *Mar 96, p. 73*

★★★★/7.1 **Deck II 2.5,** Macromedia, 415/252-2000, $399. Deck II widens its lead over other software-only multitrack programs. *Jun 96, p. 52*

★★★★/7.2 **Director 5.0,** Macromedia, 415/252-

continues

Where the Mac Meets the Internet



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Star Ratings

2000, $1195. Multimedia authoring tool gets polish and a performance boost. *Jul 96, p. 52*

★★/3.5 **Mediagnügen 1.0.1,** Gnügen Software, 303/682-5380, $29.98. Almost useless as a serious browser; lets you view and copy collections of images, but not organize and sort them. *Apr 96, p. 67*

★★★/6.9 **Microsoft PowerPoint 4,** Microsoft, 206/882-8080, $295 (estimated). A solid, simple-to-use slide machine. *Jun 96, p. 98*

★★★/6.5 **Movie Cleaner Pro 1.1.1,** Terran Interactive, 408/353-8859, $129. QuickTime-compression utility for crisp CD-ROM movies. *Apr 96, p. 69*

★★★/6.4 **Persuasion 3.0,** Adobe Systems, 206/470-7000, $259 (estimated). Hard to use, but offers every presentation effect a pro could need. *Jun 96, p. 98*

★★/4.0 **ProView 1.1,** E-magine, 818/881-4757, $69.95. Adequate tool for assembling an electronic portfolio or online manual. *Apr 96, p. 67*

★★★★/7.0 **SoundEdit 16 2.0,** Macromedia, 415/252-2000, $399. The premier Mac sound-editing program just gets better. *Jun 96, p. 52*

★★/4.9 **STiP Professional 2.1,** MacVonk, 403/232-6545, $1295. Multimedia authoring program is promising but flawed. *Apr 96, p. 75*

PROGRAMMING

★★★★/8.4 **CodeWarrior Gold 7,** Metrowerks, 512/305-0400, $399. Key Power Mac compiler gets yet another face-lift. *Mar 96, p. 69*

★★★/6.9 **FutureBASIC II,** Staz Software, 601/255-7085, $229. Complete friendly BASIC programming environment but no Power Mac support and some problems with numerics. *Jul 96, p. 81*

★★★★/8.0 **LS FORTRAN 1.1,** Fortner Research, 703/478-0181, $695. FORTRAN rides again, running science programs on the Power Mac desktop. *Feb 96, p. 95*

★★★★/7.0 **Roaster DR1,** Natural Intelligence, 617/876-7680, $299. Fast Java compiler, but some compatibility problems with Sun's Java standard. *Jul 96, p. 92*

★★★★/8.4 **Scripter 1.0.1,** Main Event Software, 202/298-9595, $199. AppleScript development system offers serious debugging power. *Mar 96, p. 88*

★★★★/7.0 **Tools Plus 2.6,** Water's Edge Software, 416/219-5628. For Symantec's C/C++ and Pascal, $149 each; for both, $199; for CodeWarrior Bronze, $199; for CodeWarrior Gold, $249. Programmers' tool kit saves time. *Feb 96, p. 92*

★★★★/8.0 **VIP C 2.0,** Mainstay, 805/484-9400, $495. Impressive update of slick coding tool. *Jul 96, p. 80*

★★★/6.6 **Visual C++ 4.0 Cross-Development Edition,** Microsoft, 800/426-9400, $1999. Program in Windows, port effortlessly to the Mac. *Jul 96, p. 71*

UTILITIES

★★★/6.4 **ACT 2.5,** Symantec, 541/334-6054, $249.95. This full-featured contact manager offers strong database features, but the interface is not easy to use. *Jun 96, p. 106*

★★★★/7.3 **Adobe Fetch 1.2,** Adobe Systems, 415/961-4400, $149. Catalog graphics, text, and more for easy organization and retrieval. *Apr 96, p. 102*

★★★★/8.7 **Adobe Type Manager 3.9,** Adobe Systems, 415/961-4400, $39.95. Accurately renders PostScript fonts at all sizes on screen and on any printer. *Apr 96, p. 102*

★★★★/7.3 **AliasZoo 2.0.5,** Blue Globe Software, shareware, $15. Locates and fixes orphaned aliases and deletes unneeded ones. *Apr 96, p. 102*

★★★/6.9 **Anubis 2.54,** CharisMac Engineering, 916/885-4420, $129.95. Disk formatter is reliable, easy to use. *May 96, p. 76*

★★★ **Arcserve for Macintosh 1.5,** Cheyenne Software, 516/484-5110, $245 (5 users); $495 (20 users). A good backup program for mixed-platform networks. *Jan 96, p. 63*

★★★★★/9.3 **AreaCodeFinder 4.0,** John Calande, shareware, $15. Identifies the location (and time zone) of a telephone area code and vice versa. *Apr 96, p. 102*

★★★/6.2 **At Ease 3.0,** Claris, 408/727-8227, $46. This desktop alternative lets you share your Mac and worry less. *Feb 96, p. 81*

★★★★ **BeyondPress 1.0,** Astrobyte LC, 303/534-6344, $595. QuarkXPress XTension is a great way to convert documents to Web pages. *Dec 95, p. 73*

★★★★/7.3 **Calc+ 2.0,** Abbott Systems, 914/747-4201, $29. Simple calculator has a resizable, scrollable, editable, printable tape. *Apr 96, p. 102*

★★★/5.7 **Captivate 4.5,** Mainstay, 805/484-9400, $89.95. Screen grabber fumbles but survives. *Jun 96, p. 74*

★★/3.8 **CD AutoCache 1.1,** CharisMac Engineering, 916/885-4420, $79.95. Offers nice interface, but is buggy and provides minimal performance boost. *Jun 96, p. 62*

★★★/5.4 **CD-ROM ToolKit 2.0.1,** FWB Software, 415/325-4392, $79. Offers attractive interface and reliable performance, but is RAM-hungry with minimal performance boost. *Jun 96, p. 62*

★★★★/7.6 **DeBabelizer 1.6.5,** Equilibrium Technologies, 415/332-4343, $399. Endlessly talented and exasperating batch processor for bitmap graphics. *Apr 96, p. 102*

★★★★/8.6 **Desktop Dialer 1.4.2,** Sophisticated Circuits, 206/485-7979, $75. Dials phone numbers appearing in any document. *Apr 96, p. 102*

★★★★/7.8 **DiskExpress II 2.20,** Alsoft, 713/353-4090, $89.95. Intelligently defragments hard drives for optimum drive performance. *Apr 96, p. 102*

★★★/6.8 **DOS Mounter 95 1.0,** Software Architects, 206/487-0122, $100. Windows-to-Mac file-transfer utility gets Win 95–savvy. *Mar 96, p. 74*

★★★★/8.1 **DragStrip 2.0,** Natural Intelligence, 617/876-7680, $59.95. Feature-packed file launcher well worth the premium price. *Apr 96, p. 102*

★★★★/8.3 **Exodus 5.2.1,** White Pine Software, 603/886-9050, $295. All around, the best for price/performance and X protocol support. *May 96, p. 108.* Editors' Choice for best X Window server software.

★★★/6.7 **GrabNet 2.0,** ForeFront Group, 713/961-1101, $19.95. Bookmark manager for Netscape Navigator grabs Web graphics and text. *Apr 96, p. 102*

★★★★/7.6 **MacLinkPlus/Translators Pro 8.06la,** DataViz, 203/268-0030, $149. Excellent PC to Mac (or reverse) conversions for word processor, spreadsheet, or database documents. *Apr 96, p. 102*

★★/4.5 **MacOpener 1.0,** DataViz, 203/268-0030, $75. Unintuitive Mac-to-Windows file-transfer utility. *Mar 96, p. 75*

★★★/6.7 **MacTools Pro 4.0,** Symantec, 541/334-6054, $149.95. A respectable troubleshooting and data-recovery program for a reasonable price. *Jun 96, p. 106*

★★★/6.7 **MacX 1.5,** Apple Computer, 408/996-1010, $295. Window server software offers acceptable performance, but it's not the leader in the category. *May 96, p. 108*

★★★/6.8 **Norton Utilities 3.2,** Symantec, 541/334-6054, $149.95. An easy-to-use tool kit that works wonders on bad disks, corrupted files, and crashed hard drives. *Jun 96, p. 106*

★★★★/7.6 **Now Utilities 5.0 (5.0.2),** Now Software, 503/274-2800, $89 (estimated). This utility package streamlines your work with fast access to frequently used files, folders, and programs. *Jun 96, p. 106*

★★★★/7.1 **OmniPage Pro 6.0,** Caere, 408/395-7000, $699. Flagged-text feature is indispensable and handles gray-scale graphics. *Jun 96, p. 54*

★★★/5.1 **OneClick 1.0.1,** Westcode, 619/487-9200, $129. Promising button-based macro utility needs fine-tuning. *May 96, p. 67*

★★★★/7.1 **OptiMem RAM Charger 2.12,** Jump Development Group, 412/681-2692, $129. Increases RAM available for applications by allocating it more efficiently. *Apr 96, p. 102*

★★★★/8.3 **PopupFolder 2.0.1,** Inline Software, 617/938-8088, $79. Improves Finder navigation via ubiquitous pop-up menus. *Apr 96, p. 102*

★★★★ **QuicKeys 3.0,** CE Software, 515/221-1801, $139. Easy-to-use shortcut manager. *Mar 94, p. 61*

★★★★/8.6 **RAM Doubler 1.6,** Connectix, 415/571-5100, $99. Fools your Mac into thinking it has twice the RAM it actually does. *Apr 96, p. 102*

★★★★/8.9 **Retrospect 3.0; Retrospect Remote 3.0,** Dantz Development, 510/253-3000. Retrospect, $249; Retrospect Remote (10 users), $449. Backup programs now even more powerful, easier to use. *Apr 96, p. 61*

★★★/5.7 **SAM 4.0.8,** Symantec, 541/334-6054, $69. SAM finds viruses, kills 'em. *Jul 96, p. 72*

★★★★/8.4 **SCSI Director Pro 4.0,** Transoft, 805/897-3350, $99.95. Hard disk formatting and testing utility. *Feb 96, p. 86*

★★★★/8.9 **Speed Doubler 1.0.2,** Connectix, 415/571-5100, $99. Connectix makes a Power Mac's 680X0 emulation feel native. *Feb 96, p. 56*

★★★★/7.9 **StuffIt Deluxe 3.5,** Aladdin Software, 408/761-6200, $129.95. Macintosh, PC, and Internet file compression and decompression. *Apr 96, p. 102*

★★★★/8.9 **SuperATM 3.9,** Adobe Systems, 415/961-4400, $69. ATM's PostScript font rendering plus intelligent substitution of missing fonts. *Apr 96, p. 102*

★★★★/7.0 **TextBridge Pro 3.0,** Xerox, 508/977-2000, $349. Supports graphics, but does not flag unrecognized text. *Jun 96, p. 54*

★★★★/7.2 **Transverter Pro 3.0.1,** TechPool Software, 216/291-1922, $399. Batch-process PostScript files or preview them to catch mistakes before printing. *Apr 96, p. 102*

★★★★/7.5 **TypeIt4Me 4.5.1,** Riccardo Ettore, shareware, $30. Automatically expands user-defined abbreviations in any application. *Apr 96, p. 102*

★★★★/8.5 **TypeTamer 1.1.1,** Impossible Software, 714/470-4800, $59.95. Every conceivable Font menu improvement in one well-designed program. *Apr 96, p. 102*

★★★/6.5 **XoftWare for MacOS 3.0,** NetManage, 619/755-3998, $295. X Window server software taken from Apple's MacX code, XoftWare turns in similar performance at a similar price. *May 96, p. 108*

★★★★/8.1 **XTen 6.0,** Tenon Intersystems, 805/963-6983, $350. A speed demon, but be sure you're willing to be a Unix guru before choosing it.

continues

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Star Ratings

May 96, p. 108. Editors' Choice for best X Window server software.

VERTICAL MARKETS

★★★★/8.1 **Finale 3.5.1,** Coda Music Technology, 612/937-9611, $545. Music-notation software goes Power Mac native. *May 96, p. 81*

★★★/6.9 **Quicken Family Lawyer 6.0b,** Parsons Technology, 319/395-9626, $49. Helps you prepare 61 legal documents. *Feb 96, p. 88*

WRITING TOOLS

★★/3.0 **Indexicon 1.0,** Iconovex, 612/896-5100, $129. Word 6 indexing tool has trouble identifying indexable terms. *Apr 96, p. 77*

★★★/6.7 **Microsoft Word 5.1,** Microsoft, 206/882-8080, $320 (estimated). Fast, sleek, stable, and probably the most widely used Mac word processor on earth. *Jun 96, p. 98*

★★★/5.1 **Microsoft Word 6.0.1,** Microsoft, 206/882-8080, $295 (estimated). Word 6, the most bloated word processor on earth, may be mandatory in big corporations. *Jun 96, p. 98*

★★★★/7.1 **Spelling Coach Professional 4.1,** Deneba Software, 305/596-5644, $69.95. Adds dictionary and thesaurus to almost any application. *Mar 96, p. 80*

★★★★/7.4 **WordPerfect 3.5,** Corel, 613/728-8200, $129 (estimated). In speed, interface efficiency, and Macintosh integration, WordPerfect beats all competitors. *Jun 96, p. 98*

hardware

INPUT DEVICES

★★/4.7 **Adjustable Keyboard,** Apple Computer, 408/996-1010, $119. Adjustable split keyboard, but with small function keys. *May 96, p. 98*

★★★★ **ArtZ II,** Wacom Technology, 360/750-8882, $389.99. Graphics tablet has unique stylus that erases as well as draws. *Dec 95, p. 79*

★★★/6.1 **BAT Personal Keyboard,** Infogrip, 805/652-0770, $199. Chording device takes time to learn. *May 96, p. 98*

★★★/6.0 **Comfort Keyboard,** Health Care Keyboard, 414/536-2160, $795. Expensive keyboard has separate sections that adjust independently. *May 96, p. 98*

★★★/5.8 **DataHand,** DataHand Systems, 602/860-8584, $995. Costly, but requires much less arm and hand motion than other text-input devices. *May 96, p. 98*

★★★/6.0 **Desktop GlidePoint,** Alps Electric, 408/432-6000, $99.95. Average touchpad whose biggest selling points are adjustable base and edge-detection. *May 96, p. 98*

★★★/6.0 **GlidePoint Desktop,** Cirque, 801/467-1100, $99.95. Similar to Alps input device, but without detachable base. *May 96, p. 98*

★★★/5.3 **GyroPoint Desk 1.0,** Gyration, 408/255-3016, $149. Mouse works on or off the desk. *Jul 96, p. 76*

★★★★/7.5 **Hitachi StudioPad,** Hitachi Digital Graphics, 408/747-0777, $199.99. Graphics tablet for tight quarters. *Apr 96, p. 70*

★★★/5.2 **MacTrac Deluxe,** MicroSpeed, 510/490-1403, $99. Good, basic trackball. *May 96, p. 98*

★★★/5.6 **Microsoft Natural Keyboard,** Microsoft, 800/426-9400, $99.95. Inexpensive split keyboard with integrated wrist rest. *May 96, p. 98*

★★★/5.1 **Mouse Pen Mac 3.0,** Fellowes, 708/893-1600, $39.99. Versatile, inexpensive penlike pointing device. *May 96, p. 98*

★★★/6.2 **Mouse-Trak,** Itac Systems, 214/494-3073, $179. Well-built trackball with good ball dynamics. *May 96, p. 98.* Editors' Choice for best input devices.

★★★/5.0 **PenDirect ADB,** FTG Data Systems, 714/995-3900, $398. PenDirect controls cursor on monitors, but with less precision than touch screen. *May 96, p. 98*

★★/4.4 **PointPad,** Hagiwara Sys-Com, 619/546-9989, $89. Responds to direct pressure but awkward for dragging. *May 96, p. 98*

★★★/6.4 **RemotePoint,** Interlink Electronics, 805/484-1331, $159.95. Wireless pointer works well for stand-up presentations. *May 96, p. 98*

★★★★/7.4 **Thinking Mouse 5.0,** Kensington Microware, 415/572-2700, $89.99. Four-button mouse with excellent software. *May 96, p. 98.* Editors' Choice for best input devices.

★★/4.3 **TouchPad,** Touché Technologies, 415/331-6622, $59.95. This touchpad suffers from small buttons that can't be customized. *May 96, p. 98*

★★★/6.7 **Tru-Form,** Adesso, 213/294-4300, $89-$99. Good split keyboard design with integrated pointing device. *May 96, p. 98*

MISCELLANEOUS HARDWARE

★★/4.0 **Brother MFC 4000ML,** Brother, 908/356-8880, $1000 plus $89 for Mac interface. Fax-copier-printer's top-notch fax features are marred by touchy printing. *May 96, p. 69*

★★★/6.4 **Chinon ES-3000,** Chinon America, 310/533-0274, $1095. Digital camera zooms in but with the high price doesn't measure up to Kodak Digital Camera 40's. *Mar 96, p. 77*

★★★ **Kodak Digital Camera 40,** Eastman Kodak, 716/726-7260, $995. Digital camera can use 37mm lens but has some flaws. *Jan 96, p. 59*

★★★ **SoftBoard Model 205,** Microfield Graphics, 503/626-9393, $2795. Electronic whiteboard is expensive but does the job. *Jan 96, p. 71*

★★★/5.9 **Sony PC Cam,** Sony Electronics, 941/731-4940, $499. This desktop camera lacks AV strength; its competitor—VideoLabs' FlexCam—is simply the better camera. *Apr 96, p. 77*

MODEMS/NETWORK HARDWARE

★★★/6.3 **28.8 CruiseCard,** Megahertz, 801/320-7000, $299. Another economical PC Card modem with good performance but low connect (reliability) rates. *Jul 96, p. 141*

★★★/6.9 **3Com Impact,** 3Com, 408/764-5000, $549. This ISDN terminal adapter features easy-to-use installation software. *May 96, p. 54*

★★★★/7.7 **BitSurfr Pro,** Motorola, 205/430-8000, $495. This ISDN terminal adapter offers a good value. *May 96, p. 54*

★★/4.8 **Communicard 28.8,** Dayna Communications, 801/269-7200, $416, $359 without cellular capability (estimated prices). Expensive PC Card modem, without digital line protection frequently found in similar cards. *Jul 96, p. 141*

★★/4.6 **Courier I-Modem with ISDN/V.34,** U.S. Robotics, 847/676-7010, $895. This ISDN terminal adapter is expensive and lacks features. *May 96, p. 54*

★★★/6.0 **DF2814,** TDK Systems, 916/478-8421, $379. Although boosted by low price and a 5-year warranty, the PC Card modem was bogged down by JPEG file transfer. *Jul 96, p. 141*

★★★/5.4 **EFM 288XJ,** Epson America, 310/782-0770, $299. In our tests it's a fast PC Card modem, but with a low call-connect (reliability) score. *Jul 96, p. 141*

★★★/6.2 **MacClass 288 V.34,** Practical Peripherals, 770/840-9966, $299. PC card modem has acceptable performance with a nice price and a lifetime warranty. *Jul 96, p. 141*

★★ **Manta 500EN; Starfish Ethernet Access Point,** Digital Ocean, 913/888-3380. Manta $799; Starfish $1850. Wireless-communications package is capable but much too expensive. *Dec 95, p. 77*

★★★/5.4 **Mobile Plus Macintosh,** Apex Data, 510/623-1231, $307. PC card modem has a long, five-year warranty, but not much else to recommend it. *Jul 96, p. 141*

★★★/6.6 **Optima 288 V.34,** Hayes Microcomputer Products, 770/441-1617, $319. PC card modem is an excellent performer with a great price and warranty. *Jul 96, p. 141*

★★★★/8.0 **PowerPort Platinum PC Card,** Global Village Communication, 408/523-1000, $399. A complete, well-conceived mobile communications package for the Macintosh. *Jul 96, p. 141.* Editors' Choice for best PC card modems.

★★★/6.3 **QuickStream/3,** Sonic Systems, 408/736-1900, $995; dial-out option $249. Three-port remote-access server is priced right but has its limitations. *Apr 96, p. 62*

★★★/5.4 **SafeJack,** Angia Communications, 801/371-0488, $299. Lifetime warranty for this PC card modem, but no bundled software. *Jul 96, p. 141*

★/2.6 **Smart One 2834VLXMac,** Best Data Products, 818/773-9600, $269. This voice modem is not a smart choice. *Jun 96, p. 76*

★★/4.3 **SmartLink V.34 2834 PCA,** Archtek America, 818/912-9800, $349. PC card modem has no Mac documentation. *Jul 96, p. 141*

★★★★/8.2 **TribeLink2,** Tribe Computer Works, 510/814-3900, $1295; dial-out option $200; additional PPP client licenses $145 for 10 users to $1495 for 500. Two-port remote-access server features Web-based administration. *Apr 96, p. 62*

PRINTERS

★★★/5.2 **1060E,** QMS, 334/633-4300, $2399. Average quality, but supplies only available from QMS. *Jun 96, p. 116*

★★★/5.3 **1660E,** QMS, 334/633-4300, $3999. Average quality printer that does not print envelopes. *Jun 96, p. 116*

★★★/5.6 **4520mp,** Xerox, 716/442-4028, $4070. Slightly above average speed and quality, and comes with three input trays. *Jun 96, p. 116*

★★★/5.7 **Accel-a-Writer 8200,** Xanté, 334/476-8189, $4495. Can handle large paper and offers halftone calibration, but output quality only average. *Jun 96, p. 116*

★★★/6.9 **Apple Color StyleWriter 1500,** Apple Computer, 408/996-1010, $289. Low-cost color ink-jet offers a bargain-priced option for the casual user. *Jul 96, p. 59*

★★★★/7.0 **Apple Color StyleWriter 2200,** Apple Computer, 408/996-1010, $419. The (almost) per-

fect printing companion for your PowerBook. *Apr 96, p. 133*

★★★★/7.2 **Apple Color StyleWriter 2400,** Apple Computer, 408/996-1010, $429. Very good print quality at a reasonable price. *Apr 96, p. 133.* Editors' Choice for best midrange color ink-jet printers.

★★★★/7.5 **Apple Color StyleWriter 2500,** Apple Computer, 408/996-1010, $389. Color ink-jet has quality and speed that small-office users will find valuable. *Jul 96, p. 59*

★★★/6.2 **Canon BJC-210,** Canon Computer Systems, 714/438-3000. $299. Small footprint and low price, but only an average performer. *Apr 96, p. 133*

★★★★/7.1 **Canon BJC-4100,** Canon Computer Systems, 714/438-3000, $399. Excellent print quality and can be used with a PC. *Apr 96, p. 133.* Editors' Choice for best midrange color ink-jet printers.

★★★★/7.2 **Epson Stylus Pro,** Epson America, 310/782-0770, $999. Top-notch 720-dpi output, sprightly performance; a bargain alternative to dye-sub printers. *Apr 96, p. 133.* Editors' Choice for best high-end color ink-jet printers.

★★★★ **Fargo FotoFun,** Fargo Electronics, 612/941-9470, $399.95. Dye-sublimation printer produces good output at a reasonable price. *Jan 96, p. 61*

★★/3.9 **FS-1600A,** Kyocera, 908/560-3400, $2495. This inexpensive printer is slow and offers poor print quality. *Jun 96, p. 116*

★★/4.1 **FS-3600A,** Kyocera, 908/560-3400, $4278. Good paper-handling options, but slow for graphics and offers poor print quality. *Jun 96, p. 116*

★★★/5.1 **HP Color LaserJet 5M,** Hewlett-Packard, 800/752-0900, $9195. HP loses on all counts to the Tektronix Phaser 550. *Jun 96, p. 51*

★★★/5.4 **HP CopyJet M,** Hewlett-Packard, 800/752-0900, $3649. Color copier and ink-jet printer in a single unit. *Feb 96, p. 77*

★★★/6.3 **HP DeskWriter 660C,** Hewlett-Packard, 208/323-2551, $499. Poor color accuracy, blocky text and slow print speeds; easily networked. *Apr 96, p. 133*

★★★/5.2 **HP LaserJet 4M Plus,** Hewlett-Packard, 408/246-4300, $2479. Good print quality, but below average speed. *Jun 96, p. 116*

★★★/6.0 **HP LaserJet 4MV,** Hewlett-Packard, 408/246-4300, $3459. Strong tabloid size printer with good speed and adequate print qualty. *Jun 96, p. 116*

★★★/5.9 **HP LaserJet 5M,** Hewlett-Packard, 408/246-4300, $2229. A good workgroup printer gets better. *Jul 96, p. 56*

★★★/6.5 **HP LaserJet 5Si MX,** Hewlett-Packard, 408/246-4300, $4899. Pricey, but offers top speed and quality. *Jun 96, p. 116.* Editors' Choice for best workgroup printers.

★★★★ **LaserWriter 4/600 PS,** Apple Computer, 408/996-1010, $929. Compact printer produces great-looking 600-dpi output. *Dec 95, p. 60*

★★★/5.7 **LaserWriter 16/600 PS,** Apple Computer, 408/996-1010, $1950 (estimated). Good performance at a modest price, but lacks some convenience features. *Jun 96, p. 116*

★★/3.3 **microLaser PowerPro/12,** Texas Instruments, 817/774-6000, $1998. Inexpensive, but offers poor output quality and very slow Photoshop printing. *Jun 96, p. 116*

★★★/5.8 **Optra Lx+,** Lexmark, 606/232-2000, $3249. Good print quality and paper handling are offset by slow speed for graphics. *Jun 96, p. 116*

★★★★/7.9 **Tektronix Phaser 550,** Tektronix, 503/682-7377, $6995. The Phaser 550 beats HP Color LaserJet 5M on speed, resolution, and price. *Jun 96, p. 51*

★★★/5.3 **Typhoon 16,** Dataproducts, 805/578-4000, $3699. Solid printer, especially for mixed-platform environment; average output quality. *Jun 96, p. 116*

★★★ **Typhoon 8,** Dataproducts, 818/887-8000, $3100 (600 dpi, 4MB of RAM); $5199 (1200 dpi, 36MB of RAM). Workgroup printer offers top-notch 1200-dpi output but is a bit pricey. *Dec 95, p. 64*

★★ **Xerox 4510ps,** Xerox, 800/349-3769, $1745. Printer has neither the performance nor the quality to justify its price. *Dec 95, p. 68*

SCANNERS

★★★/5.1 **Apple Color OneScanner 600/27,** Apple Computer, 408/996-1010, $629. New version of the Color OneScanner has little to offer. *Jul 96, p. 54*

★★/3.3 **ArtiScan Z1-600,** Tamarack, 714/744-3979, $649. The ArtiScan Z1-600's poor software, manual, and scanning performance make it hard for us to recommend it, even at its low price. So we won't. *Mar 96, p. 118*

★★/3.7 **Biz Card Manager,** Electronic Document Technology, 408/733-7309, $369. Fast card scanner but more expensive, no automatic scanning or data transfer to contact managers, and makes errors. *Apr 96, p. 64*

★★/3.7 **Biz Card Reader,** Umax Technologies, 510/651-8883, $245. Exports automatically scanned data to contact managers, but uses a nonstandard SCSI connector and has no on/off switch. *Apr 96, p. 64*

★★/3.3 **Color OneScanner,** Apple Computer, 408/996-1010, $859. The Color OneScanner's anemic software bundle and lackluster performance would make it an unexceptional offer even if reasonably priced. *Mar 96, p. 118*

★★/3.1 **CS-300,** Ricoh, 408/954-5326, $599. The CS-300 scanner has one thing going for it: it's dirt cheap. Unfortunately, with performance, software, and documentation this weak, it's still overpriced. *Mar 96, p. 118*

★ **Digital Fotovix IIIS-D,** Tamron Industries, 516/484-8880, $2299. Video slide scanner's image quality doesn't measure up to the competition. *Jan 96, p. 67*

★★★/5.4 **EasyPhoto Reader,** Storm Software, 415/691-6600, $259. Small-format photo scanner has its limits. *May 96, p. 66*

★★★★/7.2 **ES-1200C,** Epson, 310/782-0770, $1299. The ES-1200C scanner has great image quality, respectable speed, and good software. *Mar 96, p. 118.* Editors' Choice for best midrange scanners.

★★★★/7.1 **Gemini D-16,** Umax, 510/651-4000, $1895–$1995. Both a 400-dpi and 800-dpi scanner, depending on the scanning area, but for several hundred dollars above its competitors, you'd better need that extra resolution. *Mar 96, p. 118*

★★★/6.1 **HP ScanJet 4c,** Hewlett-Packard, 408/246-4300, $1175. The HP ScanJet 4c is a respectable performer in all categories, though not exceptional. Limited software is its greatest weakness. *Mar 96, p. 118*

★★★/6.3 **HP ScanJet 4p,** Hewlett-Packard, 408/246-4300, $615. High price and slow scan times make the ScanJet 4p scanner a mediocre choice. *Jul 96, p. 54*

★★/3.8 **IX-4015,** Canon, 714/438-3000, $799. Boasts desk-space economy and an exceptional warranty, but its performance and software bundle are mediocre. *Mar 96, p. 118*

★★★/6.9 **Mac IRISPen,** Image Recognition Integrated Systems, 407/395-7831, $299. Portable, accurate pen OCR scanner. *Apr 96, p. 75*

continues

Circle 97 on reader service card

Star Ratings

★★★/6.6 **PageOffice,** Umax Technologies, 510/651-4000, $349. Personal page scanner shortchanges Mac users. *Jun 96, p. 58*

★★★★★/9.6 **PaperPort Vx,** Visioneer, 415/493-9599, $369. Desktop document scanner just gets bettter. *Mar 96, p. 82*

★★/4.0 **Paragon 1200SP,** Mustek, 714/250-8855, $899-$1000. The Paragon 1200SP is a disappointment, from its performance to its bare-bones manual. Proof that a 600-dpi, 30-bit scanner for $899 isn't a bargain. *Mar 96, p. 118*

★★★/5.0 **ScanMaker IIsp,** Microtek, 310/297-5000, $499–$699 (street). The ScanMaker IIsp is a shaky performer at best, especially when it comes to capturing highlight detail (it doesn't), but it's an option for the bargain hunter. *Mar 96, p. 118*

★★★/5.8 **ScanTouch AX-1200**, Nikon, 516/547-4355, $1720. The ScanTouch AX-1200 is a solid performer, but at this price it should be closer to stunning. *Mar 96, p. 118*

★★★/5.6 **Silverscanner III,** La Cie, 503/520-9000, $1499–$1699. The Silverscanner III is a good performer in many respects, but its poor color accuracy and high price place it behind the Epson ES-1200C on which it's based. *Mar 96, p. 118*

★★★/5.9 **StudioScan IIsi,** Agfa, 508/658-5600, $900 (street). The StudioScan IIsi gets good performance from its 30-bit, 400-dpi engine. Agfa's software is powerful and flexible, but could be easier to use. *Mar 96, p. 118*

★★★★/8.4 **Umax Vista-S6E,** Umax Technologies, 510/651-4000, $445. Despite its low price, the Vista-S6E is a clear best buy for anyone seeking a quality desktop scanner. *Jul 96, p. 54*

★★/3.8 **VIP Scan,** La Cie, 503/520-9000, $199. Scans automatically to contact manager; includes Now Contact; uses nonstandard SCSI connector. *Apr 96, p. 64*

SPEAKERS

★★★★/8.8 **Acoustimass,** Bose, 508/879-7330, $699. Full, rich, natural sound; treble slightly rolled off but clean. *Mar 96, p. 157.* Editors' Choice for best three-piece speakers.

★★★★/7.1 **ACS 52,** Altec Lansing, 717/296-2818, $128. Clean, reasonably solid presentation; crisp highs; powerful bass for such a small design. *Mar 96, p. 157*

★★★★/7.1 **AMX-16,** Radio Shack, 817/390-3300, $120 (street). Clean, reasonably crisp, slightly bright, decent bass, somewhat lacking in low-end heft. *Mar 96, p. 157*

★★★/6.8 **AppleDesign Powered Speakers,** Apple Computer, 408/996-1010, $179. Clean, reasonably solid presentation. Bass is good but doesn't shake the foundations. *Mar 96, p. 157*

★★/4.9 **AV270 Powered Speakers,** Advent, 708/317-3700, $179. Clean and smooth. Somewhat tinny quality to midrange and highs. *Mar 96, p. 157*

★★★/6.2 **AV622 Powered Speakers,** Advent, 708/317-3700, $299. Clean and smooth, with somewhat lightweight character. Slight treble emphasis. Bass has reasonable weight and impact. *Mar 96, p. 157*

★★★/5.2 **J-688AV,** Jazz, 818/336-2689, $149. Reasonably smooth sound, noticeably rolled-off high end, slightly harsh midrange becomes a bit fatiguing over a long listening session. *Mar 96, p. 157*

★★/4.7 **J-902,** Jazz, 818/336-2689, $150. Clear reproduction, with moderate bass emphasis and overemphasized treble. Generally thin sonic character because of the high-frequency emphasis. *Mar 96, p. 157*

★★★/5.8 **JPS 45,** Jensen, 708/317-3700, $149. Clean, reasonably crisp, slightly bright; an almost sandpapery affect on cymbals; adequate bass, somewhat lacking in low-end heft. *Mar 96, p. 157*

★★/3.5 **Labtec LCS-3210,** Labtec, 360/896-2000, $119 (street). Decent, slightly boomy bass, harsh midrange, rolled-off treble. Sound gets harsher when played at loud volumes. *Mar 96, p. 157*

★★★/6.2 **MA-12CP,** Roland, 213/685-5141, $319. Relatively warm, well-balanced sound; slightly lightweight bass. Tends to sound harsh when played at normal volume levels. *Mar 96, p. 157*

★★★★/7.8 **MediaMate,** Bose, 508/879-7330, $339. Full, warm, rich, natural sound. Amazingly robust for such a small speaker. *Mar 96, p. 157.* Editors' Choice for best desktop speakers.

★★★/6.6 **MLI-95,** Midi Land, 909/592-1168, $120. Surprisingly good sound for the money. Clean, reasonably clear; fine musical details a wee bit indistinct, good voice reproduction, adequate bass. *Mar 96, p. 157*

★★★★/7.5 **MMS 557,** Audio-Technica, 216/686-2600, $150. Relatively clean, slightly bright, crisp sound. Surprisingly robust bass for a small box.

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Mar 96, p. 157

★★★★/7.9 **SoundWorks,** Cambridge SoundWorks, 617/332-5936, $220. Clean, well-balanced sound, slight upper midrange emphasis, good bass. *Mar 96, p. 157.* Editors' Choice for best low-end three-piece speakers.

★★★/5.7 **SurroundSound ACS 500,** Altec Lansing, 717/296-2818, $450. Robust sound, slightly smeared highs, and slight harshness when played at loud volume. Bass is powerful, but a bit boomy. *Mar 96, p. 157*

★★/3.7 **SW150,** Koss, 414/964-5000, $180. Weak bass, harsh midrange, rolled-off treble. No saving graces. *Mar 96, p. 157*

★★★/6.4 **TC1490-7SUB,** Multimedia Labs, 410/429-4300, $249. Clean sound and thin balance; adjusting subwoofer output just makes bass boom, but bass is always lightweight. *Mar 96, p. 157*

★★★/6.4 **YST-SS1010,** Yamaha, 714/522-9240, $350. Relatively warm, well-balanced sound. Tends to sound harsh when played at loud volume levels. *Mar 96, p. 157*

SYSTEMS/STORAGE

★★★/5.1 **50 1GQ Series,** Liberty Systems, 408/983-1127, $699. Only its compact size and speed recommend this 1.1GB drive. *Jun 96, p. 153*

★★★/5.4 **50 2.1GQ Series,** Liberty Systems, 408/983-1127, $1099. 2.1GB drive offers good speed, good price, skimpy manual. *Jun 96, p. 153*

★★★/6.0 **Advantage 2000,** MicroNet Technology, 714/453-6100, $1080. 2.1GB drive is a top performer with a too-short warranty. *Jun 96, p. 153*

★★★/6.3 **Apple MessagePad 120,** Apple Computer, 408/996-1010, $699. Good software support and handwriting recognition help make this the best PDA. *Jul 96, p. 102*

★★★/6.0 **APS MS 2.0,** APS Technologies, 816/483-1600, $800. 2.1GB drive's good performance is enhanced by an excellent manual and software bundle. *Jun 96, p. 153*

★★★/6.4 **Blue Storm 2000,** Microtech, 203/468-6223, $2882. Expensive, but 2.4GB drive's strong performance and stackability help offset that. *Jun 96, p. 153*

★★★/5.5 **DCM 1200,** Direct Connections, 612/937-6283, $322. A decent performer, this 1.2GB drive offers a five-year warranty and a low price. *Jun 96, p. 153*

★★/3.6 **DCM 2400,** Direct Connections, 612/937-6283, $685. A slow performer, this 2.4GB drive also has ungainly ergonomics. *Jun 96, p. 153*

★★★★ **EZ135,** SyQuest Technology, 510/226-4000, $249. Removable drive is fast and comes with a fine selection of bundled software. *Dec 95, p. 58*

★★★★/7.0 **Genesis MP 528,** DayStar Digital, 707/967-2077, $9999. If you do extensive Photoshop work every day, and the Photoshop tasks you do benefit from the four CPUs, this system is worth its high price. *Jul 96, p. 84*

★★★/6.7 **Hammer PE 2000,** FWB, 415/325-4392, $1079. For the fastest performance, the Hammer PE 2000 is the choice. *Jun 96, p. 153.* Editors' Choice for best 1.0GB to 2.5GB hard drive.

★★★★/8.3 **Jaz Drive,** Iomega, 801/778-1000, $599.95. Iomega thinks big with Zip's new sibling. *Jun 96, p. 48*

★★★/5.2 **Magic Seagate Barracuda,** MacProducts USA, 512/892-4070, $1006. More expensive than MacProducts' almost-as-fast, same-capacity (2.1GB) Hawk drive. *Jun 96, p. 153*

★★★/5.6 **Magic Seagate Hawk,** MacProducts USA, 512/892-4070, $858. Pass-through power connector and a nice warranty distinguish this 2.1GB drive. *Jun 96, p. 153*

★★/4.2 **Magic Link PIC-2000,** Sony, 408/432-1600, $899. PDA has readable screen, with a built-in modem and great communications software; but too large, and few software titles available. *Jul 96, p. 102*

★★★/5.3 **MiniPak 2100,** Optima Technology, 714/476-0515, $975. 2.1GB drive is inexpensive but only a poor-to-average performer. *Jun 96, p. 153*

★★★★/7.0 **PDC 2400,** ProDirect, 612/941-1805, $800. 2.4GB drive is tops for speed, value, and design. *Jun 96, p. 153.* Editors' Choice for best 1.0GB to 2.5GB hard drive.

★★★/6.2 **PDI 1200,** ProDirect, 612/941-1805, $335. Average speed undermines 1.2GB drive's excellent design. *Jun 96, p. 153*

★★★/5.6 **Performa 5125CD,** Apple Computer, 408/996-1010, $2300. The all-in-one design is appealing, but the performance is just so-so. *Feb 96, p. 96*

★★★/5.1 **PocketHammer 2050,** FWB, 415/325-4392, $1479. Merely moderate performer, 2.1GB drive has hard-to-adjust settings. *Jun 96, p. 153*

★★★/5.8 **PowerBook 5300,** Apple Computer, 408/996-1010, $2300. A gray-scale screen and middling performance make this just an acceptable notebook. *Feb 96, p. 96*

★★★/5.9 **PowerBook 5300c,** Apple Computer, 408/996-1010, $4500. A great color screen and strong expandibility balance with so-so performance. *Feb 96, p. 58.* Editors' Choice for best portable Mac.

★★★/5.9 **PowerBook 5300cs,** Apple Computer, 408/996-1010, $3600. Good expansion, so-so speed, and a decent color screen make this fine for short-term use. *Feb 96, p. 96*

★★★/5.9 **PowerBook Duo 2300c,** Apple Computer, 408/996-1010, $3699 (8MB of RAM, 750MB hard drive); $4699 (20MB of RAM, 1.1GB hard drive, 14.4-Kbps fax modem). This new Duo packs a lot of power into a little package. *Apr 96, p. 58*

★★★/6.3 **PowerCenter 120,** Power Computing, 512/388-6886, $1995. The cheapest fast desktop Mac outdoes Apple's Power Mac 7500/120 in terms of price, and is near enough in speed. *Jul 96, p. 84*

★★★/5.9 **PowerCenter 120 Low Profile,** Power Computing, 512/388-6886, $1895. This system's low-profile case limits internal-drive expansion, and it doesn't really save space except maybe in a cubicle with low shelves, so go for the full-size PowerCenter desktops. *Jul 96, p. 84*

★★★★/7.1 **PowerCenter 132,** Power Computing, 512/388-6886, $2495. A little cheaper and a little slower than the PowerCenter 150; this is the desktop Mac to get if you want to shave some costs. *Jul 96, p. 84*

★★★★/7.3 **PowerCenter 150,** Power Computing, 512/388-6886, $2995. Until Apple puts more muscle in the Power Mac 7500, this is the best desktop choice—and it's inexpensive. *Jul 96, p. 84.* Editors' Choice for best business user's system.

★★/4.6 **Power Macintosh 7200/120,** Apple Computer, 408/996-1010, $2299. Apple should discontinue this line. It's not that cheap, and to upgrade it later to a 7600 will cost another $2000—way too much. *Jul 96, p. 84*

★★★/5.8 **Power Macintosh 7600/120,** Apple Computer, 408/996-1010, $2999. Apple's new flagship desktop Mac doesn't go far enough in performance. While the price hasn't changed, it's now outclassed by Power Computing's lineup. *Jul 96, p. 84*

★★★/5.8 **Power Macintosh 8500/132,** Apple Com-

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puter, 408/996-1010, $3899. For a moderate drop in performance, you can get a big price break on the 8500/120 versus the 8500/150, but it's still just for AV users. *Jul 96, p. 84*

★★★/6.0 **Power Macintosh 8500/150,** Apple Computer, 408/996-1010, $4699. AV professionals will continue to like the 8500, despite its hard-to-upgrade design and high price. *Jul 96, p. 84*

★★★/5.6 **Power Macintosh 9500/150,** Apple Computer, 408/996-1010, $4799. The real advantages of the pricey but fast 9500/150 are its six PCI slots. Otherwise, a PowerTower has better speed and a nicer price. *Jul 96, p. 84*

★★★/5.1 **PowerShop,** Adaptive Solutions, 503/690-1236, $2000 (estimated). Worth considering if its few accelerated tasks are among those you perform regularly. *Jun 96, p. 87*

★★★★/7.1 **PowerTower 166,** Power Computing, 512/388-6886, $3795. Comparable in performance to a Power Mac 8500/150, the PowerTower 166 is cheaper but lacks AV features. *Jul 96, p. 84*

★★★★/7.3 **PowerTower 180,** Power Computing, 512/388-6886, $4195. The top Mac performer, this tower also offers a good price and sufficient expansion for most people, but suffers from a hard-to-upgrade design. *Jul 96, p. 84.* **Editors' Choice** for best power user's system.

★★★★/8.1 **PR2-16828W,** ProMax Technology, 714/727-3977, $8890. Comparatively low price, can repartition with reconfiguring hardware. Has confusing installation guide for drives. *May 96, p. 57*

★★/4.2 **Psion Series 3a,** Psion, 508/371-0310, $595. PDA has good software features, but its awkward L-shape when open is unstable on uneven surfaces. *Jul 96, p. 102*

★★★/5.9 **Q1080,** APS Technologies, 816/483-1600, $350. 1.1GB drive is a slightly above-middle-of-the-road performer. *Jun 96, p. 153*

★★★/5.1 **SCSI PowerPlug II,** Hot Wire Technology, 203/761-0651, $119.99. A fast way to swap SCSI devices. *Feb 96, p. 86*

★★★/6.5 **SledgeHammer 3500FMF PCI II,** FWB, 415/325-4392, $5129. Software easy to use, but cables sometimes difficult to attach. *May 96, p. 57*

★★★/6.9 **SledgeHammer 7000FMF PCI II,** FWB, 415/325-4392, $9439. Fastest array tested, but cables sometimes difficult to attach. *May 96, p. 57*

★★★ **SledgeHammer8000FT,** FWB, 415/325-4392, $23,599. Level 5 RAID array provides constant access to your stored information. *Sep 95, p. 59*

★★★ **Sony Magic Link,** Sony, 800/571-7669, $699.95. Using this PDA is a breeze, but it lacks applications. *Aug 95, p. 62*

★★/4.5 **SSW-1800,** MicroNet Technology, 714/453-6100, $2185. 2.1GB drive is a slow performer all around. *Jun 96, p. 153*

★★★/5.8 **System 100,** Radius, 408/541-6100, $10,500. Radius bundles its mediocre digital-video cards on a relabeled Power Mac 8100—that's no wise investment. *Feb 96, p. 96*

★★★/6.5 **Taurus AV4221,** Micropolis, 818/709-3300, $1270. Stunning design, solid performance, and a five-year warranty make this 2GB drive shine. *Jun 96, p. 153*

★★/4.8 **Zaurus ZR-5000,** Sharp, 201/529-8200, $499. PDA is easy to carry and offers decent graphics tools, but little supporting software, and no handwriting recognition is available. *Jul 96, p. 102*

VIDEO/DISPLAY

★★/4.2 **AlphaScan GLX,** Sampo Technology, 770/449-6220, $1495. Low price fails to outweigh poor image quality. *Feb 96, p. 165*

★★★★/7.8 **ATI Xclaim GA,** ATI Technologies, 905/882-2600, $449. Offers adequate video-display acceleration and superfast FreeHand previews at a low price. *Jun 96, p. 93*

★★/3.3 **Datashow AV 4500,** Sayett Technology, 716/624-1290, $4875. Panel has inscrutable menus; lackluster video performance. *May 96, p. 139*

★★★/6.9 **Diamond Javelin Video 3400XL,** Diamond Multimedia, 408/325-7000, $569. Offers decent video acceleration and enhanced QuickTime display, but no control panel and a missing 832-by-624–pixel setting. *Jun 96, p. 93*

★★★/5.5 **Diamond Pro 21TX,** Mitsubishi Electronics America, 714/220-2500, $2199. Washed-out colors hold back an otherwise strong contender. *Feb 96, p. 165*

★★★★/7.5 **Eris 1.0,** RSI Systems, 612/896-3020, $3995. Dedicated box is easy to install, but the system is expensive and you need to supply your own camera. *May 96, p. 82.* **Editors' Choice** for best desktop videoconferencing system.

★★/4.4 **FlexScan F2 21,** Nanao, 310/325-5202, $2299. Blurry, dim image and too high a price. *Feb 96, p. 165*

★★★/6.8 **IMS TwinTurbo-128M,** Integrated Micro Solutions, 408/369-8282, $699. Slight screen-refresh artifacts and image shifts when changing bit depth detract from good video acceleration speeds. *Jun 96, p. 93*

★★★/6.8 **Kodak Digital Science DC50 Zoom Camera,** Eastman Kodak, 716/724-4000, $1000. Camera combines zoom and autofocus with good color and detail. *Jul 96, p. 57*

★★★★/7.1 **MagnaByte M3xv,** Telex, 612/884-4051, $3995. Easy to use, good image quality, mid-range price. *May 96, p. 139.* **Editors' Choice** for best LCD projection panels.

★★★/5.2 **MagniView 488B,** Dukane Audiovisual Products, 708/584-2300, $4995. Image quality is a notch below average in all categories. *May 96, p. 139*

★/2.8 **Matrox MGA Millennium,** Matrox, 514/969-6320, $649. Video-display acceleration is disabled when floating palettes overlap document windows—a major flaw. FreeHand preview performance isn't great, either. *Jun 96, p. 93*

★★★/6.8 **Meet-Me 1.0,** Sat Sagem, 408/446-8690, $2995. Good audio and video, but more expensive than the Apple system it's based on. *May 96, p. 82*

★★/4.8 **Multigraph 445X,** Nokia Display Products, 415/943-4071, $2775. Adequate image quality, but at too high a price. *Feb 96, p. 165*

★★★/6.2 **Multiple Scan 20 Display,** Apple Computer, 408/996-1010, $2149. Not as vibrant as it could be, but good value. *Feb 96, p. 165*

★★★/5.9 **MultiscanTC,** Sony, 408/432-0190, $3950. Special color-adjustment tools don't overcome mediocre performance. *Feb 96, p. 165*

★★★/6.8 **MultiSync M500,** NEC, 508/264-8000, $599. Multimedia monitor has a top-notch picture and decent sound. *Jul 96, p. 69*

★★★★/7.3 **MultiSync XE21,** NEC Technologies, 508/264-8000, $1899. Rich, bright images complemented by excellent controls. *Feb 96, p. 165*

★★★/5.8 **MultiView 21,** Radius, 408/541-5700, $2149. Seductively rich colors, but too soft a focus. *Feb 96, p. 165*

★★★★/8.3 **Number Nine Imagine 128,** Number

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Nine Visual Technology, 617/674-0809, $999. The fastest overall video acceleration of the PCI cards we reviewed, plus support for 1600-by-1200 resolution, but at a relatively high cost. *Jun 96, p. 93*

★★★/5.0 **Ovation 810,** Proxima, 619/457-5500, $3295. A better value than Proxima's high-end Ovation 846C panel. *May 96, p. 139*

★★/4.7 **Ovation 846C,** Proxima, 619/457-5500, $5995. Design and features outshine image quality of this projection panel. *May 96, p. 139*

★★★/5.0 **PanaSync/Pro C2192P,** Panasonic Communications & Systems, 201/348-7000, $1999. Reasonable price fails to overcome weak image quality. *Feb 96, p. 165*

★★★/6.6 **Pivot 1700,** Portrait Display Labs, 510/227-2700, $1099. Good image quality but doesn't automatically switch views when rotated. *Mar 96, p. 70*

★★★/5.4 **Polaview 3000,** Polaroid Electronic Imaging Systems, 617/386-2000, $5295. Unremarkable overall image quality; above-average video. *May 96, p. 139*

★★/3.5 **PowerView 950V,** In Focus Systems, 503/685-8888, $9499. Innovative concepts but substandard image quality; overpriced. *May 96, p. 139*

★★★★/8.6 **PressView 21 SR,** Radius, 408/541-6100, $3999. The best professional-quality display gets better. *Feb 96, p. 62*

★★/4.3 **ProColor 1701,** Boxlight, 360/779-7901, $6499. Panel has substandard image quality and hard-to-use controls. *May 96, p. 139*

★★★/5.0 **QuickDraw 3D Accelerator Card,** Apple Computer, 408/996-1010, $400. Supports texture maps but only minor speed gains with major 3-D applications. *Apr 96, p. 60*

★★★ **QuickTake 150,** Apple Computer, 408/996-1010, $739. Digital camera is easy to use and includes close-up lens. *Jan 96, p. 59*

★★★★/7.1 **QuickTime Conferencing Kit 1.0,** Apple Computer, 408/996-1010, $2000. Good value, straightforward LAN- and ISDN-capable software, but no digitizer included and ISDN setup is complex. *May 96, p. 82*

★★ **Radius Telecast,** Radius, 408/541-6100, $9995. QuickTime-based video editor has potential, but software is not yet mature. *Jan 96, p. 65*

★★/3.5 **Radius Thunder 30/1600,** Radius, 408/541-6100, $1499. An incompatibility with FreeHand causes preview speeds to plummet, but otherwise this PCI video-display card offers solid performance and a nice control panel. *Jun 96, p. 93*

★★★★/7.2 **Rainbow 30/10,** Chisholm, 408/559-1111, $4995. Panel is carefully designed for ease of use; a good value. *May 96, p. 139.* Editors' Choice for best LCD projection panels.

★★★★/7.3 **RasterOps SuperScan Mc 21,** NSA/Hitachi, 617/461-8300, $2299. Top performance plus sensible, intuitive controls create a winning combination. *Feb 96, p. 165.* Editors' Choice for best two-page monitor.

★★★/6.5 **ShareVision Mac3000 1.0,** Creative Labs, 408/428-6600, $1149. Easy to install with good sound quality, but small maximum frame size and poor synchronization are problems. *May 96, p. 82*

★★/4.0 **Sharp QA-2500,** Sharp, 201/529-8731, $9995. Panel offers overly complex image controls; expensive. *May 96, p. 139*

★★★/5.5 **SmartView 3600,** In Focus Systems, 503/685-8888, $3799. A solid LCD performer and a good value. *May 96, p. 139*

★★/4.1 **SyncMaster 20GLs,** Samsung Electronics America, 201/691-6200, $1599. Glare-catching, image-distorting tube and weak controls. *Feb 96, p. 165*

★★★/5.8 **ViewSonic 21PS,** ViewSonic, 909/869-7976, $2095. Bright, vibrant, though not particularly sharp image. *Feb 96, p. 165*

★★★/5.9 **Vision Q3 LCD Panel,** Apollo Presentation Products, 516/467-8033, $6750. Top image quality but difficult to use. *May 96, p. 139*

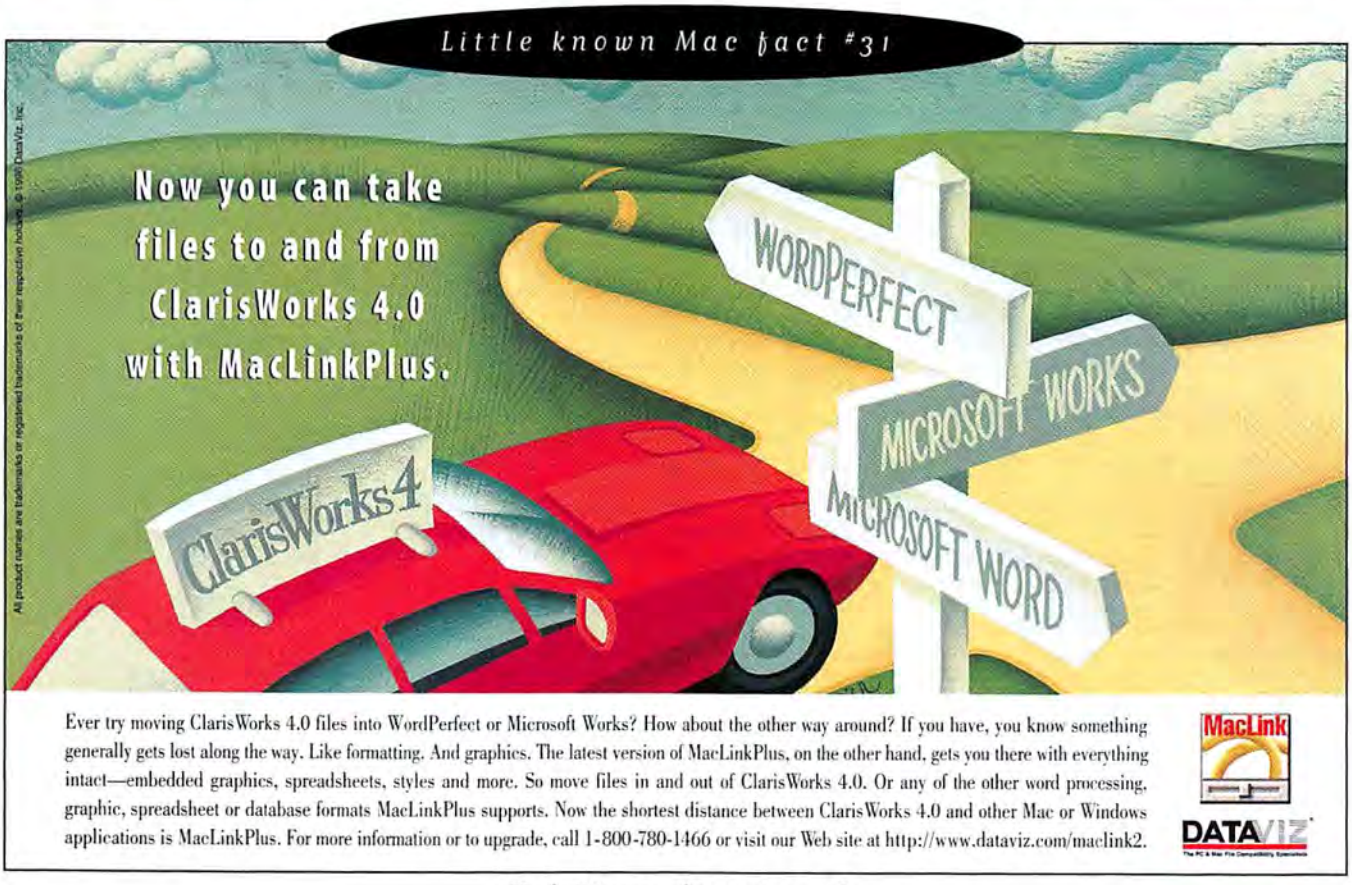
★★★/5.3 **VisionMaster Pro 21,** Iiyama North America, 215/957-6543, $1995. Good image quality, but confusing controls. *Feb 96, p. 165*

★★★/5.2 **Visit Video 2.0 (2.1),** Northern Telecom, 214/684-1000, $2999. Good call management and supplies all hardware, but lacks H.320 support and has small on-screen frame size. *May 96, p. 82*

★★★/5.0 **VR-1000 3-D Stereoscopic LCD Projection Panel,** VRex, 914/345-8877, $6995. The only choice for projecting 3-D images, though stereo 3-D images don't integrate well with standard PowerPoint or Persuasion slide shows. *May 96, p. 139*

★/1.9 **Yarc Screamer,** Yarc Systems, 805/499-9444, $995. Supports texture maps but slower than using no board in some instances; chokes on simple models. *Apr 96, p. 60*

★★★/5.6 **Z215,** nView, 804/873-1354, $5695. Good image quality, very sleek and compact. *May 96, p. 139* m



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Printers	○	○
Storage Devices	○	○
Networking/Data Communications	○	○
Internet/Intranet products/services	○	○
Software: business/productivity	○	○
graphics/design	○	○
interactive publishing/ multimedia	○	○
entertainment	○	○
education	○	○
other software	○	○
Any other products	○	○

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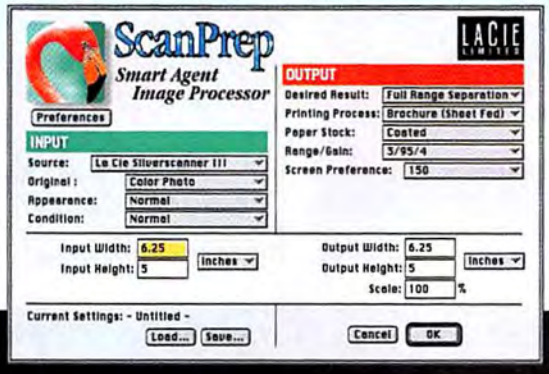

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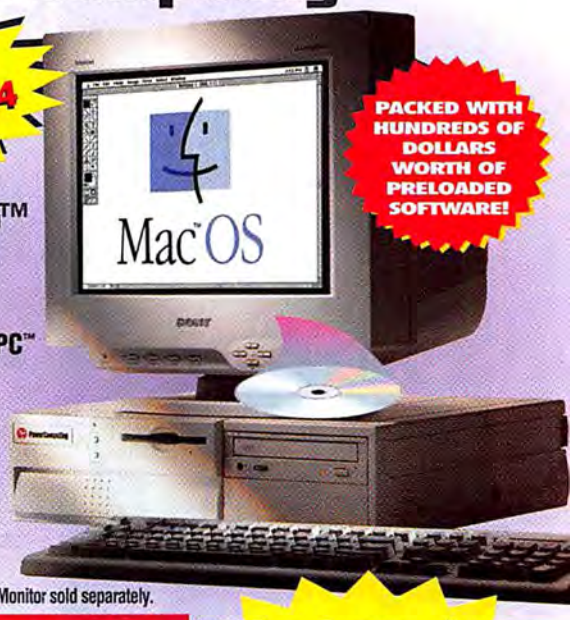

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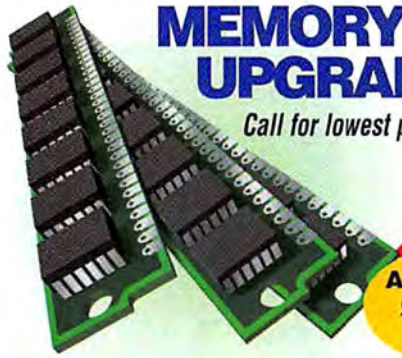

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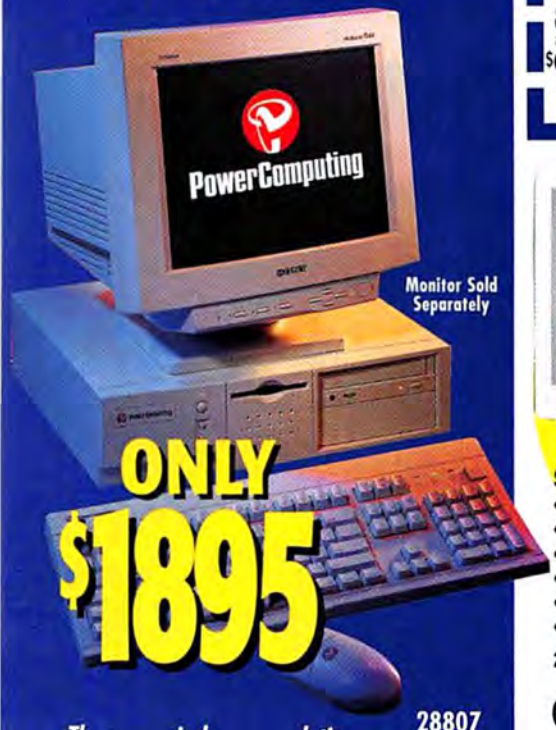

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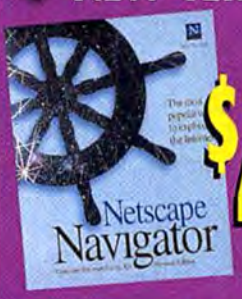

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APS HyperQIC™ Travan 4 Conner QIC 3095 Mech.	8GB ◆◆◆◆ MacWEEK LABS	N/A	$499.95
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- Listed capacities are formatted
- Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.
- Prices and specifications are subject to change without notice.
- All hard drives from APS Technologies come preformatted with Apple's System 7.0.1 software, and APS Technologies' APS PowerTools SCSI formatter/hard disk partitioner. You may need to install system software appropriate to your machine before use.
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Model	Internal	SR2000
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APS CD-R Recordable CD-ROM	N/A	599.95
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Model	Capacity/Awards	Internal	SR2000
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APS MS 4.0 Micropolis 3243	4064MB	899.95	999.95
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APS MS 9.0 Micropolis 1991	8669MB	1899.95	2099.95
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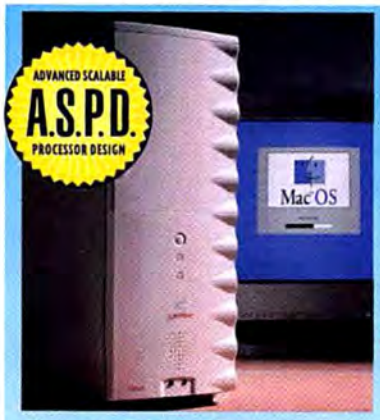

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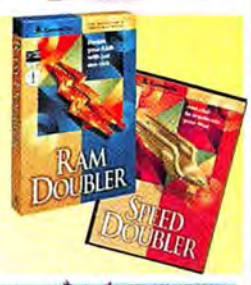

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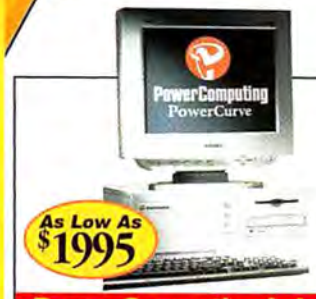

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06865	Supra FaxModem 144PB Int - PowerBook	$155.98
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91807	TDK 28.8 PCMCIA Fax/Modem for Apple 5xx	$259.98

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93701	Mac & Fax Sportster 14.4	$79.98
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14359	DG120M 4mm Data Cart (4GB)	$24.98
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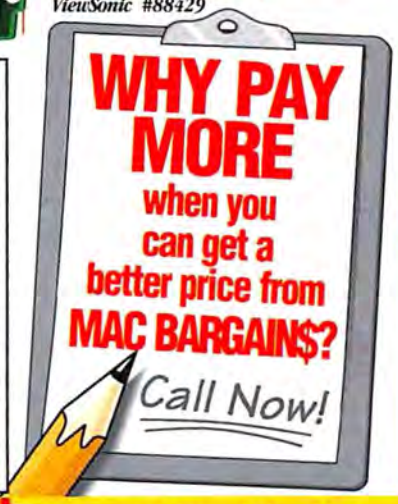

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A055 1001 Agfa Arcus II Desktop Professional Scanner $1995
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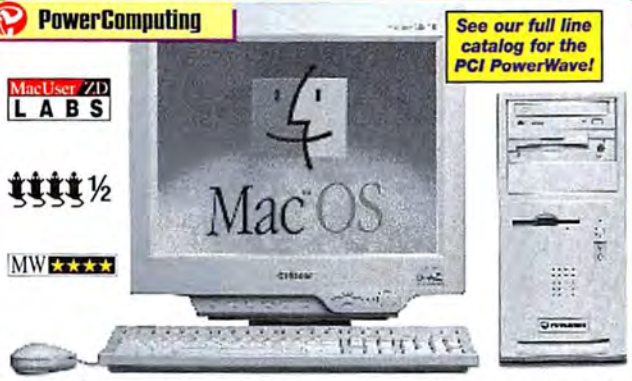

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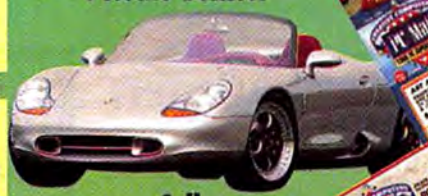

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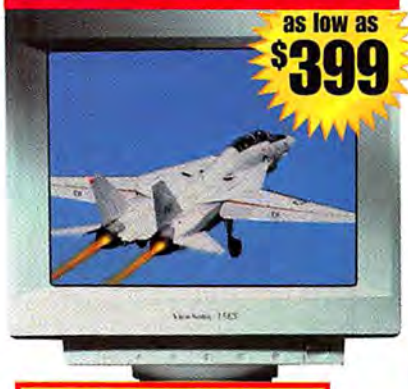

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4mm 120M	[DAT120M]	$27	$22	$20
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230MB	[OP230]	$21	$17	$15
650MB 512K	[VBR5B2]	$51	$47	$45
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200MB	[SQ2000]	$72	$68	$66
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2 Gig	7200rpm	$529	$589
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1080MB	11ms	5400	Seagate	ST51080N	3	$255	$315
1280MB	12ms	5400	Quantum	FB1280S	3	$265	$325
2050MB	8.5ms	7200	Micropolis	MC4221	5	$545	$605
2050MB	8.5ms	7200	Micropolis	MC4221AV	5	$605	$665
2147MB	9ms	5400	Micropolis	MC4421	5	$469	$529
2147MB	9ms	5400	Seagate	ST32155N	5	$555	$615
2147MB	8ms	7200	Seagate	ST32550N	5	$675	$735
2150MB	8ms	7200	Quantum	XP32150	5	$635	$695
4290MB	8ms	7200	Seagate	ST15150N	5	$999	$1059
4294MB	8.9ms	7200	Micropolis	MC3243	5	$859	$919
4294MB	8.9ms	7200	Micropolis	MC3243AV	5	$949	$1009
4300MB	8.6ms	7200	Quantum	XP34300	5	$889	$949
9091MB	12ms	5400	Micropolis	MC1991	5	$1749	$1849
9091MB	12ms	5400	Micropolis	MC1991AV	5	$1865	$1965
9080MB	11ms	5400	Seagate	ST410800N	5	$1889	$1989
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2050MB	8.9ms	7200	Micropolis	MC4221WAV	5	$690	$800
2147MB	8ms	7200	Seagate	ST32550W	5	$745	$855
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4294MB	8.9ms	7200	Micropolis	MC3243W	5	$949	$1059
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4300MB	8.6ms	7200	Quantum	XP34300W	5	$955	$1065
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1280MB	12ms	5400	Quantum	FB1280A	3	$225
1700MB	11ms	4500	Quantum	SR31700A	3	$249
2167MB	10ms	5400	Seagate	ST32140A	3	$309
2500MB	11ms	4500	Quantum	SR32550A	3	$359
2 1/2"						
540MB	13ms	4200	Toshiba	MK1924FC	1	$309
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2-4Gig	Seagate	DAT	$789
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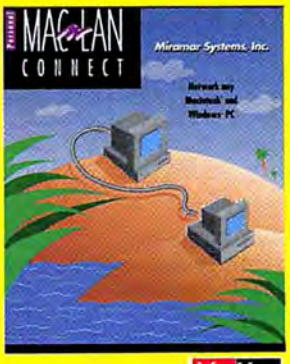

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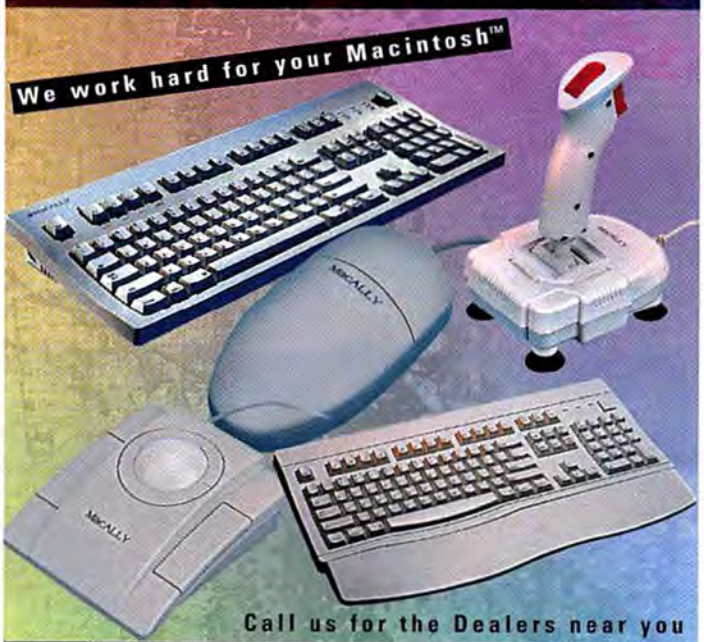

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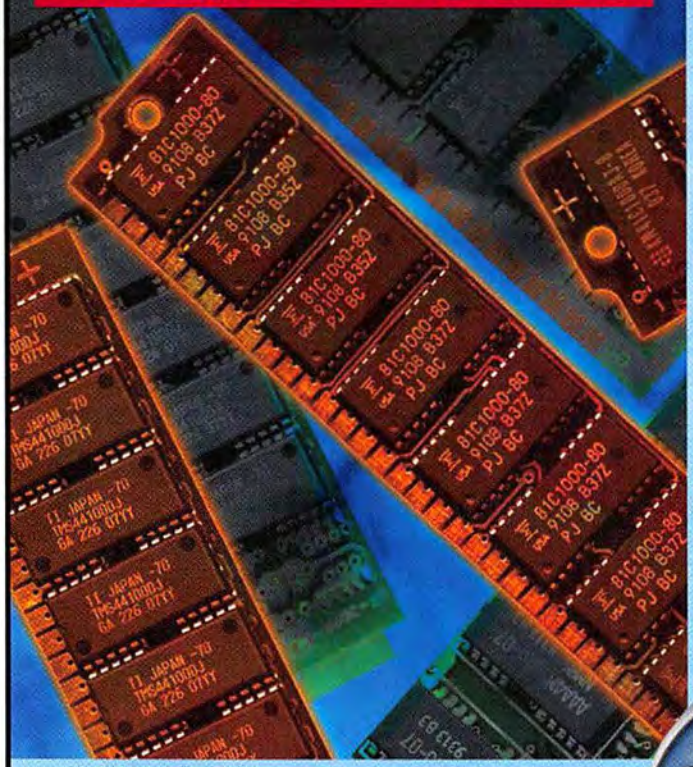

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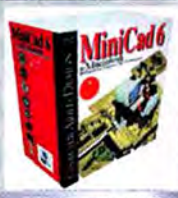

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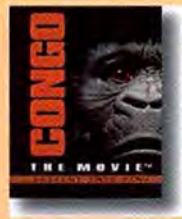

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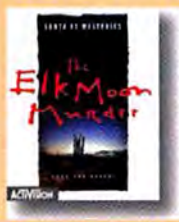

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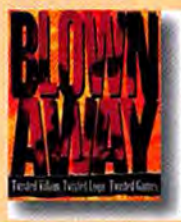

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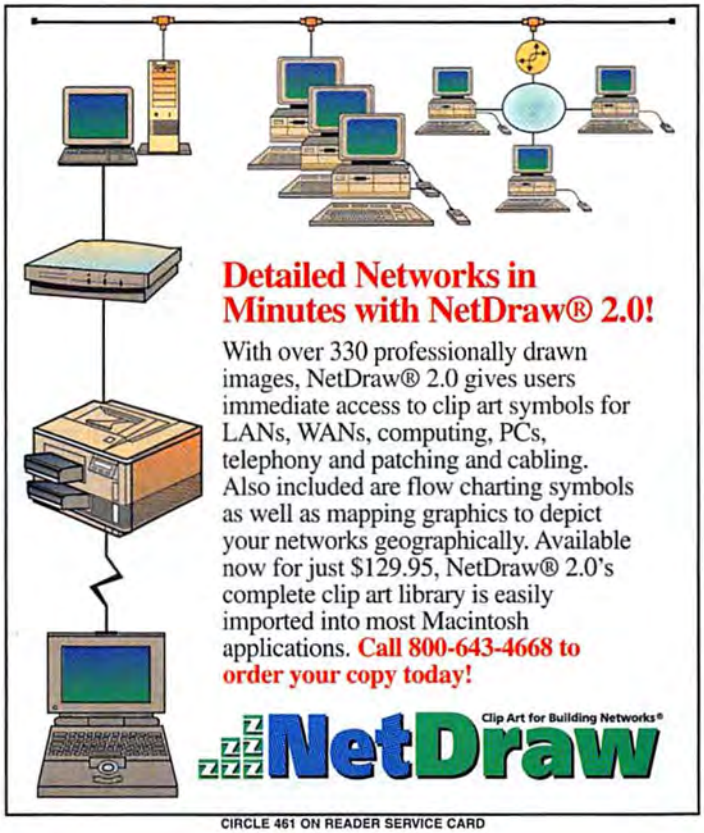

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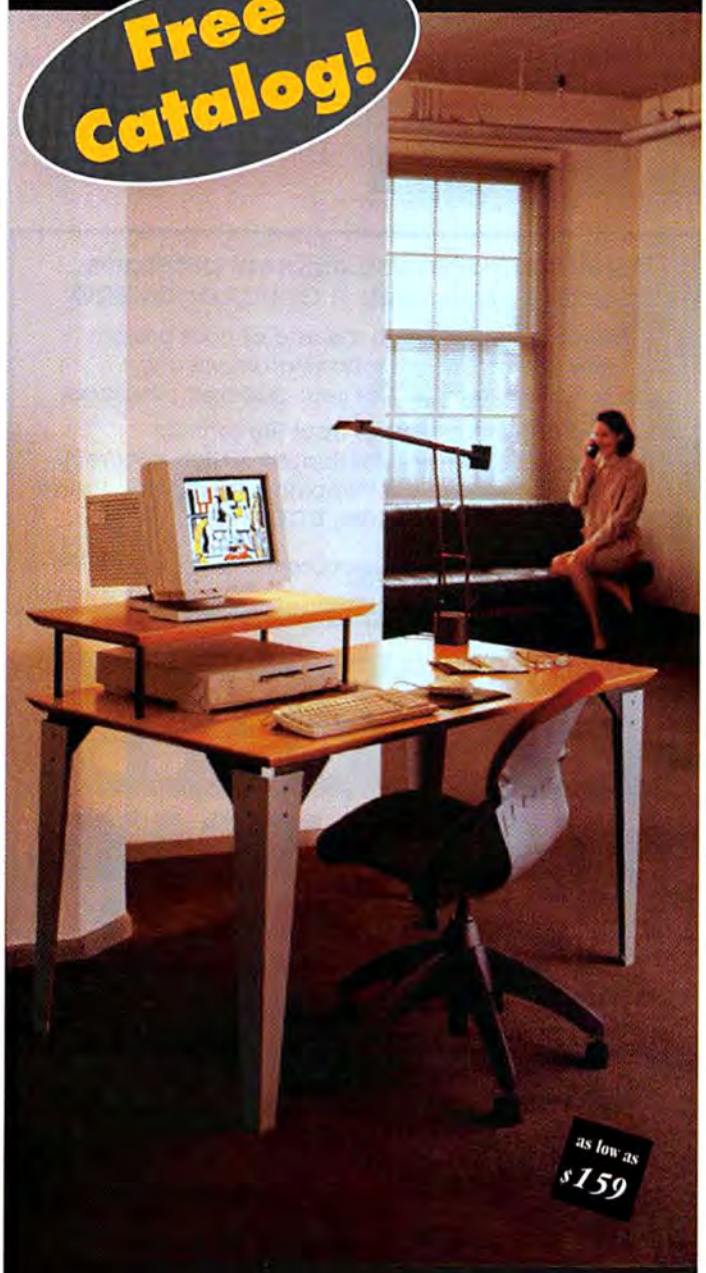

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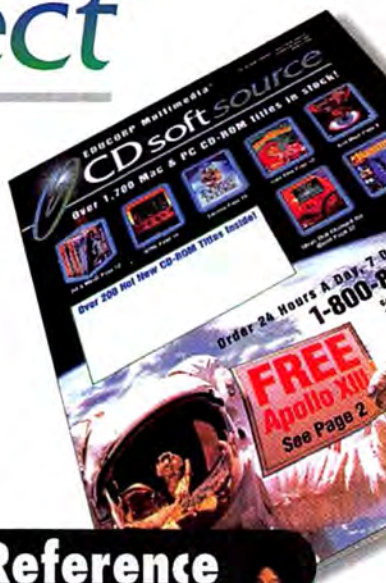

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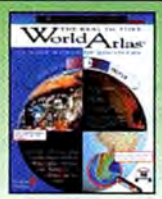

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by Spike Gillespie

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DISCOVERING MY HUSBAND'S NET WORTH, SIGHT UNSEEN

ON OUR SECOND DATE, Dave and I stood atop the Hills Brothers Coffee building at the edge of San Francisco, in a sea of people celebrating Ikonic, a new Web community that hopes to use the Internet to bring people together, face-to-face, to work on local community problems. We chatted up our fellow attendees, took in a breathtaking view of the Bay, and snuck off once or twice to make out like giddy teenagers (which we decidedly are not). It had been not quite 4 weeks since our first in-person date, 9 weeks since we'd met online, and 25 days since we'd last seen each other—on our wedding night.

Some of our friends were surprised that on the day after we'd married we were again two time zones apart and in most ways back to our former lives—Dave on the West Coast working in computer-industry PR, and me posting my weekly column to Prodigy's list server and raising my son, Henry, here in Austin, Texas. What really startled people, though, was our decision to marry without a longer in-person courtship.

Proceed with Caution

Ordinarily, I'd have agreed. But nine virtual weeks of constant words and thoughts can, I discovered, offer far more insight than nine weeks of phone tag and dinner dates and mascara and lingerie.

Initially, he'd sent a brief fan note. I responded with a brief thank-you. Later, a note arrived from Women's Wire editor Laurie Kretchmar, whom I had profiled. She had told Dave, whom she knew professionally, about my column. Laurie informed me that Dave was, based on my writing, very interested in me.

This was not the first time I'd been offered a shot at Net romance, and I had a rule: Before I got involved electronically, there had to be a mutual friend, an introduction—some indicator that the man in question was not psycho. Laurie's note opened a door: I wrote Dave again.

We progressed to phone calls and photos, but the E-mails were my favorite part. Never sex-laden, they afforded deep confession, passionate catharsis, and insight into our beliefs, our mistakes, and where we had been and hoped to go. We seemed to have more in common than we'd had with our respective strings of exes. I thought, "If this man is just 75 percent in person who he is electronically, I want to spend my life with him." He'd already told me that he felt likewise.

That's what I like about E-mail. If two people can be totally honest, you can cover a lot of ground fast. Relying solely

on words for several weeks, we weren't distracted by other forces, like mistaking physical passion for actual love. Yes, this meant laundry lists of what each did and did not want in a relationship. But Dave's messages conveyed a perceptible tone and aura—qualities said to be imperceptible online—that caught me and held me.

On the other hand, I am not stupid. While I didn't like to think Dave was misrepresenting himself, I couldn't rule it out. I told him I planned to check him out—and again, the Net expedited the process. Our lives had crisscrossed professionally for years, so we had more than a few mutual colleagues. I asked around. Siskel and Ebert could not have given a better recommendation if they had eight thumbs. Even so, I am a firm believer in chemistry. I asked Dave to fly here, to reveal his physical being. If we clicked, I told him, I would marry him immediately.

We did click—at the luggage carousel of the airport. And so I did marry him, on top of the highest peak in Austin, three days after his arrival, without a monitor, modem, or laptop in sight.

Tell 'Em We Met at the Office

Dave's dad, Dave Sr., phoned to congratulate us after the event. While our apparent haste baffled others, Dave Sr. was more puzzled by our method of courtship. He had actually helped mold the Internet in Cambridge, Massachusetts, in the late fifties and sixties, and was used to thinking of it as primarily a medium for sharing scientific research. "You fell in love on the Internet? In my day there *were* no women on the Net."

The Internet has come a long way, I reminded him. It's still about exchanging information, but the amount and type of information exchanged falls into a much broader realm. Sometimes, as in our case, a more personal realm. For us, the Internet wasn't about singles-bar–style chat rooms or desperately seeking virtually what we could not find in real life. (In our jobs, the Internet *is* real life.)

"Think of ours as an office romance," I told him. "In a way, Dave and I share a huge workspace. And we're not the first couple who had the good fortune to meet in the company mailroom."

As far as we can tell, though, we are the happiest. **m**

SPIKE GILLESPIE (*http://www.marystreet.com/SPIKE*) lives with her son, Henry, in Austin, Texas, where she writes a listserv and an online advice column. Her work has also appeared online in Salon and Word, and in print in *Texas Monthly*, *Cosmopolitan*, *GQ*, *Playboy*, *Elle*, and *Mademoiselle*.

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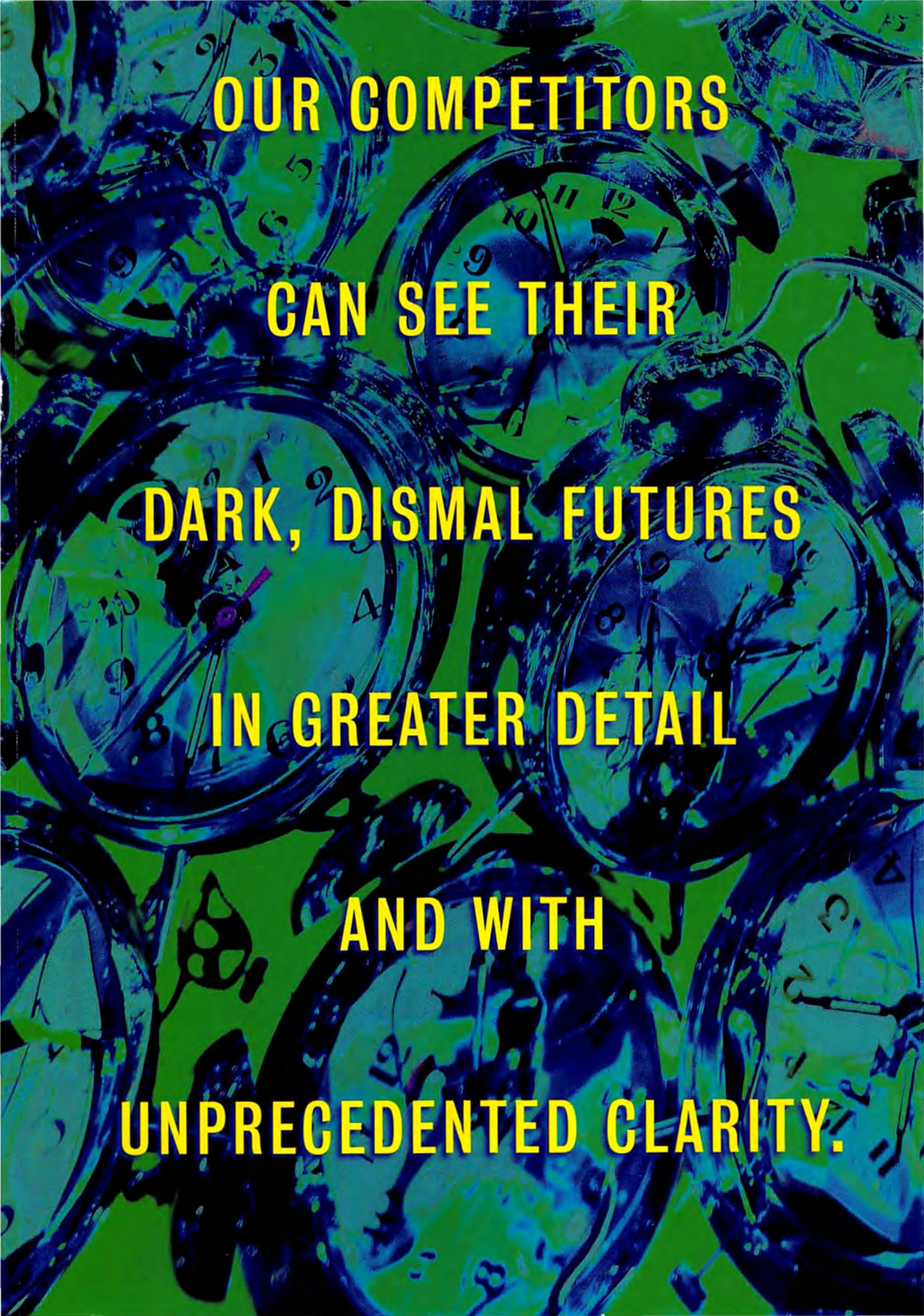
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