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OCTOBER 1996

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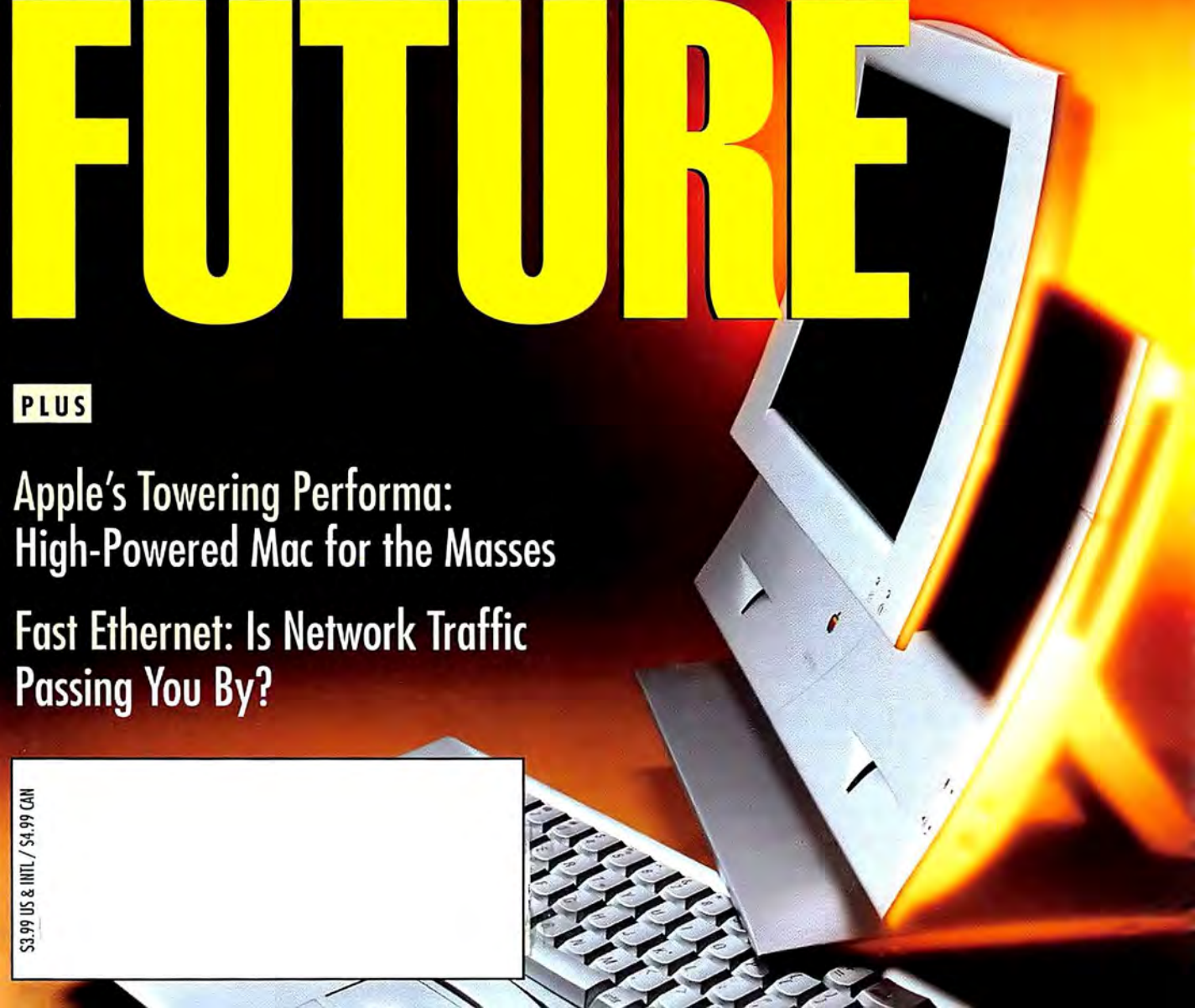

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Word 6.0.1a Update If you are still running Word 6.0 you will definitely want to upgrade your software to this much improved version. Word 6.0.1a, introduced last fall, enhances performance and stability, speeds up your boot time and word counts, improves font handling and much, much more.

System 7.5 Update 2.0 from Apple Computer. Now you can get the most from your Mac with Apple's free update for System 7.5 users. This update will improve overall stability and performance and, if you use Virtual Memory on your PowerMac,* start your applications up to four times faster than before.

Now you can download Microsoft's Internet Tools and discover the new Internet capabilities of your Mac. Free.* Microsoft's continued commitment to the Mac means you'll be browsing, creating, and accomplishing more than ever before. To obtain your Internet Tools, and

the System 7.5 Update 2.0, please visit **//www.microsoft.com/macoffice/**. Or to order a free Microsoft Empowerment Pack for the Mac, which includes a CD-ROM with the software listed above plus a special offer on RAM from Kingston Technology, call 800-469-6520 Dept. MCA. Come see us at the Macworld Expo Boston, booth #5434.

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OCTOBER 1996 / VOLUME 12 NUMBER 10

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Cover photo / Adrian Ordenana

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LOOKING INTO APPLE'S FUTURE

Despite a wretched year, there is reason to be optimistic about Apple. Here's the inside story on what Apple is working on in order to regain its competitive edge.

Come with us as we take you behind the scenes and show you what tomorrow's Macs will bring. Hear the inside scoop on Apple's system-software strategy, the company's Internet plans, and the big part 3-D will play in the future of the Mac. Take a look at what's up with the Information Appliances Division, and more.
By Henry Bortman and the MacUser staff / 66

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Did you think Performas were low-end? Well, think again. Apple's Performa 6400 outperforms all but the latest and most expensive Power Macs, thanks to its PowerPC 603e processor, which runs at a blazing 180 or 200 MHz. And it's Apple's most expandable consumer offering to date.
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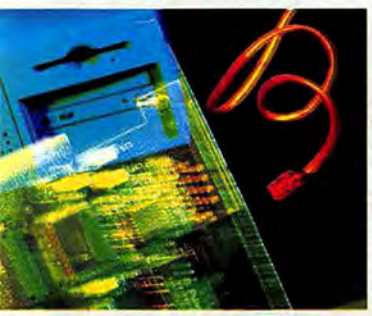

Not So Fast Ethernet

First it was 10BASE-T. Now it's 100BASE-T, also known as Fast Ethernet. But is it really ten times as fast? MacUser Labs puts ten NuBus and PCI Fast Ethernet cards from six vendors to the test — with some interesting results.
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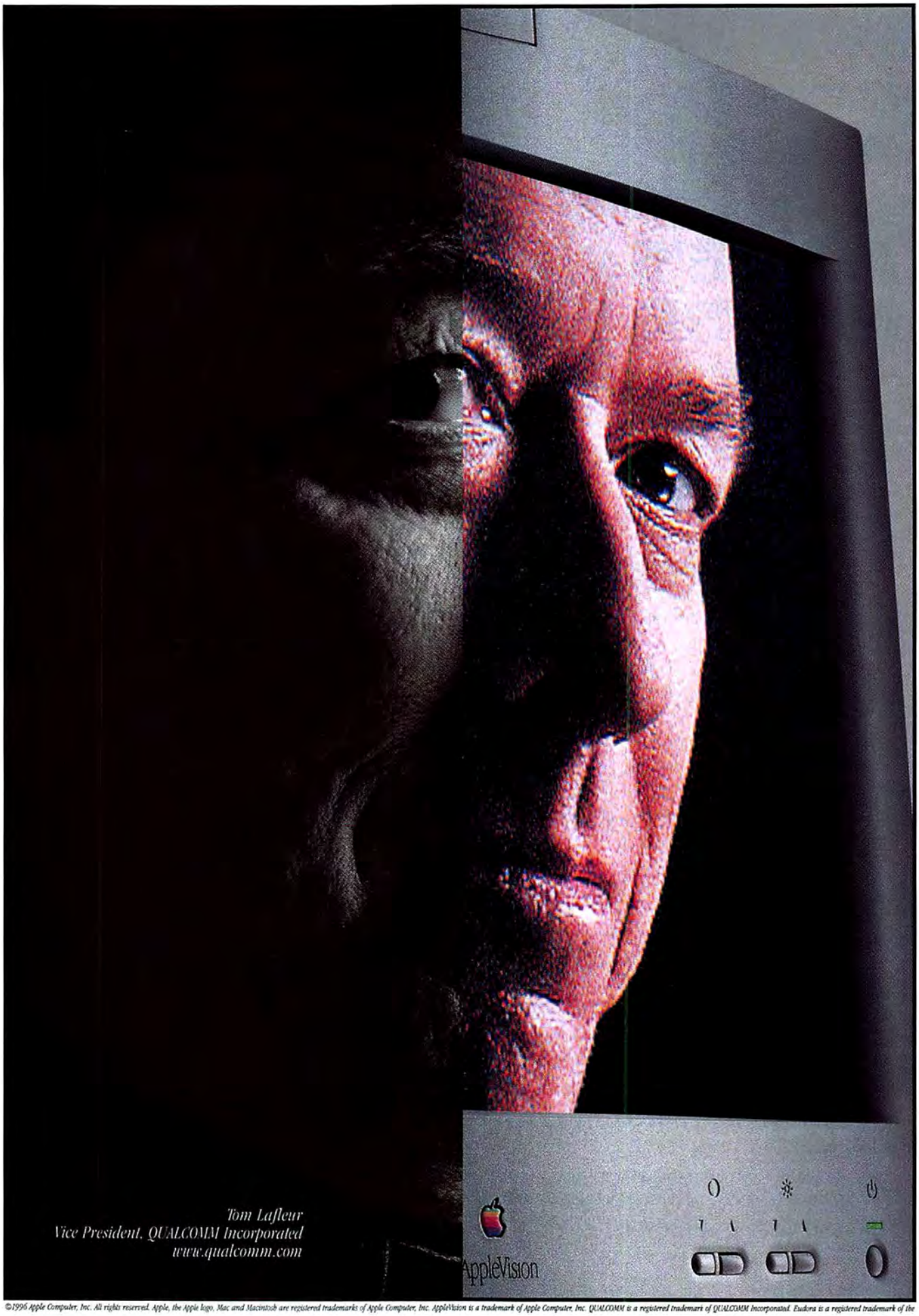

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DYE SUBLIMATION PRINTERS

If you're a professional desktop publisher or graphic designer and in the market for a dye sublimation printer for color proofing, be sure to pick up the December issue of MacUser. MacUser editor Roman Loyola will review eight dye sub printers all priced under $20,000. Each will be mouse-rated based upon image quality, speed and price. MacUser will recommend the best printer making buying safer — and easier.

CD-ROM TITLES

In the December issue, MacUser sorts through the sea of CD-ROM titles and picks the top 50 in categories such as history, reference, games, children's, and music. With a focus on titles shipping in 1996, MacUser mouse-rates each one evaluating content, design and interactivity. If you're asking "what's in a title?," you'll find the answer in MacUser.

17" MONITORS

This December , Jeff Pittelkau, MacUser's own monitor expert, will round up all shipping 17" monitors and pick the best of the bunch. For those of you interested in purchasing a 17" monitor , Pittelkau shares some shopping advice like being prepared with the right questions to ask. MacUser views the monitor market to help readers make the right buying decision, month after month.

DECEMBER AD CLOSE:
TUESDAY
SEPTEMBER 17, 1996

MacUser

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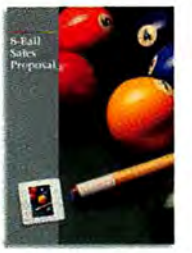

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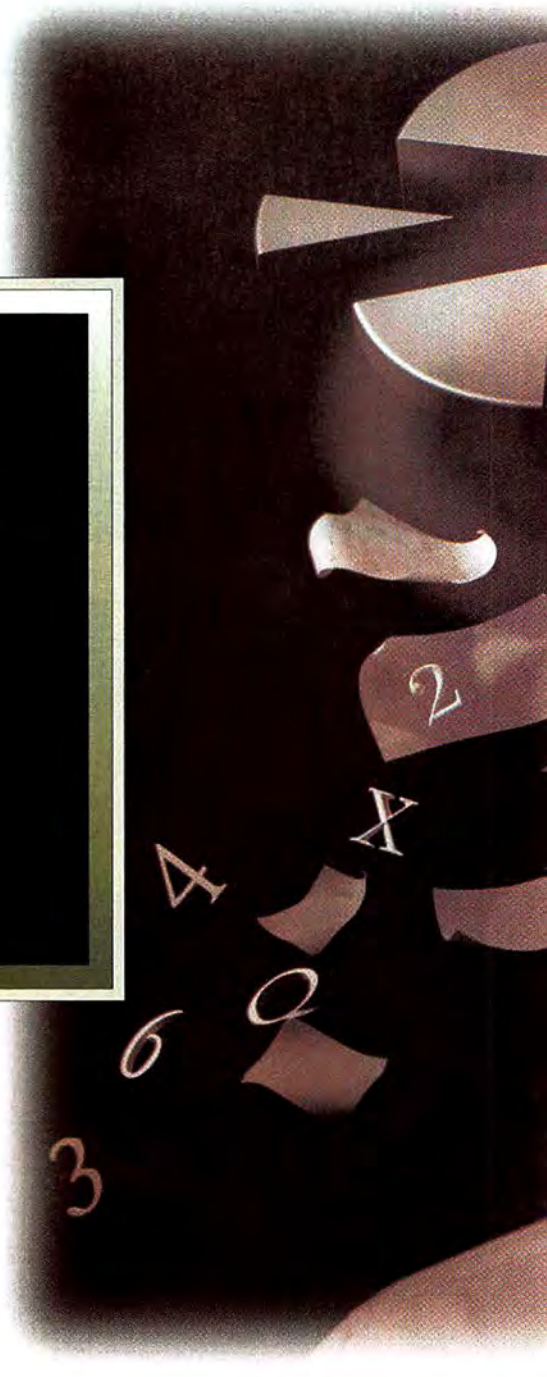

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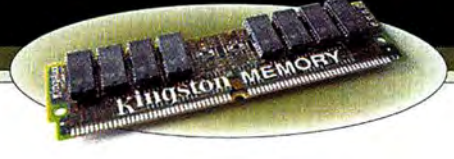

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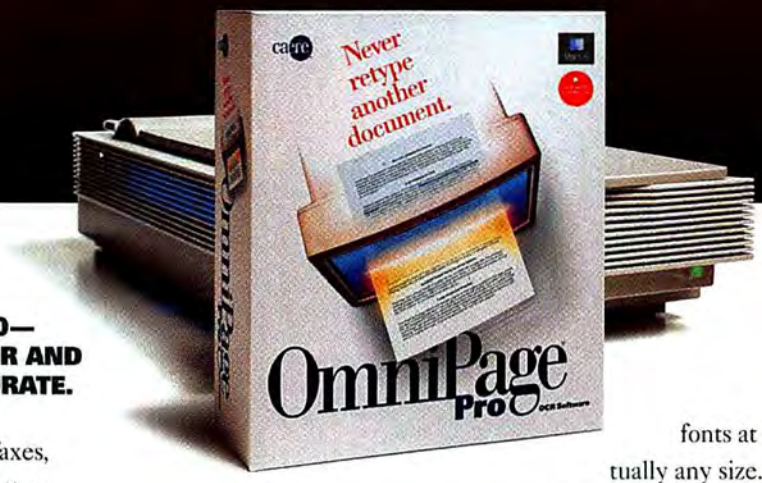

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LETTERS

Web War Rages On

SHAME ON YOU for "Web War" (July '96, page 62). What was an informative and balanced article about the leading browsers transformed into a stomach turner in the last paragraph. To actually endorse a Microsoft product in the current climate is horrifying. Remember who the innovator was in 1984? Remember who blatantly stole the concept and corrupted it into Windoze? Now a new upstart, Netscape Communications, has given the world a better browser. And who comes along late to the party again, mysteriously leapfrogging many other also-rans? I, for one, will never run a Microsoft browser on my Macintosh. Just because Windoze 95 has some features that the current Mac OS doesn't, are you next going to advise us to jump ship and buy a PC clone?

Jonathan Marut
jkmarut@worldnet.att.net

I MUST ADMIT, when I read your review favoring Microsoft's browser over Netscape's, my thoughts about your point of view were distinctly uncomplimentary.

Then Netscape started to crash frequently, despite a reinstallation, a new version (2.02), and a 10-MB memory partition. So I reluctantly tried out the Microsoft package, and whaddaya know — it works and is comparatively stable. And it looks clean.

Although I'm not enamored of Microsoft, I do feel that we users should support the best, most elegant, fastest, least bloated and yet reasonably capable software that suits each particular purpose. Right now, I'd have to agree with your conclusion. I realize that rather than being a Microsoft toady, you were sticking your neck out by being honest. So I hope this letter makes up for some of the flames you have doubtless received from other people.

Chuan Chew
via the Internet

I JUST finished reading "Web War." Your review was so positive, I decided to download Internet Explorer. I, however, did not find Microsoft's product to be even close to Navigator 2.01 in features and functionality. In fact, I found Internet Explorer to be a poor imitation of Navigator.

Although I agree with your argument that neither application is a software end-all to utilizing the Web, Internet Explorer's inability to receive e-mail, its lack of JavaScript support, and its poorly designed interface all place it quite a bit further away from satisfying users' needs than Navigator 2.01.

Howard E. Sander, III
howardes@gvi.net

HURRAY FOR JOURNALISTIC integrity. Everyone hates Microsoft because of the clunky ports it has foisted on the Mac market and because the lousy Windows 95 threatens the very existence of the Mac.

However, Internet Explorer is the better browser, because of its speed, which is the key to pleasurable surfing.

Thanks for the straight dope.

Daniel Z. Lieberman
via the Internet

Cyberdog Tales

AFTER READING "Walking the Cyberdog" (July '96, page 69), I've been clued into some new avenues. I recently dragged an address from the Notebook onto the desktop, and *voilà* — a Web file appeared. Double-click on it, and the browser simply opens to the site requested. This product is *more* stable than Netscape Navigator and Microsoft's Internet Explorer.

WRITE TO LETTERS

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Open Folder

Although alleged Unabomber Ted Kaczynski may never see any royalties for his epistolary efforts, the manifesto remains a popular literary genre among budding recidivists. One typical day in our San Francisco Bay Area offices — where the worlds of high technology and high intrigue often collide — the following note appeared, penned by a young rapscallion whose alias is *Matt Spiro:* "I'm a hacker. This is my manifesto. I'm 12 years of age; from New York. My only crime is of curiosity and comedy, yet my friends and I are persecuted by all computer users, who fear and hate us. Yet none of these people know me at all. If you do not taunt or tease us, we won't hurt you. All I'm saying is that before you give me and my friends a bad rap, think about it. You should respect our overwhelming knowledge, not hate it." Crime doesn't pay, "Matt." Put the mouse down, and walk away.

On another hot, dry, morally cloudy California afternoon, another unrepentant young hacker — known only as *Das1899* — laid this heavy trip on us: "I read your [*April*] report on FoolProof Security and scoffed. Me and my 12- and 13-year-old buddies opened it five minutes after the bell rang at our junior high on the first day." Listen good, bub: You and the rest of the 1899 Gang are going to land yourselves in the homeroom at the hoosegow if you don't straighten up and fly right. *Capisce?*

Later, as our investigators were filing reports on the latest case of cross-platform incompatibility (such cases are our bread and butter), this plea came in over the wire from Scott Hutchinson: "I was browsing a copy of my system folder with ResEdit and came across this peculiar string: 'How razorback-jumping frogs can level six piqued gymnasts!' What kind of error must I commit in order to get this message?" Sam Spade had the Maltese Falcon. Agent Cooper had the owls that weren't what they seemed. We get razorback-jumping frogs. This job ain't what it used to be.

ILLUSTRATION / MARGARET MCMULLIN

Articles such as this are needed so that the general Mac audience can get an idea of what real desktop integration and user productivity are all about.

Paul White
paulw@shc1.story-house.com

I JUST FINISHED READING "Walking the Cyberdog," and I think you missed one important problem with Cyberdog: It is S-L-O-W. I got a release version from Apple and installed it at once on my Power Mac. It was exceptionally stable (a welcome relief from Navigator 2.02, Internet Explorer 2.0, and Mosaic PPC), but I found it too slow to use. For example, a Web page that took 10 seconds to call up with Navigator and Internet Explorer took more than a minute with Cyberdog. Even worse was the e-mail. In the time Cyberdog takes to download my typical 300 messages (daily), I can take a shower, eat breakfast, and still download the same number of messages with Claris Emailer or Eudora. Even worse, I can delete 50 to 60 messages in Claris Emailer in the time it takes to delete *one* in Cyberdog.

Since it is currently by far the slowest method of connecting to the Internet, I would not recommend Cyberdog to anyone.

Russell Kurtz
russtms@earthlink.net

I KNOW IT WAS STILL in beta when the article first came out, but you could have given Cyberdog the nod in "The Also-Rans" ("Web War," July '96, page 65). I use it almost exclusively these days because of its ease of use and "clean" style. Hopefully it will develop into not only an OpenDoc showcase but also a full-fledged browser.

Christopher Fohl
taibhse@csd.uwm.edu

Power Differential

IN "POWER TAKES THE LEAD" (July '96, page 75), you say that Apple's Power Mac 7600/120 is only $450 more than Power Computing's PowerCenter 120. If that were the only difference, I would be awaiting an Apple product instead of a clone.

The PowerCenter ships with a 512K L2 Cache, not a 256K cache as your article states. You'll need to spend $200 to bring the 7600 up to that level. And three valuable software products shipping with the PowerCenter, Speed Doubler and the FWB HD and CD-ROM ToolKits, would cost around $150 to purchase separately. Also, high-quality or not, the keyboard does save roughly $50. And most important: There's no cost to have the Power Computing model configured to your exact specs.

In short, I am getting a PowerCenter 120 with 32 MB of RAM, 2 MB of VRAM, a 1-GB hard drive, a 512K L2 cache, plus a TelePort Platinum — all for over $1,300 less than what a similarly configured 7600 would have cost. I am also getting the other bundled software and the entire Microsoft Office suite.

For $1,300, I gave up the better hard drive that ships with the Power Mac 7600 but that I can easily purchase for a few hundred dollars. For $1,300, I sacrificed memory interleaving, but if I gave that much of a hoot about speed, I wouldn't be purchasing a 120-MHz processor at a time when 180-MHz is available. And for $1,300, I gave up the built-in video capture of the 7600. (For $1,300, I can do *a lot* better than what comes built into the 7600.) I would have loved to support Apple with my latest purchase, but Power Computing has its finger on the pulse.

Charles Hannum, Jr.
chipjr@earthlink.net

/ The PowerCenter we tested contained 256K of L2 cache; Power later increased the default cache to 512K. As for your other points, we've mentioned these advantages many times in other reviews of Power systems. Guess we got tired of stating the obvious. / HB

The Devil's in the Details

IN YOUR ARTICLE "Power Takes the Lead," I'm confused on a minor point concerning MacBench 3.0. Why did a Power Mac 7500/100 receive two completely different sets of scores? The same machine is supposedly faster in the "How the New Mac OS Systems Stack Up" sidebar than in the "Moving Up to the 604" sidebar. Is MacBench really this inconsistent?

Jeff Johannes
via the Internet

/ Oops. We inadvertently installed different sets of system extensions when we ran the two sets of tests. Actually, far from being inconsistent, MacBench was clever enough to note the discrepancy. Unfortunately, we didn't catch it until the magazine was printed. / HB

Sales Down, Fed Up

THERE SEEMS TO BE an obvious bit of spin needed if one is to understand the significance of the Software Publishers Association's survey that shows fewer Macintosh applications sold in the database, spreadsheet, and word-processing categories (MacWEEK Report, July '96, page 37).

Macintosh users, being more intelligent than PC users, have simply chosen to make do with older versions of their favorite software packages following Microsoft's decision to release bloated upgrade versions of Word and Excel.

Hey, Redmond, release a PowerPC-native version of Word 5.1 and watch your Mac sales go back up!

Mark Gisleson
gisleson@calhoun.lakes.com

The Free Way to Scriptability

I JUST READ "AppleScript for Artists" (July '96, page 89). Chuck Weger recommended PreFab Player as a workaround for programs that lack scriptability. Wake up, Chuck! On DayStar Digital's Web site (http://www.daystar.com/), the company offers Mac users a *free* application called PhotoMatic 2.0.1. I've been using PhotoMatic for about a year now. I couldn't live without it.

Connie Romanishan
via the Internet

The Skinny on Scanners

CONSIDERING THE USUAL high quality of articles in *MacUser*, I was somewhat dismayed to find a couple of erroneous, or at the least misleading, statements in a review of scanners in the July '96 issue (page 39). You wrote: "[T]he UMAX Super Vista S-12 is intended purely as an image scanner." Although you acknowledge that the other two scanners you reviewed include OCR applications, you seem to be unaware that the Super Vista S-12 comes bundled with Wordlinx — perhaps not the best OCR package but certainly passable. By failing to mention Wordlinx, you give the impression that the S-12 lacks OCR capability altogether, which simply isn't true. Hence, the S-12 can hardly be considered "purely an image scanner."

You also stated that the interface of the Super Vista S-12 scan software (VistaScan) "may intimidate scanning novices." As someone who had never used a scanner before in his life, I found the interface quite easy to use. In fact, I was a little disappointed by its simplicity. Moreover, after half an hour of fooling with the S-12's AutoScan, I quickly stopped using it. I found AutoScan incredibly slow and cumbrous.

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LETTERS

in your assessment of the other scanners — the HP ScanJet 4p and the Apple Color OneScanner 600/27. However, the addition of the Wordlinx software, in my opinion, makes the UMAX scanner beat out all other competition in its price range. The UMAX is certainly a bargain!

John Montgomery
HasawChan@aol.com

/ In June 1996, UMAX began bundling the Super Vista S-12 scanner with the Presto Page Manager application, which includes Wordlinx OCR software. The S-12 scanner that we received for review was shipped prior to the scanner's bundling with that application. / RO

FOUR MICE FOR THE Apple Color OneScanner 600/27?! You've *got* to be kidding! Dispatcher has a fatal flaw, which is that it doesn't allow the operator to set the image size of the scan. If I want to scan a logo at 200 percent, I have to jump through a series of inconvenient hoops (and calculations) to get that size — and I'm an *experienced* user! Can you imagine the poor scanning neophyte (the target user for this model) who knows nothing about scanning principles trying to enlarge a scan? Once such users see the results, they'll blame the technology and abandon it altogether.

George Rogic
grogic@whro.org

Jazzercise

WHEN I READ your review of the Iomega Jaz drive (July '96, page 42), I wondered whether you really tested this thing. I agree with your assessment of its speed and performance, ease of use, SCSI connectors, SCSI IDs, and built-in termination. But I question the drive's durability. We've had a Jaz drive for the past few months, and it's eaten up a couple of cartridges — including a client's. Either the cartridge or the drive has a big design flaw. The cartridge has a thin, flimsy metal band that the drive uses for opening the cartridge. This band easily gets stripped and bent and can even get stuck — rendering the cartridge unopenable. Iomega needs to figure out a better way to test these for durability than dropping them from a distance.

Sami K. Yousif
SKYNITE@aol.com

Indecent Exposure

ALTHOUGH WE APPRECIATE the review of our program theFONDler in your July '96 issue (page 48), we would have preferred it if the review had been more accurate.

Frankly, we are surprised at just how many features you missed, including the entire concept of the program.

theFONDler is a complete management and maintenance system and includes many features that work together to contribute to the complete care of a font library. Your own magazine called theFONDler a "Norton Utilities for fonts," in the April '96 issue ("Font Fiddling," page 99).

theFONDler offers two levels of information, Comprehensive and General — 96 different font-status messages. What really irked us is that you complain about the overwhelming amount of information in the reports. However, you missed the preference setting that allows the analysis report to show only the most-pertinent — and less voluminous — information.

theFONDler has a powerful online font database that contains all font-related data, indexes your font library (online, offline, and uninstalled fonts), and works in conjunction with the numbering/naming conflict-resolution feature. This important feature was missed.

theFONDler contains the only commercially available font browser. You can view offline fonts onscreen and preview fonts on, say, CD-ROMs and removable media. This was missed.

We've sold over 10,000 copies in six months, with a two-percent return rate. Although your reviewer did not get it, the customer certainly does.

Paul H. Sibek, President
Rascal Software

Zeal of Approval

I WOULD LIKE TO START this letter by saying that your magazine is an absolute joy to read and that I look forward to reading it every single month. You guys have also done a great job of making the Internet such a wonderful "place." I *love* your online software libraries. In addition to your impressive exclusive utilities, I particularly appreciate the way you rate all the software and don't put low-quality packages on there. Keep up the *great* work!

Kurt Ramsauer
rams@nworks.com

Corrections

The Apple Color OneScanner 600/27 (July '96, page 39) does not ship with any cables.

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Mark Hall
Editor in Chief
Macweek
July 24, 1995

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Good news for people with brains: now there's Canvas™ 5, the only fully integrated graphics program that delivers all the goodies you want at the price you need. | Canvas wrote the book on precision illustration. Now we've added incredible photo design and image editing capabilities–from feathered selections to 24 alpha channels. While Illustrator and FreeHand™ claim to "support" images, only Canvas 5 lets you create them and apply filters to selected areas. Canvas even supports all Photoshop compatible third-party plug-ins. | For publishing, you get the works: auto margins, multi-column guides, left and right master pages (you can even fill text with gradients or textures and still edit it). Our advanced typographic and document control features let you create the next wave in design, or just make day-to-day projects easier. | Once done, create process separations, slide presentations or share your creations with the world by saving them in GIF, JPEG or PDF, and hurling them onto the web. | Canvas 5 is fast, easy, flexible and versatile (at a price that's got the competition crying). | As a great philosopher once said, "What's not to like?"

SELECTING THE BEST GRAPHICS PROGRAM JUST BECAME A NO-BRAINER.

If you own a graphics program, trade up to Canvas 5 for just $149.95 (so little to spend, so much to gain). See your favorite reseller, or order securely online by surfing to http://www.deneba.com/orders/. For a Canvas dealer near you or to order by phone, call 1-800-622-6827 or dial (305) 596-5644. (outside the United States)

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CANVAS 5

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CIRCLE **125** ON READER SERVICE CARD

DENEBA

MacOS

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The way you see.
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CIRCLE **9** ON READER SERVICE CARD

PAMELA PFIFFNER

The Numbers Game

THE OLYMPIC GOLD GLUT should be over by the time you read this. We'll be dazed from the thrill of victory, the agony of defeat, and the jingles and jingoism that accompany this test of sportsmanship and commercial potential.

In athletic competitions, it's pretty easy to determine who's the fastest. If Michael Johnson crosses the finish line first in the 200-meter dash, he's the fastest in that race. We can watch the race and see him lean forward to break the tape that marks the end of the race. We don't know exactly *how* fast he ran until numbers flash on our television screens.

As for determining which computer system is fastest, it's not so easy. Riddle me this: Which machine is faster, a Performa 6400/200 or a Power Mac 8500/180? If you picked the 200-MHz Performa, *aanh,* wrong answer.

"What do you mean?" you say. "I thought the machine with the higher clock rate always wins." That may be true when comparing machines that use the same microprocessor. But the 180-MHz 8500 uses Motorola's PowerPC 604e chip, whereas the 200-MHz Performa uses the slower 603e chip. Differences in the 604e's architecture make it a faster, although more expensive, chip. The 603e chip is less expensive to produce, but it pays a performance penalty. As a result, a 180-MHz chip can be faster than a 200-MHz one.

So how can you tell which machine is the fastest when you're out shopping for a new Macintosh? The answer is the MacUser Processor Rating Program (MPRP). Based on the Processor test in our MacBench 3.0 benchmark tests, the MPRP gives each machine a score by measuring the speed of the Mac's processor subsystem: the chip itself; the logicboard architecture; system memory (RAM); and the L2 cache, if present. The Processor test is painstakingly designed to exercise your Mac's processor the same way you do.

In the three years since its initial release, MacBench has become an industry standard. Now I'm pleased to announce that Apple, Power Computing, and other vendors I'm not yet at liberty to reveal are adopting it as the standard by which their machines' speed is rated. Soon you'll be able to look for the MPRP label when shopping for your next Mac and compare processor-subsystem speed head-to-head. It's simple: With MPRP ratings, the higher number is always faster, regardless of which chip the machine uses or what its clock rate (MHz) is. For example, the Performa 6400/200 has an MPRP rating of 27 and the Power Macintosh 8500/180 a rating of 34.

To ensure that vendors can't skew the numbers, we run the MacBench 3.0 Processor test in our own MacUser Labs test facilities. Vendors are given noneditable logos with a single number rating for the specific model. You'll find these ratings on company data sheets and other sales materials. (If you want to try MacBench out for yourself, you can download it for free at http://www.zdnet.com/zdbop/.)

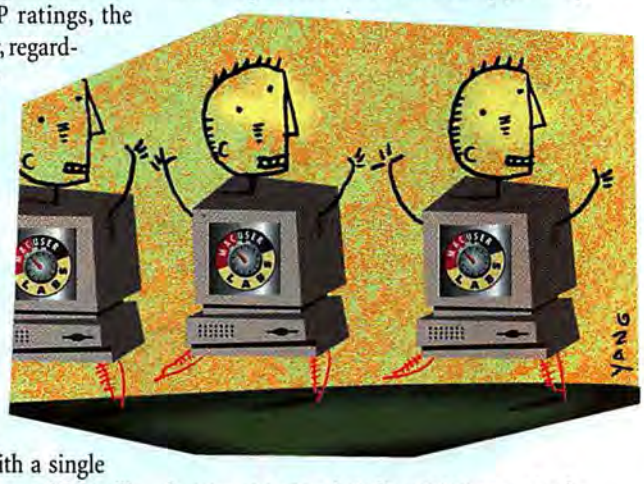
Some say application-based tests are a superior measure of machine performance. We agree that application-based testing is important. Sometimes, using application tasks to highlight a specific aspect of a system's performance is the best way to go.

But for gauging the overall speed of a processor subsystem, there is no suite of application-based tests that does a better job than MacBench. While developing MacBench, ZDBOp, the Ziff-Davis Benchmark Operation, spent countless hours profiling hundreds of application tasks in more than a dozen popular applications. It spent countless additional hours correlating MacBench's results to the results of those application tasks. MacBench exercises your Macintosh in the same way you do when you use it to get work done. MacBench is clean, neat, and accurate.

And that's why Apple, Power, and the others are adopting it.

Live Shot

You don't have to walk into a store to find out how various Macintosh systems perform, however. In conjunction with our MPRP, we're launching another new effort to help you shop



for Macs: MacUser's Online CPU Report Cards. As we test Macs and Macintosh clones for processor-subsystem speed, MacUser Labs will also put the systems through the rest of its rigorous CPU-evaluation process. We'll run a full set of MacBench tests, evaluate each system's pros and cons, tell you which type of user it's best suited for, and give it a mouse rating. And we'll put that information up on our Web site the day the new system ships. The current lineup of Apple and Power Computing systems is waiting for you right now at http://www.zdnet.com/macuser/cpu.html.

The time for the MPRP is now. Apple's licensing of the Mac OS has yielded a bumper crop of new Mac OS-based systems — including the fastest personal computer yet, Power Computing's 225-MHz PowerTower Pro — and the future looks rosy as computer behemoths IBM and Motorola ready their first Mac OS systems. Now, as the PowerPC chip puts pressure on Intel's line of processors, it's more important than ever that Apple and its licensees have a single, accurate scale for articulating the raw processing speed of Mac OS systems. Watch out, Intel.

ILLUSTRATION / JAMES YANG

Nobody Out-Trons SonicTron.™ Not even Trinitron.®

Today, the market is full of Trinitron®-like technologies. And while most companies are satisfied with simply cloning it, ViewSonic® has improved it.

SonicTron™, ViewSonic's newest color screen technology gives even the most demanding Macintosh® owners, desktop publishers and graphics users vivid, saturated colors and high contrast images so intense they're staring in wide-eyed amazement.

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SonicTron has been getting some pretty impressive reviews. Says Jerry Pournelle in *Byte* magazine, "The User's Choice Award for this year goes to the ViewSonic Professional Series PT810."

MacUser gave it a 4-mice rating and added, "It boasts image quality so good even demanding graphics artists and desktop publishers will be pleased."

Computer Reseller News gave the SonicTron PT770 their Editor's Choice award in April, 1996.

The price is right.

Both ViewSonic's PT810 and PT770 SonicTron monitors deliver astonishing clarity—and pricing the other Trons can't get close to.

Ranging from 17" to 21" (15.9" to 20.0" viewable), SonicTron has an aperture grille mask for sharp focus and brilliant color, OnView® controls for easy screen adjustments and Colorific™ software to insure that printer and monitor color profiles match perfectly.

A limited 3 year warranty on CRT, parts and labor, and an optional Express Exchange™ Service program that insures 48 hour replacements are also part of the deal. If you'd like to see the Tron that all the others look up to, call your reseller.

Or, for more information, call (800) 888-8583 ask for agent 5446.

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*	$1,895	$2,299	$895	$1,099

* MSRP as of August 1, 1996. Prices and specifications subject to change without notice.

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CIRCLE **100** ON READER SERVICE CARD

NEWS

Longer Wait for Multiple-OS Mac

Apple's PPCP computer won't ship until 1997.

IS IT ANY SURPRISE that the Mac version of Apple's new multiple-OS platform, formerly known as CHRP (Common Hardware Reference Platform) and now called PowerPC Platform (PPCP) is officially late?

Originally slated to ship in the second half of 1996, the first Power Macs capable of running a variety of operating systems won't arrive until sometime in the first half of 1997. Apple says the delay is due in part to its intent to make the first PPCP-based Macs more than just PPCP-compliant. According to Ross Ely, Apple's Power Mac product-line manager, the company wants its PPCP systems to incorporate other new advances in hardware technology as well. Unfortunately, building in those advances requires additional engineering work — and additional time.

However, there is another reason for the delay, Ely admitted. Apple's efforts right now are focused on getting the PPCP version of System 7.5.3 done, so that Mac OS licensees can start work on their PPCP-based machines. "We expect clone vendors to come out with [a PPCP] product in late '96, early '97, and Apple will follow suit afterward," he said. "The overall strategy for Apple with [PPCP] is to encourage cloning."

As if to emphasize this point, Apple also announced a new release schedule for the Mac OS for PPCP. According to Apple, this special version of System 7.5.3 is now being seeded to Mac OS licensees for testing. Apple will collect feedback from the licensees to determine what still needs to be done, and based on the results, it will figure out when the OS will be ready for users. An Apple spokesperson said the final version of the PPCP Mac OS will probably be available sometime in the first three months of 1997.

The PowerPC Platform is a hardware specification that takes into consideration the requirements of several different operating systems that are currently compatible with PowerPC systems and lets all of them run on a single PowerPC system. Those operating systems are Windows NT; OS/2; Solaris (Sun Microsystems' UNIX); AIX (IBM's UNIX derivative); NetWare; and, of course, the Mac OS.

Despite this impressive list of operating systems that could run on a PPCP-based Power Mac, Apple has said its main interest in the new platform is to provide access to cheaper and more widely available components and to attract more clone vendors to the Mac OS. PPCP will enable Mac-clone vendors to create their own, differentiated designs instead of having to base their efforts on Apple logic boards.

It is this great flexibility that has made implementing a PPCP version of the Mac OS so difficult. The System 7.x operating system expects certain hardware to always be present on the logic board. Because a vendor building a PPCP-based clone may not include the entire Mac chip set and, in fact, is unlikely to include much in the way of Mac-specific hardware, the operating system must be abstracted from its Mac-hardware dependence.

Apple said its first PPCP-based Macs will be targeted at customers its research has shown are most interested in running multiple operating systems, such as those in big business and education.

In other Mac-clone news, computer-industry heavyweight Motorola said it would be demonstrating prototypes of its first Mac OS-based systems this August. Systems expected to be on display include a pre-PPCP model, code-named Tanzania (see Clone Watch, September '96, page 23), and Motorola's first fully functional PPCP machine. Motorola may also announce its plans for selling a Mac clone in the U.S. / *ANDREW GORE*

FUTURE TECH

Mac Users Profit from PC Woes

YOU'RE ABOUT TO BENEFIT from a solution to a problem you don't even have.

The problem belongs to the Wintel world, where connecting mice, keyboards, modems, QuickCams, and other low-bandwidth peripherals to computers is difficult, because of nonstandardized serial interfaces and complex installation routines. To the rescue has come a consortium of PC heavyweights who are promoting a new serial-connection system called USB (*universal serial bus*).

USB is gaining momentum, and not just because it provides the plug-and-play convenience that we pampered Mac folks have enjoyed since 1984. There are other benefits we'll also enjoy when USB ports begin appearing on PowerPC Platform Mac OS systems next year.

First, USB is fast: It's able to transfer a full 12 megabits of data per second — far more than GeoPort's top speed of 2 megabits per second. Second, it's hot-pluggable — you don't have to shut the computer down to attach a USB device. Third, you can attach a *lot* of devices — up to 127. Finally, it's cheap.

Speed and convenience will enable new uses: For starters, just imagine multiplayer gaming with each player using a 3-D data glove and visualize CTI (*computer telephony integration*) systems that incorporate T1-based compressed-video teleconferencing.

Although both USB and Apple's highly touted FireWire are serial interfaces, they're not competitors: Since FireWire is over 30 times as fast as USB, it's overkill for a mouse port but great for data-chubby tasks such as producing digital video. Odds are the two will coexist. / *RIK MYSLEWSKI*

ILLUSTRATION / RANDY LYHUS

NEW & NOTABLE

HARDWARE

Global Village TelePort Platinum Comm Slot Edition. Let your compatible Performa and Power Macintosh computers make the call with this 28.8-kbps internal voice-capable fax-modem card. $240. 800-736-4821 or 408-523-1000; http://www.globalvillage.com/.

Shinko ColorStream Digital B. This dual-engine dye-sublimation/thermal-wax printer can produce 300-dpi color proofs that are as large as 12.2 x 18 inches. $14,495. 800-974-4656 or 510-441-1175.

Proxima DP5500. According to its maker, this polysilicon projector is the brightest of its kind available and it produces fully saturated images as large as 30 diagonal feet. $9,195. 800-447-7692 or 619-457-5500; http://www.proxima.com/.

▼ **NEC MultiSpin 8Xe.** This external 8x CD-ROM player has a 140-ms average access time, which

means that it plays multimedia titles faster than most other currently available CD-ROM drives. $449. 800-632-4636 or 508-264-8000; http://www.nec.com/.

Pinnacle Tahoe 640. Weighing in at under 2 pounds, this magneto-optical drive, which uses 3.5-inch 640-MB optical cartridges, lets you take *all* your data on the road. $799; cartridge, $99. 800-553-7070 or 714-789-3000; http://www.pinnaclemicro.com/.

Epson ELP-3300. The three high-aperture LCDs in this projector generate images that have a maximum resolution of 640 x 480 dpi on 300-inch (diagonal) and smaller screens. $9,599. 800-463-7766 or 310-782-0770; http://www.epson.com/.

NovaLink NovaModem 288 for Macintosh. Turn your PowerBook into a traveling voice-mail system with this voice/data/fax modem on a PC Card capable of 28.8-kbps data transfer. $299. 800-668-2546 or 510-249-9777; http://www.novatech.com/.

Panasonic EABMPC250. This sound system, which consists of two speakers and a subwoofer, promises clear, full audio for your games and multimedia presentations. $149. 800-742-8086 or 201-348-7000. / *CAROLYN BICKFORD*

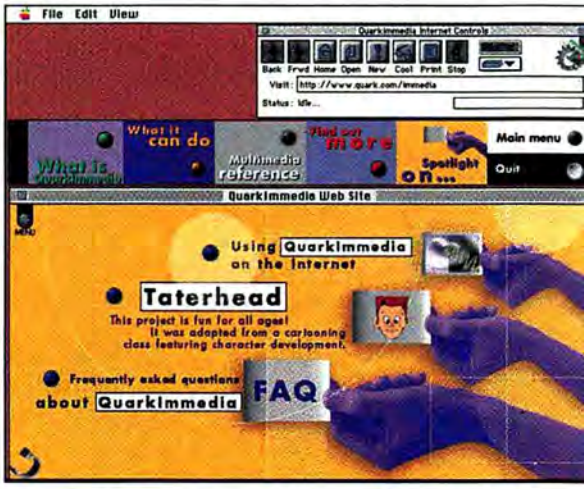
FIRST LOOKS

QuarkImmedia:

Interactive DTP for CD-ROMs and the Web

CONVERTING DESIGNS made for print into equally impressive multimedia projects sometimes seems as impossible as turning water into wine. Quark is hoping to perform just such a miracle for QuarkXPress experts this fall with QuarkImmedia, a multimedia-authoring XTension that has been in the works since 1995. Our beta look proved QuarkImmedia useful for repurposing layouts into multimedia presentations, but for Internet-related projects, it didn't carry much kick.

QuarkImmedia adds a Multimedia Settings palette to QuarkXPress. Using the commands in the palette, you can easily create scripts, transition effects, and simple animations; designate links to other objects or URLs; and drop QuickTime movies into picture boxes. Your QuarkXPress page becomes your QuarkImmedia screen.



You can publish interactive presentations made with QuarkXPress on the Web, but they can be seen only with the awkward QuarkImmedia viewer.

QuarkImmedia doesn't give you as much control as Macromedia Director, which also requires complicated scripting. On the other hand, you have QuarkXPress' precise typographical and layout tools as well as QuarkImmedia's multiple output options, none of which you'll find in simpler multimedia-presentation programs.

The free QuarkImmedia viewer lets you view projects easily over an intranet or on a CD-ROM, but it's also QuarkImmedia's weakness on the Web. Most multimedia Internet products use an integrated browser plug-in, but QuarkImmedia makes you launch the viewer separately as a helper application. QuarkImmedia streams sound in real time and uses caching technology to download video, but with a 28.8-kbps modem, we had to wait almost a minute per page to finally see the examples on the QuarkImmedia Web page at http://www.quark.com/immedia. / *SCHOLLE SAWYER*

PROS QuarkImmedia makes it easy to add multimedia to QuarkXPress documents.
CONS Viewing QuarkImmedia-created content on the Web is clumsy.
INFO $995. Quark: 800-788-7835 or 303-894-8888; http://www.quark.com/.

CLONE WATCH

The SuperCharged SuperMac Lineup

BY BEEFING UP its SuperMac-brand line of Mac clones, UMAX Computer is expanding its offerings for home and office and increasing the competition for Apple and Power Computing.

For the home, UMAX now offers the C500/140 and the C500T/160. The $1,600 C500/140 is a desktop computer with an upgradable 140-MHz PowerPC 603e processor and is configured with 16 MB of RAM; a 1.2-GB hard-disk drive; 256K of L2 cache; a 28.8-kbps internal modem; 1 MB of onboard VRAM, for graphics display; and a 6.7x CD-ROM drive. The tower design, the $1,800 C500T/160, is similarly configured but has a 2-GB hard-disk drive and an 8x CD-ROM drive. Each system has two PCI slots on a riser card.

UMAX is aiming its C500T/180 at businesses. It's largely similar to the C500T/160 but its PCI riser card has four PCI slots, one of which is filled with a 2-MB PCI accelerated-graphics card, and unlike either of the home-oriented models, it has built-in 10BASE-T Ethernet support. UMAX's new configuration of its higher-end SuperMac S900 (see review in this issue) is also targeted at business customers. / *HENRY BORTMAN*

Canvas 5: An Artist's Omnibus

LONG AWAITED and oft delayed, Deneba's Canvas 5 should finally be available by the time you read this — or so we've been promised. Your patience will get its reward, because Canvas 5 is bursting with features — and not only those found in traditional illustration programs. Besides now being able to work with both bitmapped and vector graphics à la Adobe Illustrator 6.0 and FreeHand 5.5, Canvas 5 adds page-layout, 3-D, presentation tools, and a few unique creative goodies to boot.

Canvas 5's abundant tool set is tucked away neatly in a floating palette as hierarchically organized tool groups, which you can individually tear off to make separate palettes. When you create a new document with Canvas 5, it asks you whether you're creating an illustration, a publication, or a presentation; although your choice won't change the tool palette, it will transparently alter the metaphors used in the Layout menu, so you'll work in layers with an illustration but with pages in a publication.

You have all the illustration tools you'd expect — plus a whole lot more. For instance, you can now extrude objects into 3-D space and rotate them within your drawings, for some fascinating effects. Canvas 5 can export objects in DXF format, ideal for taking 2-D work into a CAD program. You'll also find Boolean editing features, so you can, for instance, use one object to cut away part of another. Text mavens will enjoy the new page-layout-oriented controls, which include limited, but respectable, kerning and leading and the ability to use text blocks and even link them. You can also create style sheets for any element and can fill strokes (not just objects) with patterns or neon colors.

The Canvas 5 beta version we previewed had as many bugs as it did features, which isn't overly surprising for a product so complex. But if the final product doesn't ship on time — again — it's probably because Deneba's just being careful and making sure its upgrade-and-a-half arrives in clean condition. */ CAROLYN BICKFORD*

PROS Canvas 5's power may make the program the best all-in-one graphics application ever.
CONS Although Canvas 5 is versatile, type handling and 3-D tool sets are limited.
INFO $599. Deneba: 305-596-5644; http://www.deneba.com/.

IN BRIEF

Common Interface Unites Adobe's Top Programs

SINCE ACQUIRING ALDUS two years ago, Adobe has been working under the hoods of Adobe PageMaker, Photoshop, and Illustrator to make the programs' engines look and work the same. This fall the three Mac stalwarts will have a common new interface as well.

The three programs will share a common tool bar and keyboard shortcut commands as well as many palettes. The redesign succeeds so well in making the programs look alike that Adobe has had to give a clue to help us figure out which one we're in: a small piece of splash screen at the top of each tool bar.

Adobe is also aiming for fluid drag-and-drop and cut-and-paste among all three. Also in the works is a common plug-in structure for the programs, so you'll be able to use Adobe Photoshop plug-ins in PageMaker and vice versa. */ SCHOLLE SAWYER*

IBM Saves OpenDoc

AN APPLE-ONLY STANDARD is an oxymoron: Without industrywide acceptance, even the best technologies remain insular. QuickTime is a good example of an Apple invention that was accepted in the PC world and prospered; QuickDraw GX is one that wasn't and withered.

IBM is making sure that OpenDoc follows the QuickTime model: It has released beta versions of OpenDoc for Windows 95 and Windows NT (as it previously did for OS/2 and AIX). A final version is scheduled to ship in the third quarter of this year; information on the beta program can be found at http://www.software.ibm.com/clubopendoc/.

Although most of the non-Mac OpenDoc effort has, until now, been focused on OS/2, expect such OpenDoc players as Asset Software International, Cirrus, Secant, True Spectra, and Voice Pilot to make their OpenDoc parts available in Windows 95 and NT versions. The more the merrier — a healthy crop of OpenDoc parts on any and all platforms can only be good news. */ RIK MYSLEWSKI*

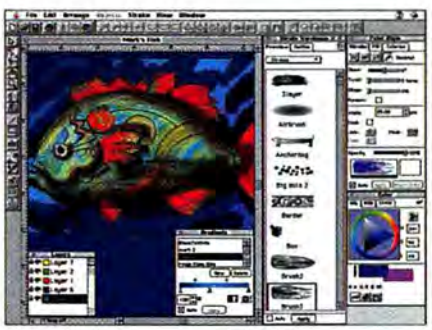
A Fractal Twist to Bézier Curves

IF YOU LOVE the natural-media effects of Fractal Design's Painter but need the speed, resolution independence, and easy editability of drawing programs, you'll be glad to hear that Fractal is providing both in one program this fall.

Fractal Design's Fractal Expression lets you create intricate artwork by using vector drawing tools such as a Bézier pen, but your strokes look as if you drew them with real-world tools, such as a crayon or a felt-tip pen. Expression's tools are also pressure-sensitive. You could make calligraphy characters with an ink-pen stroke and then modify the Bézier points.

You can either draw strokes with real-life art tools or have Expression fill strokes with clip-art images. You can even fill strokes with a *variety* of images. For instance, if you had a multiview stroke containing an oak, a spruce, and a maple tree, a randomly generated forest could materialize as you drew.

Expression supports the Adobe Illustrator, Adobe Photoshop, and Apple QuickTime file formats, among others. It's not a substitute for powerhouses such as Adobe Illustrator or Macromedia FreeHand, but Expression will add significant creative possibilities to your toolbox. $449. 800-297-2665 or 408-688-5300; http://www.fractal.com/. */ SCHOLLE SAWYER*



Fractal Design's new illustration program, Fractal Expression, combines the natural-media creativity of the company's paint program, Painter, with the control of vector-based drawing.

NEW & NOTABLE

SOFTWARE

Infini-D 3.5. The latest version of this popular, powerful 3-D application adds lens flares, animated Boolean rendering, improved shadow handling and Phong shading, faster ray tracing, and a host of interface improvements. Specular: 413-253-3100; http://www.specular.com/.

OptiCal. Calibrate monitors to each other or to specific standards, including NTSC or SWOP; create custom monitor settings; and save calibrations and color settings as ICC profiles with this cross-platform monitor-calibration software. $395. The Color Partnership: 800-554-8688 or 619-259-8688.

Bookends Web. Format your bibliographies for publication on the World Wide Web with the same software you use to create and track them. $179. Westing Software: 800-325-1862 or 415-945-3871; http://www.westinginc.com/.

Carrick. This utility's encryption algorithm supports 448-bit passwords that are so secure that federal regulations prohibit the program's export. $159. Azalea Software: 206-932-0234; http://www.encryption.com/.

CinéMac Screen Saver Factory. Turn Macromedia Director Projectors into distributable Mac and Windows screen savers. MacSourcery: 619-747-2980; http://www.macsourcery.com/.

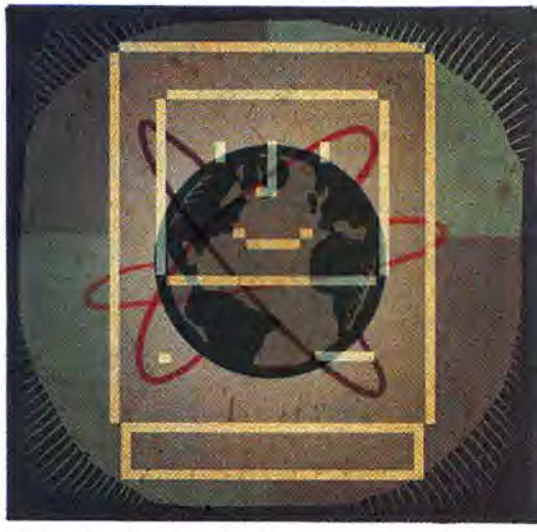
▼ **Slicer.** Produce volumetric 3-D visualizations of your data, and analyze the resulting images to identify data trends with this data-analysis

tool. $695. Fortner Research: 800-252-6479 or 703-478-0181; http://www.fortner.com/.

Scientific Word 2.5. This technical word processor formats scientific formulas; creates cross-references to sections, pages, and other document markers; and includes the full set of American Mathematical Society symbols. CD-ROM version, $375; floppy-disk version, $410. TCI Software Research: 800-874-2383 or 505-522-4600; http://www/tcisoft.com/tcisoft.html. / *CAROLYN BICKFORD*

It's About Time, Guys

Major Internet service providers are finally learning to speak Mac.



ALMOST TWO YEARS after releasing its first Windows-only Internet-access software, NetCruiser, Netcom finally has a Mac offering ready to go. CompuServe too has belatedly added Mac support to its Internet-only offering, SpryNet. Apparently somebody in these companies has finally noticed that a far higher percentage of Mac users than Wintel jockeys cruise the Infobahn.

NETCOMplete, also available for Windows, is both access software and a set of custom services for Netcom users. The software relies on Netscape Navigator for most Internet access (Web, mail, news, FTP, and Gopher) and also includes Quarterdeck's Global Chat IRC (Internet Relay Chat) software and a PPP dialer and log-in application. Netcom customers are not forced to use Navigator, and the company is hedging its bets in the browser war by adding Internet Explorer in a future NETCOMplete release.

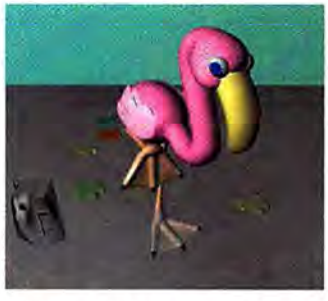
Whether you call them "added value" or the return of online-service-style content, Netcom's additions to NETCOMplete's Personal Services section seem designed to make Netcom attractive to online-service users who do more than exchange e-mail or chat. Personal Investment, a joint project of Netcom and Telescan, will provide financial and investment information to Netcom users at no cost, through a Netcom-only Web site. Netcom plans to add more services in the coming months.

Whereas Netcom brings a touch of the online world to Internet users, CompuServe has added an Internet-only offering to its portfolio. The first version of SpryNet for the Mac lagged behind its Windows counterpart by four months, shipping first as a software bundle that included Spry Mosaic and the Z-Mail mail reader. Recently, the company added Internet Explorer to the bundle and now makes Netscape Navigator available on its Web site.

Netcom: 800-638-2661 or 408-881-1815; http://www.netcom.com/. CompuServe: 800-777-9638 or 206-957-8000; http://www.sprynet.com/. Each charges $19.95 per month for unlimited Internet access. / *SHELLY BRISBIN*

Plug In to Version 1.5 of QuickDraw 3D

USING PLUG-INS is a great way to expand the power of an application — witness Adobe Photoshop and Netscape Navigator. Soon you'll be able to add QuickDraw 3D to the list: The upcoming version, 1.5, will have support for rendering via third-party plug-ins. The upshot is that you get high-quality, integrated rendering from within any 3-D modeler that supports QuickDraw 3D and that you have a wide selection of rendering options. Already announced, for example, is a high-quality radiosity renderer from LightWork Design, a U.K. developer. One big benefit: Plug-in renderers should cost much less than many standalone rendering programs.



QuickDraw 3D 1.5 will enable 3-D applications to work with plug-in renderers, such as the one that created this cartoon image.

Another extension, to the 3DMF format, will let objects be rendered at different levels of detail, depending on how far away they are — a useful feature for interactive renderings, such as those used in virtual-reality projects. Other new features will include cross-platform compatibility — thanks to a Windows version of QuickDraw 3D — and support for multiprocessor Mac OS systems. The QuickDraw 3D viewer will also get an upgrade and will feature a home button for returning you to your original view and the ability to constrain your camera along an axis. QuickDraw 3D 1.5 should be available this fall at http://quickdraw3d.apple.com/. / *CAROLYN BICKFORD*

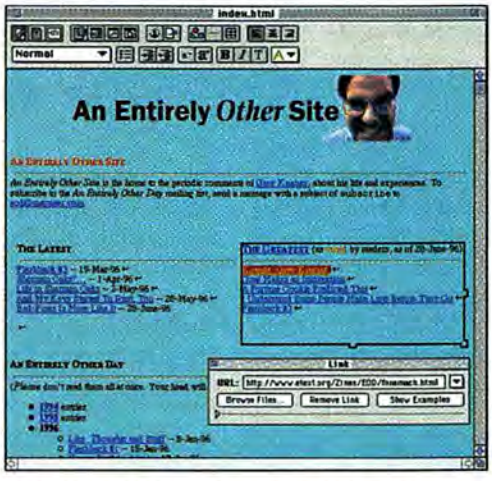
NET.CETERA

PageMill Under WYSIWYG Attack

Adobe's Web authoring application faces its first real competition.

OVERNIGHT SENSATION is not an overstated description of Adobe PageMill. We Mac folks are used to having it easy, and using PageMill was the first easy way to create Web pages without having to deal with HTML code. However, a slew of new visual HTML authoring tools is arriving, and PageMill is no longer the only WYSIWYG Web-page creator in town — in fact, it may no longer be the best.

Arriving on the scene this June without much fanfare was GoLive, a $49 visual HTML editor from a German company, GoNet. GoLive offers an interface similar to PageMill's and lets you edit text styles, colors, and sizes. GoLive also enables you to create frames, Netscape extensions to HTML that let you display more than one Web page in a browser window. However, GoLive seems to have been rushed to market: Some parts of its interface, especially forms creation, are in dire need of a redesign. In addition, GoLive is quite sloppy when it comes to text handling, allowing users to type characters such as curly quotes and em dashes, even though those characters can't be displayed on the Web. (A *MacUser* review of GoLive is available exclusively online at http://www.zdnet.com/macuser/mu_0896/reviews/review13.html.)



Claris Home Page lets you graphically edit Web pages, including ones with embedded tables.

PageMill's strongest competitor is Claris Home Page, a $99 WYSIWYG Web authoring tool Claris bought from San Andreas Systems back when the product was still code-named Loma Prieta. Claris Home Page's simple interface is what you'd expect from a Claris product — clean and easy to use — but what's impressive is the product's depth. Home Page supports all the features PageMill 1.0 had but adds support for colored text, multiple text sizes, and the placement of Java applets. Most important, Home Page lets you create tables and frames, which are difficult to create by hand in raw HTML. And if you do need to edit raw HTML code, you can do it directly from within the Claris Home Page window. Best of all, Claris Home Page seems to be a meticulously designed product, with none of the lapses that are apparent in GoLive.

Although most, if not all, of Home Page's features are scheduled to be included in PageMill 2.0 (see Net.Cetera, July '96, page 28), the latter product wasn't expected to be released until September. Meanwhile, Claris Home Page's fully functional beta edition was released on the Web in late June.

Finally, let's not forget Netscape, whose $79 Navigator Gold will offer in-browser HTML editing when it ships this summer. All in all, it means that Adobe is going to have a very tough time keeping PageMill at the top of the HTML-editing heap. GoNet: http://www.gonet.de/. Claris: http://www.claris.com/. / *JASON SNELL*

ILLUSTRATION / RANDY LYHUS

IN BRIEF

Extreme Storage

UNTIL NOW, the tremendous demands professional video editors put on storage systems have kept the Mac on the periphery of true broadcast-quality online video editing. Today, fibre-channel (FC) technology is breaking that bottleneck.

Transoft has announced a new ultrahigh-speed storage network that's hearty enough, in Transoft's tests, to allow three Macs using Transoft's proprietary file-control software and equipped with StudioBOSS FC PCI cards connected to a Transoft ProRAID-FC RAID system to *simultaneously* read, from the *same* source file, 300K-per-frame, 30-frame-per-second video that has eight audio channels. The StudioBOSS system can maintain 75-MB-per-second throughput (FC's current theoretical maximum is 200 MB per second, and 400-MB-per-second systems are on the horizon).

Currently, prices are as high-end as performance: The system, which lists for $4,995 per workstation, includes file-control software, a PCI FC card, FC driver software, and assorted necessary plumbing. 805-897-3350; http://www.transoft.net/. / *RIK MYSLEWSKI*

Extensis Expands to the Web

EXTEND PHOTOSHOP'S FEATURES and take your QuarkXPress designs to the Web, with Extensis' newest extension suites. PhotoTools gives you six Photoshop plug-ins, the ability to create floating tool bars, and searchable online tips for $99.95. The plug-ins include PhotoShadow, which lets you interactively create a variety of drop shadows; PhotoText, for inserting and formatting text in a Photoshop document; and PhotoGlow, which lets you create color radiance around a selection. QuarkXPress-to-HTML converter CyberPress automatically converts images to GIF format and retains text style when it exports designs to the Web. CyberPress, $149.95, includes PageMill 2.0, so you can add more HTML features to your Web page. 800-796-9798 or 503-274-2020; http://www.extensis.com/. / *CAROLYN BICKFORD*

The Geek Beat

NETWORKING. Fast Ethernet just isn't fast enough for the members of the Gigabit Ethernet Alliance, an industry group that formed recently to support the development of a 1,000-Mbps Ethernet standard. Mac veteran Asanté Technologies has already signed on, along with 3Com, Cisco, Compaq, Intel, and others. Modem maker U.S. Robotics jumped into networking with the TotalSwitch Ethernet Switching Hub. The modular device supports 10BASE-T, 10BASE-2, 100BASE-TX, 100BASE-FX, and others. Prices for the 2-to-12-port switch begin at $1,995. NetGear, a new subsidiary of Bay Networks, will launch a line of inexpensive Ethernet and Fast Ethernet hardware, beginning with 4-, 8-, and 16-port 10BASE-T hubs ($109 to $349) and 8- and 16-port Fast Ethernet hubs ($995 and $1,650). A 2-port Ethernet switch ($650) and an ISDN router ($1,290) will be released shortly thereafter. Sonic Systems' FastBridge 10/100 ($595) bridges Ethernet to Fast Ethernet. U.S. Robotics: 800-877-2677; http://www.usr.com/. NetGear: 800-638-4327 or 408-988-2400; http://netgear.baynetworks.com/home/. Sonic: 408-736-1900; http://www.sonicsys.com/.

DEVELOPMENT TOOLS. An early version of the first Mac Ada compiler, GNAT-Mac, is available at http://gnat-mac.com/macada/. The final version, due this fall, will be bundled with Tenon's MachTen UNIX-on-the-Mac software. GNAT is based on GNU Ada. Both versions require MachTen. Mainstay has upgraded VIP-BASIC to version 2.0 (estimated street price, $195). The new release features a graphical application builder and a BASIC-to-C translator. Tenon Intersystems: 805-963-6983; http://www.tenon.com/. Mainstay: 805-484-9400.

DATABASES. Crystal Reports, a database-report-creation tool, will come to the Mac, as a result of an agreement between Crystal and Oracle. Crystal Reports will be included with Oracle Power Object 3.0, due for release this fall. Oracle: 415-506-7000; http://www.oracle.com/. / *SHELLY BRISBIN*

NEW & NOTABLE

RESOURCES

ClipModel Library. This collection of over 110 pretextured, unlocked, and ready-to-render 3-D models includes interior furnishings, articulated male and female human models, and terrain models. $199. Acuris: 800-652-2875 or 215-493-4302; http://www.acuris.com/.

▼ 18 Perfect People. Nine precisely proportioned and jointed human models are ready for importing into any 3-D program. $399. Acuris: 800-652-2875 or 215-493-4302; http://www.acuris.com/.

Providing Internet Services via the Mac OS. Cowritten by *MacUser*'s Senior Editor/Online, Jason Snell, this book explains how to set up, provide, and maintain Internet services on a Mac. $34.95. Addison-Wesley: 800-822-6339 or 617-944-3700; http://www.aw.com/devpress/.

Java Programming for the Internet. Learn design concepts, applet essentials, and advanced Java networking capabilities. The book comes with the Java Developers Kit. $49.95. Ventana: 919-544-9404; http://www.vmedia.com/.

KickAss Java Programming. If you enjoy instruction with attitude, you'll get plenty from this guide to advanced Java techniques, which includes a library of special effects for your Web page. $39.99. The Coriolis Group: 800-410-0192 or 602-483-0192; http://www.coriolis.com/.

FontSneak. Figure out which fonts you'll need in a QuarkXPress, Adobe PageMaker, Adobe Illustrator, or Macromedia Director file with this stand-alone utility *before* you launch the document. $89.95. Rascal Software: 805-255-6823; http://www.rascalsoft.com/.

AdCompress. Scan camera-ready ads into Photoshop with this plug-in, which compresses files in a lossless format and creates OPI-compatible view images you can place in your layout for pagination. $995. Digital Technology: 801-226-2984.

PhotoCaster. With this Macromedia Director 5 Xtra, you can import a Photoshop 3.0 file directly into a Cast window and turn each layer of the file into an individual cast member, generate a custom color palette from the file, and more. $149. Media Lab: 800-282-5361 or 303-499-5411; http://www.medialab.com/xtras/.

Stylist. Effects you create with this Adobe Illustrator 6.0 plug-in, such as railroad tracks running on top of a path, automatically update whenever you make any changes to the underlying artwork. $199. Alien Skin Software: 919-832-4124. */ CAROLYN BICKFORD*

Digital Cameras Snap into the Mainstream

IT USED TO BE that when you pulled out a digital camera, you were sure to draw the attention of any and all gadget-minded guys and gals in your vicinity. Not anymore.

Evidence abounds that consumer-level digital cameras are going mainstream. For one, prices are dropping precipitously — the tiny Kodak DC20, for example, can be found for a mere $349. Most major manufacturers — Apple, Kodak, and now Casio (see photo) — are well into their second-generation models. And finally, the surest sign of mass acceptance has emerged: third-party accessories.

The new $699 Casio QV-30 provides image quality identical to that of the lower-priced Casio QV-10 but adds a larger (2.5-inch) LCD viewfinder and a 103mm-equivalent telephoto lens.

DC Pro offers users of consumer-level digital cameras an opportunity long enjoyed by film-loving shutterbugs: the chance to fritter away their disposable income on a wide range of accessories. The New Jersey-based distributor now offers the Tiffen line of wide-angle ($79), super-wide-angle ($89), telephoto ($79), and close-up lenses ($59 for a set of three), plus a variety of tripods, filters, and carrying cases. The Tiffen lenses fit the Apple QuickTake 100 and 150, Kodak DC40 and DC50, and Epson Photo PC; an inexpensive adapter allows them to be mounted on the Casio QV-10 (but not yet the QV-30), and a Kodak DC20 adapter will be available this fall. Casio: 800-962-2746; http://www.casio-usa.com/. DC Pro: 800-522-7835 or 516-434-8800. */ RIK MYSLEWSKI*

The Esperanto of Imaging

MUCH CAN GET LOST in the translation when you move digital images between file formats — but there's little you can do to prevent such trouble when your digital camera takes pictures in one format and your color printer works best with another. Now industry heavyweights Kodak, Microsoft, and Hewlett-Packard have teamed up with maverick graphics developer Live Picture and developed a new image-file format, FlashPix, which they hope will become a universal standard for digital images from start to finish.

FlashPix's major appeal is that you can manipulate even large FlashPix files quickly in a limited amount of RAM, thanks to Live Picture's FITS technology. FlashPix is well suited for electronic publications, since it supports the RGB and Photo YCC color spaces and can use JPEG compression — although without built-in CMYK support, its practicality as a standard may be limited.

Apple, Canon, Macromedia, and Corel have already expressed interest in incorporating FlashPix into digital cameras, scanners, image-editing applications, image databases, and printers. But the new format's success may ultimately rest on the shoulders of publishing-application giant Adobe Systems, which, at press time, had not expressed plans to incorporate the format into any of its applications. */ CAROLYN BICKFORD*

THE OFF BEAT

Mouse Pizza

ORDER A MEDIUM-sized pepperoni and green-pepper pizza from Computer Rascals, and it'll be delivered straight to your office — as a mouse pad. If pizza's not your dish, how about a baseball, basketball, golf ball, soccer ball, or yin-and-yang symbol? These $15 pads, 10.5 inches in diameter, were originally designed for children, who may need a large arena for their sometimes uncoordinated mouse strokes. Your inner child will be tickled as well. Now all we need is a mouse that doubles as a pizza slicer . . . . 800-545-6721 or 802-649-2621. */ NANCY PETERSON*

PHOTOGRAPHY / MICHAEL FALCONER

Net-Savvy Newton

The long-awaited Newton Internet Enabler is finally released.

ONE BY ONE, the major complaints about the Newton are being resolved. Poor handwriting recognition? Fixed. No backlighting? The 130's got it. Lack of Internet access? Not anymore. Suddenly, the Newton has vaulted from Doonesbury laughingstock to cutting-edge Net traveler.

Until now, the Newton had been the remora of computers, feeding off another computer's TCP/IP link to access the Internet. With the shipment — finally! — at this summer's PC Expo of the Newton Internet Enabler (NIE), the MessagePad no longer requires a surrogate to access TCP/IP-based services. NIE supports most industry-standard Internet protocols, including HTTP, HTML, SMTP, POP3, IMAP4, PPP, SLIP, and UDP; it has a script-based dialer as well as a domain-name resolver (DNR).

The overflow crowd at PC Expo's Newton booth was evidence that interest in Apple's much-maligned PDA remains high. In fact, Apple claims that those working on Internet-savvy Newton solutions include over 50 developers, among them such familiar names as Qualcomm, with Eudora for Newton, and those less familiar, such as AllPen Software, with NetHopper 2.0, a Newton-based Web browser.

NIE requires Newton OS 2.0 and is recommended for use with the MessagePad 130. It is available at http://dev.info.apple.com/newton/newtondev.html; for more information, call 800-767-2775. / *ANDREW GORE*

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of July 1, 1996. Prices (other than those for compact models, Performas, and LCs) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

MAC MODEL	NEW	USED
Classic II (4/40)	•	$250
LC III (4/80)	•	$300
Performa 5215CD (8/1GB)	$1,699	$1,300
Performa 6220CD (16/1GB)	•	$1,250
IIsi (5/80)	•	$225
IIci (4/80)	•	$325
IIfx (4/80)	•	$400
Quadra 610 (8/160)	•	$450
Quadra 630 (4/250)	•	$500
Quadra 650 (8/230)	•	$700
Quadra 800 (8/230)	•	$850
Quadra 840AV (8/230/CD)	•	$1,150
Quadra 950 (8/230)	•	$1,100
Power Mac 6100/66 (8/350/CD)	•	$700
Power Mac 7100/80 (8/700/CD)	•	$1,100
Power Mac 7200/90 (8/500/CD)	•	$1,250
Power Mac 8100/100 (16/1GB/CD)	•	$1,650
Power Mac 8500/120 (16/2GB/CD)	•	$2,850
Power Mac 9500/132 (16/2GB)	•	$2,800
PowerBook 165c (4/80)	•	$850
PowerBook 180 (4/120)	•	$800
PowerBook 190cs (8/500)	$1,499	$1,200
PowerBook 540c (4/320)	•	$1,400
PowerBook 5300cs (8/500)	$1,999	$1,600
Duo 250 (4/200)	•	$700
Duo 280c (4/320)	•	$1,350
Duo 2300c (8/750)	$2,999	$2,400
Power Computing Power 100 (16/1GB/CD)	•	$1,000
Power Computing PowerWave 604/150 (8/1GB/CD)	$3,299	$2,250

• = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 770-955-0569 or visit http://www.uce.com/. And find it on ZD Net, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER).

CD-ROMS

Elephants and Donkeys on Parade

ELECTION DAY IS COMING. Network TV is rife with mendacious attack ads, solemn commentary, and enough opinion polls to employ an entire convention hall full of statisticians — but are *you* having fun yet? If not, maybe one of these political CD-ROMs will get you in the mood.

NIXON THE CD-ROM. For some old-fashioned political cynicism, relive Watergate in this multimedia archive of America's most notorious not-a-crook, Richard Milhous Nixon. You can review Tricky's career; compare historic news footage with scenes from Oliver Stone's fantasy film; and explore thousands of documents, including tape transcripts, photographs, and interviews with influential people in Nixon's life. And no, this CD-ROM is not missing 18½ minutes of content. $39.95. Graphix Zone: 800-828-3838 or 714-833-3838; http://www.gzone.com/.

VOTE AMERICA. Become an informed voter with this guide to the electoral process. Read all about the 1996 presidential candidates — both mainstream and fringe — and rank them by how well they agree with you on major issues. Free monthly updates online let you follow the polls and keep track of who's still in the race. $24.95. Virtual Entertainment: 800-301-9545 or 617-449-7567.

THE CONTRACT. Even the most rock-ribbed right-winger will have a hard time sitting through this compilation of muddy news footage featuring Newt Gingrich and other conservative luminaries discussing the 1994 election, the Contract with America, the Oklahoma City bombing, and other recent disasters. $12.95. Distributed by Educorp: 800-843-9497. Wilmington Studios: http://www.inet.net/contract/. / *CAROLYN BICKFORD*

Life Can Be Fun

ALLOWING LITTLE BEASTS, each with a mind of its own, to run around inside your Mac may sound like a recipe for disaster, but don't be afraid of iNSCAPE's Creatures. Not only are they armed with the Darwinian defense of extreme cuteness but they're also so intelligent — albeit artificially — that you can teach them to behave.

Each gremlinlike Creature has its own complex genetic makeup, which determines how quickly it learns and how instinctively it reacts to its environment. Creatures respond to environmental cues and experience feelings such as boredom, hunger, fear, and pleasure. They have to learn everything from how to eat to how to behave around other Creatures, how to use mechanical equipment, and which poisonous plants to avoid in their virtual world. They'll learn on their own — or suffer the consequences — or you can help them.

When Creatures mate after they reach adolescence, their virtual DNA is passed on to their offspring according to the laws of genetics. With selective breeding, you can emphasize specific characteristics and possibly end up with Creatures considerably different from your original pair. You'll be able to purchase your first furry Adams and Eves this October for $39.95. iNSCAPE: 800-693-3253 or 310-312-5705. / *NANCY PETERSON*

PHOTOGRAPHY / MICHAEL FALCONER

Go through life with less baggage.

Introducing the MessagePad 130 with Newton 2.0.

The farther we go, it seems, the more we're asked to bring with us. The names and numbers of clients past and present. Dates, times, and notes from countless meetings. Not to mention a way to get your e-mail.

The new Apple® MessagePad® 130 was designed to lighten your load by making it easier than ever to schedule work, take notes, send and receive e-mails and faxes — or hop on the Internet — from wherever you happen to be. Even in the dark, thanks to its backlit screen.

http://www.info.apple.com

The Newton 2.0 operating system: learn less, do more. The award-winning Newton® 2.0 provides a surprisingly familiar way of working that encapsulates all you do now in a simpler, more concise form. Instead of loading you with complex commands, Newton works the way you do. It even reads your handwriting.

Dozens of new and well-known applications, such as Now Contact, ACT!, Quicken, CompuServe, Meeting Maker, and Eudora Pro, are available for Newton, with more coming. Making it easy to transfer information to and from your PC.

Connect

Pick up a MessagePad and get going! So put down whatever you're doing, and go see the Apple MessagePad 130 at your nearest dealer. Or get our faxback information kit, with details on the complete line of MessagePad products and the latest software. See just how little you have to carry, to have it all.

To get your information kit, visit our Web site or call Apple today!

http://www.info.apple.com/newton/
1 800 364-0766 ext. 1002

Newton®

Apple®

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ONLINE

HEARD ON THE NET

"Never before in history have nerds, as a class, been economically viable."

— Suck (http://www.suck.com/daily/dynatables/96/06/24/)

Make the Mac Palette-able

TIRED OF LITTERING your desktop or filling up your Apple menu with aliases of your favorite applications? The shareware world offers several easy-to-use program launchers to help you organize your files, folders, URLs, servers, or anything else you want to open in a hurry. Try one, and soon you'll find you're increasing productivity while reducing clutter on your desktop.

A favorite around the *MacUser* offices is Guy Fullerton's **HoverBar** (♦♦♦♦), a flexible, great-looking launcher that's a bargain at $5. You can configure HoverBar's tiles to appear in many different forms. Various keyboard shortcuts let you add or remove items, find the original application, or temporarily hide HoverBar's icon bars. Items can be named or just appear as tiny icons, saving even more space. But HoverBar's coolest feature is the one that gives it its name: HoverBar's palettes float above every other item on your desktop, including document windows.

Trilobyte Software's $25 **PowerBar Pro** (♦♦♦) is a good choice for pre-System 7.5 users or those with older Macs. PowerBar is a control panel that adds a launcher to the Finder, but PowerBar is unique in that it lets you perform other Finder actions — such as moving a file to the Trash, making an alias, and getting information about a file — with just one button click.

James Thomson's free ▼ **DragThing** (♦♦♦♦) stores and launches URLs, servers, folders, files, and applications; sports an intuitive and creative interface; and — since it's a regular application — doesn't modify your system software in any way. DragThing's palettes, or "docks," can even let you organize multiple pages of icons via a tabbed interface. To bring DragThing docks to the foreground, you just move your cursor to a predetermined hot corner. / *JODI NAAS*

TOP OF THE CHARTS

TOP SOFTWARE DOWNLOADS

1. **TechTool** / Rebuilds desktops and zaps PRAM
2. **The DiskTools Collection** / Five productivity enhancers
3. **Maelstrom** / Addictive space shoot-'em-up
4. **Vintage Typewriter** / Old-style font
5. **TattleTech** / Get a full profile of your Mac

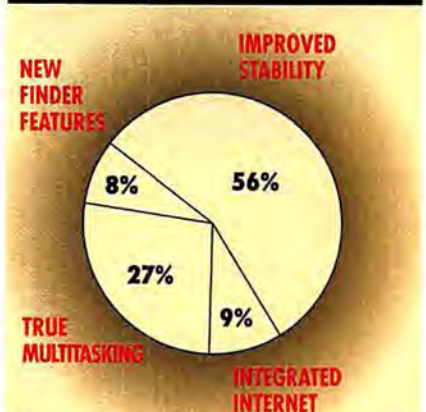
TOP GAME DOWNLOADS

1. **Maelstrom** / Asteroids-style space shoot-'em-up
2. **Alley 19** / Bowling game with great sound
3. **Bolo** / The classic tank-battle game
4. **Realmz** / Full-featured role-playing
5. **Grizzly** / Fight game with a twist: stuffed animals!

Ranking based on download counts from *MacUser*'s Software Central on the Web (http://www.zdnet.com/macuser/software/).

ONLINE POLL

Q. Which feature of Mac OS 8 would you most like to see brought to Harmony, Apple's next System 7 release?



To participate in *MacUser*'s online polls, go to http://www.zdnet.com/macuser/poll.html.

MACUSER UTILITY OF THE MONTH

The Start of Something Now

EVERY MONTH, *MacUser* brings you a free utility you can't find anywhere else online. October's utility of the month, Now Software's Now Startup Manager 7.0, is no exception. Like all past *MacUser* utilities, this $55 commercial utility is available absolutely free from ZD Net on CompuServe (GOZMC:MACUSER), on the Web (http://www.zdnet.com/macuser/software/), and on America Online (keyword: MacUser). There *is* one big difference in this utility, though: It's available only for a limited time, from August 7 through September 15. After September 15, Now Startup Manager will be available only commercially.

Now Startup Manager lets you turn files on and off, whether they're extensions, control panels, Apple menu items, fonts, or even Netscape and Photoshop plug-ins. The program also isolates extension conflicts. And although Now Startup Manager is a commercial product, the version available from *MacUser* is fully functional and will not expire.

MACUSER ONLINE-EVENT CALENDAR

DATE	TIME	EVENT
September 3	9 P.M. EDT	Seybold Preview: Chuck Weger and Bob Schaffel
September 10	9 P.M. EDT	Two Dads: Rik Myslewski and Jim Shatz-Akin
September 19	9 P.M. EDT	Apple's Future: Henry Bortman
September 24	9 P.M. EDT	The Game Room: Roman Loyola

All events will take place on America Online at keyword ROTUNDA. Times and guests are subject to change. For up-to-date event information, check out http://www.zdnet.com/zdi/talk/talkcal.html.

MACUSER ONLINE

Web: http://www.zdnet.com/macuser/
AOL: keyword MACUSER
CompuServe: GO ZMC:MACUSER
Send letters to the editor to letters@macuser.com.
To subscribe to the *MacUser* Web bulletin, e-mail macuserweb@macuser.com, using the subject *subscribe*.

Decisions. Decisions.

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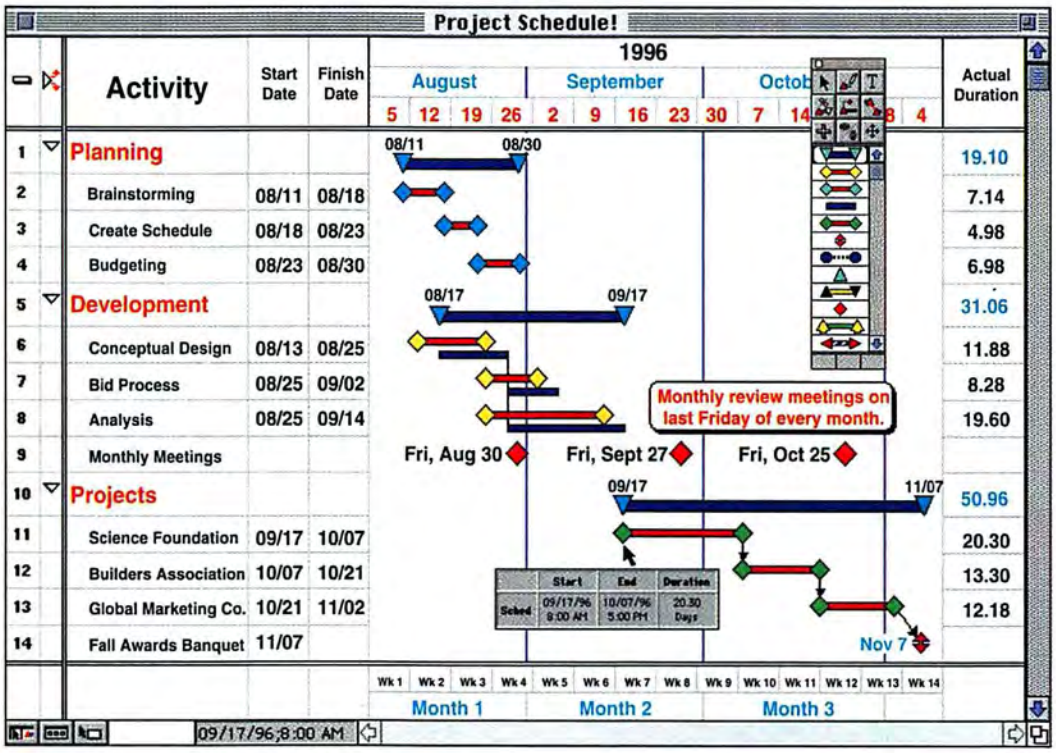

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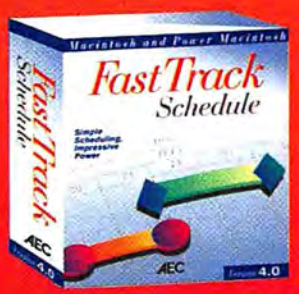

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MacWEEK REPORT

MacUser's Inside Track to Macintosh News

OpenDoc debuts anew as Live Objects at Expo

By Clifford Colby

Apple is putting the finishing touches on its belated coming-out party for OpenDoc. And, as part of the August festivities planned for Macworld Expo in Boston, the user portion of the component architecture will be renamed Live Objects.

"It was important, now that end-user products are becoming available, to have the name of the products define what they are," said Gina Centoni, OpenDoc product line manager. "The Live Objects name is much more descriptive."

But the technology itself will still be called OpenDoc. For example, Cyberdog, Apple's Internet-access tool, will comprise 32 Live Objects created with OpenDoc.

At the expo, Apple intends to unwrap the latest editions of OpenDoc and Cyberdog and unveil its Apple Live Objects suite.

Apple said OpenDoc 1.1 will run faster, require less RAM and include a handful of bug fixes. Cyberdog 1.1 will finally run on 68040-based Macs, but the company is still exploring whether Cyberdog will run on other 680x0 systems. Version 1.1 will work with Netscape Navigator plug-ins, so users will be able to use the Web browser add-ons within Cyberdog and perform Mac LAN tasks such as browsing AppleTalk networks and mounting AppleShare volumes.

Apple Live Objects, which is a bundle of parts previously called KickStart, will debut at the show with OpenDoc text and drawing editors as well as viewers for QuickTime, QuickTime VR and QuickDraw 3D.

The company will also have on hand tools for integrating OpenDoc with other components. In its booth, Apple plans to show a Java-applet viewer, which the company said will provide a wrapper around Java programs so they can run inside OpenDoc components. Apple will also show the Mac version of ComponentGlue, which lets OpenDoc and OLE containers interact, while IBM Corp. of Armonk, N.Y., will demonstrate OpenDoc for Microsoft Windows.

CI Labs will join the party by rolling out its Live Objects Validation software, which tests interoperability. If a component passes, it will be given a CI Labs seal of approval and the right to use the Live Objects label.

An armful of third-party developers will also use the expo to show off their OpenDoc wares:

Adrénaline Software Inc. of Sainte-Foy, Quebec, will unveil its spreadsheet part, Adrénaline Numbers, and its charting part, Adrénaline Charts.

Claris Corp. of Santa Clara, Calif., will show ClarisWorks 5.0 working with Live Objects.

ComGrafix Inc. of Clearwater, Fla., will debut GeoInsight, a set of Geographic Information System OpenDoc parts that will let users associate data with maps.

Corda Technologies Inc. of Highland, Utah, plans to ship table-editing and graphing parts.

Corel Corp. of Ottowa will demonstrate an OpenDoc container version of its WordPerfect software.

Digital Harbor of Lindon, Utah, plans to ship Wav, its OpenDoc-based word processing application, formerly code-named Opal.

dtF Americas Inc. of Cupertino, Calif., said it will ship its dtF Database Toolkit, a suite of OpenDoc parts for linking applications with databases.

MetaMind Software Inc. of Mill Valley, Calif., will release at the expo a free stripped-down version of its Page Composer page-layout program, which is an OpenDoc container.

Spyglass Inc. of Naperville, Ill., will show its large collection of Internet-client parts.

SoftLinc Inc. of Marco Island, Fla., will roll out Lexi, its suite of word processing tools.

Worldsoft Corp. of Saratoga, Calif., will debut the OpenDoc version of WorldWrite. □

Executive plan outlines new Apple focus

By David Morgenstern

With an eye toward the future, Apple is firming up its new corporate strategy. Building on themes recently expressed by top management, an internal company plan reportedly creates a "strategic framework" for markets and product development.

According to sources familiar with the document, the Apple executive white paper now being circulated presents a sobering view of the company's situation, stresses value and quality for its future hardware and software products, seeks to improve compatibility with Windows applications, and targets certain key market segments and geographical regions while "sustaining" others.

In the document, management admits that Apple has rested on its laurels. "We must stop taking for granted that our products excel in ease of use, especially in an era when the competition has made enormous strides in this same direction," said a source quoting from the plan. Apple has also re-evaluated the computer market now that the dust has settled following the release of Windows 95 last year.

"While we are accustomed to regarding our products as superior in a number of ways to Wintel machines, we must face the fact that for many routine tasks in the hands of routine users, the two types of personal computers have become largely indistinguishable," wrote the document's authors.

Executives said Apple will seek to identify tasks for which it can offer "distinctly superior user value." The company will then target specific markets that it believes will pay more for this added value.

This strategy marks a retreat from Apple's previous attempts to gain greater market share. Instead, Apple executives recently said, the company will stress increasing profits and distinguishing its products, rather than seeking to expand in commodity markets.

At a recent briefing in New York, Apple Chief Operating Officer Marco Landi said the company will measure every hardware and software product by its contribution to the bottom line. "Our entire structure will push profit," he said. □

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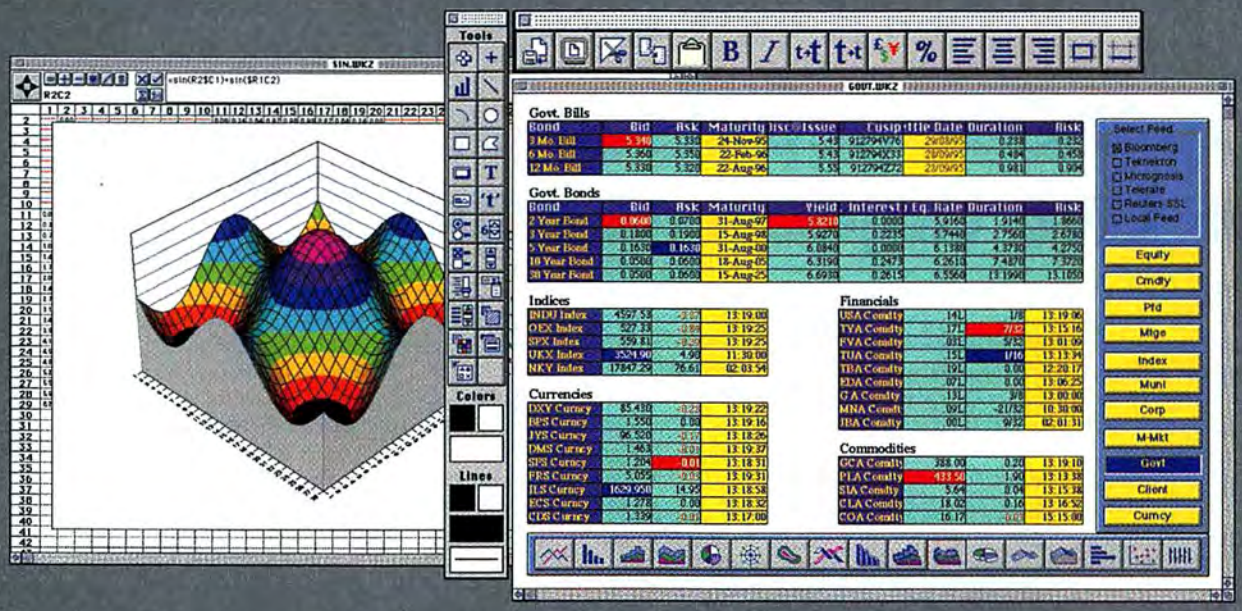

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CIRCLE **128** ON READER SERVICE CARD

Hackers hack new wish list

By Clifford Colby

Dearborn, Mich. — Attendees of this year's MacHack conference again produced a list of what they consider to be significant issues and concerns about the Mac platform.

The 11th-annual MacHack, billed as a technical conference for leading-edge developers, drew close to 300 of the Mac industry's sharpest engineers last month. And for the second year, the hackers produced a wish list, which was a distillation of the conference's marathon Bash Apple session.

The top request was for Apple to encourage academic and hobby developers. The group requested that Apple view colleges and universities as training grounds and support students with systems, tools and documentation.

Next, the group asked Apple to use a straightforward version-numbering scheme and assign each new system software component a higher number. Also on the list: that Apple provide in System 7 APIs from Mac OS 8. Attendees said that the backwardly compatible APIs would ease the transition to Apple's next operating system.

The group repeated a request from last year: Let developers purchase high-end machines at less-than-market prices.

Developers at the conference asked Apple to improve the quality of its hardware. Attendees also said they appreciated Game Sprockets, a new suite of game APIs, and asked for Sprockets for such things as communications, text, Apple events and the Internet.

Attendees said giving users the option of installing essential resources discouraged adoption, and they asked that Apple increase the installed base of key new Apple technologies. They also said that one of the barriers to adoption of new technologies is bad APIs and asked Apple to improve the quality of APIs across the board.

Next on the list was a request for Apple to give developers access to Radar, the company's internal system for tracking bugs.

The developers asked Apple to revive its Cool Tools awards, which were given to developers and their Internet tools.

Attendees requested that Apple recognize and reward developers who do Mac-first and Mac-only development. Another request was from Pascal users, who asked Apple to give them Pascal APIs.

Finally, conferees said Apple should drive the adoption of its technologies by delivering them across platforms. □

HTML 3.2 proposals extend design options

By Tonya Engst

The World Wide Web Consortium recently announced HTML Version 3.2, which adds a collection of popular Web page tags, including those for tables, attaching Java applets and designating colors by name rather than hexadecimal number. Yet the new version is far from being a standard.

As a matter of fact, HTML 2.0, which has been widely adopted by the industry, is only a proposed standard and is not expected to be finalized until later this year. HTML 3.2 is just now starting the public comment phase, in which organizations can propose additions to the standard. By the time it reaches final form, sometime in 1997, it may be completely different.

For example, Webmasters cited two gaping omissions in the standard: frames and style sheets. "Not to have frames in it is just stupid," said Brad Schrick, a Mac Internet consultant based in Palo Alto, Calif. He said he expects the World Wide Web Consortium, or W3C, to adopt specifications for these before the standard is finalized.

The Internet Engineering Task Force (IETF), based at The Corporation for National Research Initiatives in Reston, Va., and the W3C, based at the Massachusetts Institute of Technology in Cambridge, are also working on additions that will likely be part of the specification. W3C has proposed an object tag that would standardize the insertion of plug-in and Java-related elements on a page. IETF currently has a proposal for a tag that would enable file uploads through a form.

An enhancement to the set of tags for HTML tables is also on the drawing board. It would provide the ability to group columns and have table text scroll between a fixed header and footer.

A number of companies are also contributing their ideas. Adobe, Apple and several other companies have come together to propose OpenType, a font technology that will let designers embed both PostScript Type 1 and TrueType fonts into a page.

Despite the progress being made to improve the standard, Webmasters still contend that the best way to ensure a page looks right in all browsers is by sticking to HTML 2.0.

Version 2.0, however, precedes the wide range of HTML extensions supported in Netscape Navigator and Microsoft Internet Explorer. As standards develop, and developers implement new tags in browsers and authoring tools, Webmasters need guidelines for tags to use now. They must balance the desire to be on the cutting edge with the importance of delivering a clear message.

Chuq Von Rospach, Apple solutions marketing Webmaster, said that about 75 percent of his users run Netscape Navigator; hence he uses HTML 2.0 tags that will work in any browser, along with a smattering of Navigator extensions that won't cause display problems in other browsers. He said he plans to use tables more extensively in the near future. □

HTML 3.2 and beyond

IN THE SPECIFICATION	PROPOSED ADDITIONS
Tables	Frames
Java applet support	Style sheets
Color by name	OpenType
Text wrap around images	Object tags
Superscript and subscript	Encapsulated PDF
	Enhanced tables
	Content ratings

Mac users most loyal

By the MacWEEK staff

Mac users are the most loyal personal computer users, a survey revealed last month.

The report by Computer Intelligence InfoCorp, a research firm in La Jolla, Calif., found that 87 percent of Mac owners who bought a new machine last year chose another Mac.

Behind Apple were Dell Computer Corp. with 74 percent brand loyalty, Hewlett-Packard Co. with 72 percent, Acer Inc. with 68 percent and Gateway 2000 Inc. with 66 percent.

David Tremblay, senior industry analyst at CII, said Apple's loyalty was based on the Mac OS rather than software-compatibility issues. But Tremblay added that software compatibility was the major reason Intel-standard PC users don't change to the Mac. "Once you've made a commitment to the Wintel world you're unlikely to switch, no matter how much you like the Mac." □

4:45 PM Sending my 48 meg file to be printed.
Color calibrating? Three clicks, all done.
Traps and overprints? They all showed up.
Revisions? OK, so I'm a little obsessive.
The comp? It actually matches the screen.

5:00 PM "What's next? I'm out of here."

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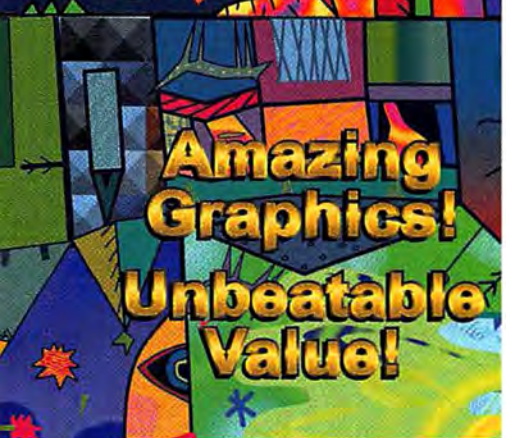

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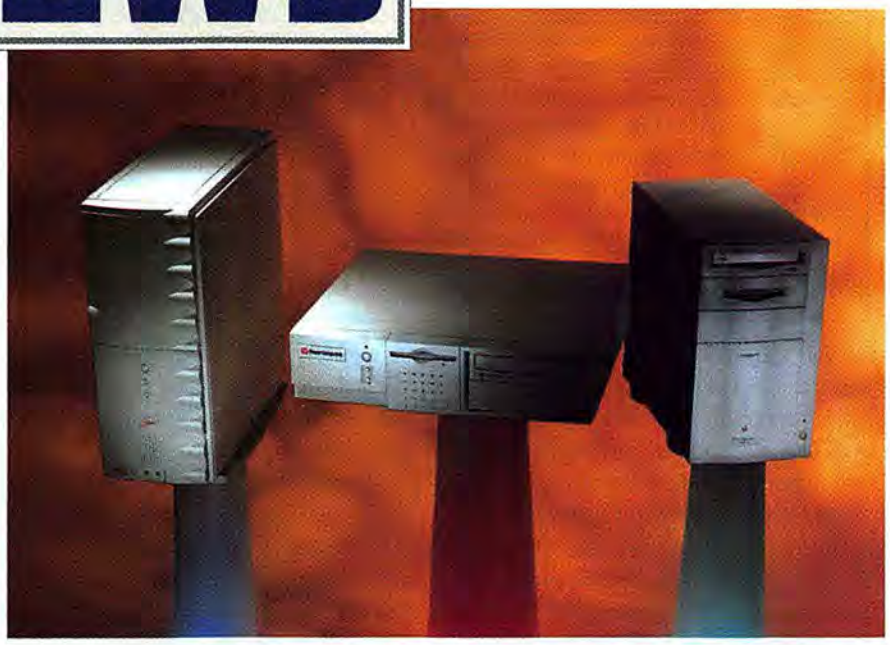
CIRCLE **77** ON READER SERVICE CARD

REVIEWS

Special Report: Systems for Home and Office Scream Past 200 MHz

Apple, DayStar, Power, and UMAX throttle up fast new systems.



AUTUMN'S FAST APPROACHING, and along with back-to-school shopping and falling leaves, that means its time to harvest Apples — and clones as well. New and enhanced Mac OS systems are arriving faster than ever. Apple has a bumper crop — including its first ever multiprocessing computer, the Power Mac 9500/180MP. Power Computing, meanwhile, seems to come up with a new clone family every month or two, and even DayStar Digital and UMAX are adding new systems to their previously limited lines.

This abundance of products poses a challenge for users. It's difficult enough to keep the names and configurations straight, but it's also getting harder to ascertain how much bang for the buck each system offers. Looking at megahertz alone won't tell you what you want to know: This season's models incorporate four variants of the PowerPC processor — the 601, 603e, 604, and 604e — each of which has a different performance profile. All other things being equal, a 120-MHz 603e, for example, edges out a 120-MHz 601, but a 120-MHz 604 smokes them both.

Of course, other things are only rarely equal: The new systems differ in cache configuration (which makes for a surprisingly — and increasingly — large difference in overall speed), system-bus speed, and other logic-board details — not to mention traditional but still critical issues such as hard-drive and graphics-subsystem performance.

How then to steer through this roiling sea? Let MacBench 3.0 be your guide — its tests are the best approximation of the performance you can expect to encounter in the applications you use every day. In these pages, we present the results of MacUser Labs' tests on the latest systems, along with our analysis of their principal features. For more details on some of the most interesting new entries, see our recent coverage of Power Computing's PowerTower Pro series (September '96, page 37) and Apple's Power Mac 5400 (August '96, page 76) and Performa 6400 ("Star Performa," in this issue).

The single biggest factor in the season's new crop of Mac OS machines is the arrival of the PowerPC 604e. Offering higher clock speeds, larger internal caches, and support for a wider range of system-bus speeds, it has enabled vendors to deliver unprecedented performance. Power Computing started it all with its PowerTower Pro line. UMAX joined the fray with its 150-MHz S900 and is now rolling out a 200-MHz version. Finally, Apple is adding the 604e to its line: In addition to the dual-processor Power Mac 9500/180MP, the company will offer the 9500/200, a six-slot system with a single 200-MHz 604e, and the 8500/180, a version of its three-slot, AV-capable minitower with a 180-MHz 604e. Both Apple systems ship in two configurations, with 2-GB drives and 16 and 32 MB of RAM, respectively.

The original PowerPC 604 isn't going away quite yet, though: Apple will continue to use a 150-MHz version in one configuration of the Power Macintosh 8500, and in the 7600, a 132-MHz 604 replaces the 120-MHz version shipping since April. Likewise, Power Computing will continue using the 604 in its PowerTower 166 and in the two surviving configurations (150 and 132 MHz) of its midrange PowerCenter series.

But Wait, There's More

Faster processors are not the only improvement in this summer's crop of PowerPC systems. Apple (again following a lead set by Power Computing) has upgraded all of its internal CD-ROM drives to the 8x level, doubling the transfer rate to 1.2 MB per second. Few games or multimedia discs take advantage of the increased speed yet, but you'll notice the difference whenever you copy or install from CD-ROM.

Furthermore, Apple has finally stopped shipping business Macs without a Level 2 cache, dropping the cacheless version of its Power Mac 7200/120. The standard 7200 configuration will now be a $1,999

REVIEWS RATING KEY	
★★★★★	OUTSTANDING
★★★★	VERY GOOD
★★★	ACCEPTABLE
★★	POOR
★	SERIOUSLY FLAWED
💣	DANGEROUS

PHOTOGRAPHY / MICHAEL FALCONER

ON THE HOME FRONT / comparing new entry-level systems

	APPLE PERFORMA 6400/200*	ADVANTAGE	POWER COMPUTING POWERBASE 200
Speed	Hard drive beats Power's, but slow video and undercached CPU limit zippiness.	▶	Fast PowerPC 603e processor runs full-tilt, thanks to the 256K L2 cache.
Price	At $2,799, Apple's peachiest Performa costs $900 more than Power's faster rival.	▶	$1,795 system performs on a par with Apple's business-class 7600.
Versatility	Apple TV tuner, video module, and built-in modem are painless (if low-end) add-ons.	◀ ▶	Options galore: Upgrade CPU, L2 cache, or graphics; add PC keyboard.
Software	Great kids' CD-ROMs, plus organizational tools for home, make ideal family bundle.	◀	Terrific home-productivity package offers little for youngsters.
Multimedia	Avid card, with elegantly simple software, works easily with Apple video-in module.	◀ ▶	MiroMOTION card offers higher quality, but Adobe software is daunting.

*For details on this system, see "Star Performa," in this issue.

version with 16 MB of RAM, a 1.2-GB hard drive, an 8x CD-ROM drive, and a 256K secondary cache. A version with the same hardware plus a PC Compatibility Card sporting a 100-MHz Cyrix 586 processor and 8 additional MB of RAM will be $2,699.

Apple's L2 caches, however, are only half the size of those in many competing Power Computing models: the PowerTower Pro models, for instance, ship with a 1-MB cache DIMM, compared to a 512K L2-cache chip soldered into Apple's 9500s and UMAX's S900s, whereas the original PowerTower has 512K cache DIMMs, as against the 256K cache DIMMs Apple provides in the Power Mac 7200, 7600, and 8500. In older Macs, caches larger than 256K tended to make minimal contributions to speed, but with CPU speeds accelerating much faster than DRAM speed, the value of caching keeps increasing: The 200-MHz PowerTower Pro outperforms Apple's 9500/200 by fully 13 percent, thanks to the former's larger cache.

MP Moves Toward the Mainstream

While the 604e is enabling single-processor business and graphics systems to push the speed envelope, it's also causing a stir in the multiprocessing (MP) arena — at the peak of the performance and price ladder. Until now, Macintosh-compatible systems with multiple processors have been available from only one vendor — DayStar Digital — and prices for the company's Genesis MP boxes have ranged from around $6,000 to nearly $11,000 — and that's without memory, storage, or a video card! Prices are sure to trend lower now that Apple and DayStar, partners in the MP arena, are also competitors: Both companies have MP systems based on a card containing dual 180-MHz PowerPC 604e chips. We tested both systems — DayStar's $5,800 Genesis MP 360+ and Apple's Power Mac 9500/180MP. As expected, both machines fared well on our computationally intensive Adobe Photoshop tasks, although the DayStar system lagged marginally behind the Apple one, perhaps owing to hard-drive performance. Although this speed difference is negligible, the extra $400 DayStar charges for its driveless, RAM-less box over an Apple system with 32 MB of RAM and a 2-GB drive gives Apple's MP system a clear price/performance edge. DayStar will be pushing the performance part of that equation hard later this year, however, with the MP 720+, offering four 180-MHz 604e chips, and the MP 400+ and 800+, offering two and four 200-MHz 604e chips, respectively. Still, DayStar has to consider lowering prices — at least where it competes with Apple.

DayStar is also selling its dual-180-MHz-processor card as the nPOWER MP 360+, a $2,399 upgrade for Macs and compatibles with processor daughtercards. We installed one in an Apple Power Mac 9500/150 and, predictably, got speed on a par with that of the 9500/180 MP and the Genesis MP 360+. It's impressive but expensive — unless your Mac is devoted primarily to tasks that take optimum advantage of MP.

A New Baseline

If you're looking to get in on the latest advances in PowerPC technology but your budget balks at the price of 604e-based systems (much less MP machines), this summer's most interesting new offerings may be those in Power Computing's new entry-level PowerBase series. Scheduled to ship in early September, the new models combine blazing new 603e processors with a 256K Level 2 cache, 16 MB of DRAM, a 1.2-GB IDE hard drive, and an 8x CD-ROM drive. The 180-MHz PowerBase 180 will cost only $1,495, including

FACTS AND SPECS / features and speed data on the latest Mac OS systems

PowerPC 604e and 603e processors running at clock speeds well beyond 180 MHz — coupled with differences in Level 2 cache, installed RAM, and graphics and storage subsystems — make it hard to use system specification to gauge speed. To see how system configuration relates to speed, consult this features table, along with the scores on our industry-standard MacBench speed tests. MacBench scores are relative to those of an Apple Power Mac 6100/60 with an internal 250-MB hard-disk drive and an internal 2x CD-ROM drive, which is assigned a score of 10.0 on all tests. Products are grouped by PowerPC chip type, in decreasing clock-speed order; products with identical processors and clock speeds are listed alphabetically.

	Price as Tested	RAM	Hard-Drive Capacity	PowerPC Chip Type	CPU Clock Speed	Level 2 Cache	Number of PCI Slots
Apple Power Mac 9500/200	$4,399	32 MB	2 GB	604e	200 MHz	512K	6
UMAX SuperMac S900 604/200	$4,999*	16 MB	2 GB	604e	200 MHz	512K	6
Apple Power Mac 8500/180	$3,999	32 MB	2 GB	604e	180 MHz	256K	3
Apple Power Mac 7600/132	$2,699	16 MB	1.2 GB	604	132 MHz	256K	3
Power Computing PowerBase 240	$2,195	16 MB	1.2 GB	603e	240 MHz	256K	3
Apple Performa 6400/200	$2,799	16 MB	1.6 GB	603e	200 MHz	256K	2
Power Computing PowerBase 200	$1,795	16 MB	1.2 GB	603e	200 MHz	256K	3
Apple Performa 6400/180	$2,399	16 MB	1.6 GB	603e	180 MHz	none	2
Power Computing PowerBase 180	$1,495	16 MB	1.2 GB	603e	180 MHz	256K	3
REFERENCE SYSTEM							
Apple Power Mac 9500/150	$4,365	16 MB	2 GB	604e	150 MHz	512K	6

*Preliminary pricing, subject to change.

keyboard; the 200-MHz PowerBase 200 will be $1,795; and the 240-MHz PowerBase 240 will be $2,195.

The PowerBase machines are based on the Alchemy architecture, which Apple uses in its education-oriented Power Mac 5400 and the new Performa 6400 (see "Star Performa," in this issue.) But Power Computing's engineers made many significant changes in the design, eliminating some features Apple includes but giving customers much greater flexibility and performance on the whole.

In the first place, the PowerBase CPU is on a small removable daughtercard, so users will eventually be able to upgrade their processor without replacing anything else; Apple's 5400 and 6400 have soldered-on CPUs, so upgrades will require new logic boards. Power also put three DRAM DIMM sockets onto its boards, compared to the two on Apple's Alchemy systems. (In both cases, the systems ordinarily ship with one socket filled.)

Second, the PowerBase features a significantly more capable and expandable graphics system than the 5400 and 6400. In its standard configuration, the PowerBase supports millions of colors (24-bit color) at resolutions of up to 832 x 624 pixels; thousands of colors (16-bit color) at up to 1,152 x 870 pixels, and 256 colors (8-bit color) at up to 1,280 x 1,024 pixels. Apple's Performa 6400 doesn't deliver true color at any resolution, and it's limited to 8 bits on large screens. And whereas the 6400's graphics system cannot be expanded, the PowerBase allows you to add 2 MB of RAM for video to the 2 MB already onboard; with 4 MB, the system delivers 24-bit color at up to 1,152 x 870 pixels and 16-bit color at even higher resolutions.

In addition, PowerBase graphics are much faster, because Power Computing dropped Apple's Valkyrie graphics controller in favor of a speedier chip from ATI Technology. In fact, even the slowest PowerBase configuration outperformed Apple's Power Macintosh 8500/180 in MacBench's Graphics Mix test.

Best of all, the whole graphics subsystem is upgradable: It is located on the riser that holds PCI cards, an inexpensive and easy-to-replace component, so users and Power Computing will be able to easily install replacements with, for example, built-in 3-D acceleration or MPEG support. All three PowerBase systems also surpass the Performa 6400s in MacBench's Processor test. That's partly explained by the PowerBase systems' inclusion of a 256K Level 2 cache; in the 180-MHz Performa 6400, it's an extra-cost option.

But if you compare the processing speed of the PowerBase 200 to that of the 6400/200 — both have 200-MHz 603e chips and 256K of L2 cache — the Power system wins. Power attributed the higher scores to an improved version of the Alchemy memory controller. The new version also adds support for EDO (Extended Data Out) RAM, a type of high-speed memory now widely used on Pentium PCs.

Speaking of PC standards, the PowerBase

PROFESSIONAL BUSINESS SYSTEMS

Apple Power Mac 9500/200	4½
UMAX SuperMac S900 604/200	3½
Apple Power Mac 8500/180	3½
Apple Power Mac 7600/132	3

ENTRY-LEVEL SYSTEMS

Power Computing PowerBase 240	5
Power Computing PowerBase 180	5
Power Computing PowerBase 200	4½
Apple Performa 6400/200	3½
Apple Performa 6400/180	3½

MULTIPROCESSOR SYSTEMS

Apple Power Mac 9500/180MP	4½
DayStar Genesis MP 360+	3½
DayStar nPOWER MP 360+ card	3

MACBENCH 3.0 SCORES

Processor	Floating Point	Disk Mix	Publishing Disk Mix	Graphics Mix	Publishing Graphics Mix	CD-ROM Mix
41.4	43.7	25.4	17.4	66.7	48.5	23.3
41.5	44.0	31.8	18.3	86.7	81.8	38.7
33.7	39.5	27.1	16.6	33.8	30.1	23.2
25.9	26.7	26.8	16.7	27.3	22.2	22.2
32.9	37.1	17.6	15.4	38.5	29.5	38.5
27.5	31.2	24.5	16.0	18.9	14.6	Not tested.
30.4	31.5	17.1	15.3	37.1	29.4	38.5
19.3	24.5	19.5	14.3	13.6	11.4	Not tested.
28.8	28.6	17.1	15.2	35.9	28.5	38.5
31.9	29.7	30.9	17.5	47.2	36.2	16.9
SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER	SCORE BETTER

Twin-powered towers, the DayStar Genesis MP 360+ and the Apple Power Mac 9500/180MP both feature dual 180-MHz PowerPC 604e processors.

provides a VGA connector for standard PC monitors, and — a first for any shipping Mac OS-compatible system — a connector for PS/2-style keyboards. It also offers more choice in industrial design: It will be available in both a low-profile desktop version and in a minitower; the desktop design leaves no empty bays for additional storage devices, but the minitower has two free 5.25-inch bays, compared to only one in the Performa 6400.

Finally, Power Computing has placed all its bets on PCI for system expansion. The PowerBase lacks the 5400 and 6400's Comm Slot II (for a modem or Ethernet), the separate slot for the Apple Video System digitizing card, and the TV-tuner bay — all of which were derived from earlier Performa and LC technologies but were not based on industry standards.

In exchange, the PowerBase provides three PCI slots with room for full-sized (12-inch) cards, not just the 7-inch variety supported in the one-slot Power Macintosh 5400 and the two-slot Performa 6400. And Power Computing will offer PCI products to compete with Apple's options. Of particular interest is Power's answer to Apple's Avid Cinema card (see "Star Performa," in this issue): an AV bundle that combines Miro's miroMOTION DC20 video-capture card with limited editions of Adobe Premiere and Photoshop. The bundle adds a modest $599 to the cost of a new Power Computing system — roughly the combined cost of Apple's Avid Cinema card and the Apple Video System it requires in a Performa 6400 — and although the Adobe software isn't as easy to use as Apple's, the Miro card significantly outperforms Apple's hardware, capturing a true 640 x 480 pixels, rather than only 320 x 240, at 30 frames per second.

The one area in which PowerBase performance fell a little short in our tests was in MacBench's Disk Mix test: The 5.25-inch Quantum BigFoot drive Power Computing uses in the PowerBase machines trailed not only the SCSI drive in the Apple Power Macintosh 7600 models but also the drives we've tested in the Performa 6400 as well as most other recent Apple systems.

Still, considering its numerous technical advantages and aggressive pricing and Power Computing's usual bundle of first-rate software, the PowerBase looks like a much better buy than Apple's 5400 and 6400 systems. In fact, the new line could even present a serious challenge to Apple's 7200 and even 7600 sales: The 603 family hasn't previously been considered powerful enough for business desktops, but that assumption is going to be hard to justify when buyers get a look at the price and performance of the PowerBase.

The Bottom Line

From top to bottom, this season's new models amount to a revolution in Mac OS performance, and there's no indication that the pace of change in the Mac OS hardware market is about to slow down. All in all, the promise of Mac OS licensing is finally producing the results we've all long hoped for. In terms of system price, performance, innovation, and selection, there's never been a better time to buy. / Henry Norr

Apple Power Macintosh 9500/180MP, $5,399; **Power Macintosh 9500/200,** $4,399; **Power Macintosh 8500/180,** $3,999; **Power Macintosh 7600/132,** $2,699 (list). **Company:** Apple Computer, Cupertino, CA; 800-776-2333 or 408-996-1010; http://www.apple.com/. **Reader Service:** Circle #401.

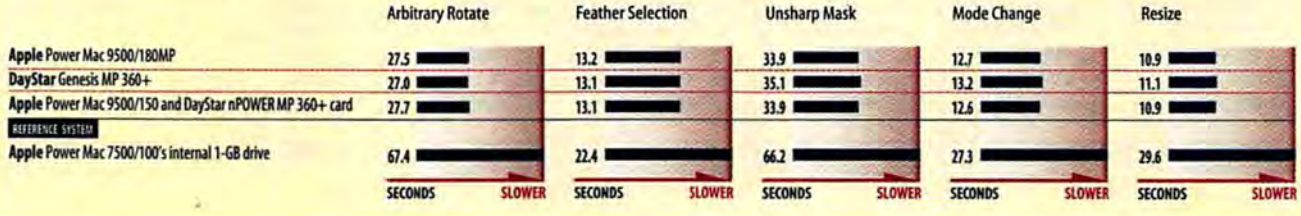
DayStar Genesis MP 360+, $5,791; **nPOWER MP 360+ upgrade card,** $2,399 (list). **Company:** DayStar Digital, Flowery Branch, GA; 800-962-2077 or 770-967-2077; http://www.daystar.com/. **Reader Service:** Circle #402.

Power Computing PowerBase 240, $2,195; **PowerBase 200,** $1,795; **PowerBase 180,** $1,495 (direct). **Company:** Power Computing, Round Rock, TX; 800-370-7693 or 512-246-7807; http://www.powercc.com/. **Reader Service:** Circle #403.

UMAX SuperMac S900 604/200, $4,999 (list). **Company:** UMAX Computing, Fremont, CA; 800-232-8629 or 510-226-6886; http://www.supermac.com/. **Reader Service:** Circle #404.

FAST-FORWARDING PHOTOSHOP / MP speeds computational tasks

To gauge the potential speed boost provided by the new dual-180-MHz-604e multiprocessing systems from Apple and DayStar, we timed them on five computation-intensive tasks, using a 50-MB image created in Adobe Photoshop 3.0.5, and compared the results with those of an Apple Power Mac 9500/150. The tasks included rotating the image clockwise 0.3 degrees, feathering a selected portion of the image, applying the Unsharp Mask filter at a setting of 2.3 pixels, changing the mode from RGB to CMYK, and resizing the image to 50 percent. All systems were loaded with 256 MB of RAM, and Photoshop was allocated 91 MB of RAM.



PHOTOGRAPHY / MICHAEL FALCONER

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SyQuest EZFlyer 230MB

$$$

SyQuest unveils new design, higher-capacity drive.

SYQUEST'S NEW EZFlyer 230MB, a 230-MB removable-cartridge drive, suffers from a kind of identity crisis. It offers much-higher capacity than its less expensive predecessor, the 135-MB SyQuest EZ135, but no speed benefit. It's too slow for digital-audio and -video recording, but it's faster and more capacious than Iomega's runaway-hit Zip 100 drive — but too expensive to get in on Zip's cheap-storage-for-all buzz. Despite its apparent predicament of solving a problem few people really have, the EZFlyer brings some welcome new developments to SyQuest removable-drive technology. It also does some very stupid things.

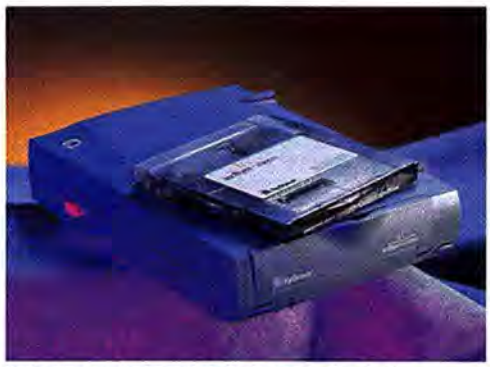
The EZFlyer 230's case is sleek and curvy — a pleasant departure from the nondescript boxiness of SyQuest's earlier designs. Users of older SyQuest drives, including the recent-vintage EZ135, will be pleased to see that the manual-eject lever that marked those drives has been replaced with an eject button that pops the cartridge out from behind a protective plastic door. A set of rubber legs on the side of the case invites you to position the drive vertically, but the manual practically insists that you shouldn't do so — unless you wedge the drive between items to secure it.

The EZFlyer 230MB's cartridges look just like those of SyQuest's earlier 3.5-inch-cartridge mechanisms, the 3270 (270-MB capacity) and the EZ135 (135-MB capacity). The drive, which can read, write, and format EZ135 cartridges as well as its own 230-MB variety, comes with one cartridge. Additional disks are priced at $29.95 each (list). That's a slightly better per-megabyte cost than that of Iomega's 100-MB Zip cartridges.

The formatting software provided with the EZFlyer, La Cie's Silverlining Lite, is straightforward, if limited. It doesn't let you create partitions on an EZFlyer cartridge, nor does it give you the option of turning on write verification, a safety measure that significantly reduces drive speed when you're copying data to a cartridge. The formatter ships on a DOS-formatted floppy, so you'll need PC Exchange or another utility that lets you read PC diskettes in order to access it.

Connecting the EZFlyer 230MB to your Mac is easy, thanks to the drive's two 25-pin SCSI connectors and an included cable. Hitch up to the connector marked "A" if the EZFlyer is the last — or only— device in your SCSI chain, and the drive supplies automatic termination; extend the chain from connector "B," and termination shuts off. Smart.

Less brilliant is the way EZFlyer handles SCSI IDs. Resetting the drive's factory-preset ID of 4 requires you to hold the drive's Eject and Power buttons down simultaneously for 5 seconds and then tap out the desired ID number on the Eject button. Not exactly an intuitive procedure.



A sleek new industrial design sets the EZFlyer 230MB apart from its boxier SyQuest forebears.

Although this feature is inconvenient, the EZFlyer's approach to write protection is downright dangerous: Like their look-alike ancestors, the 3.5-inch SyQuest 270-MB and EZ135 cartridges, EZFlyer cartridges have a floppylike slider that can be moved into a "read only" position — ostensibly to prevent accidental overwriting of stored data. But the EZFlyer 230 drive doesn't recognize the slider. The only way to write-protect an EZFlyer cartridge (or turn off write protection) is with a software utility. This poses significant dangers, particularly to disks from EZ135 drives: Cartridges that are slider-protected in an EZ135 drive — which doesn't require or ship with the protection software — will be vulnerable in an EZFlyer drive.

When it comes to speed, the EZFlyer 230MB turns out to be no improvement over the EZ135. As a matter of fact, it scored marginally lower than the EZ135 on our MacBench Disk Mix and Publishing Disk Mix tests. When reading from and writing to an EZ135 cartridge, the EZFlyer slows to less than two-thirds of the speed seen by the EZ135 cartridge in an EZ135 drive.

The Bottom Line

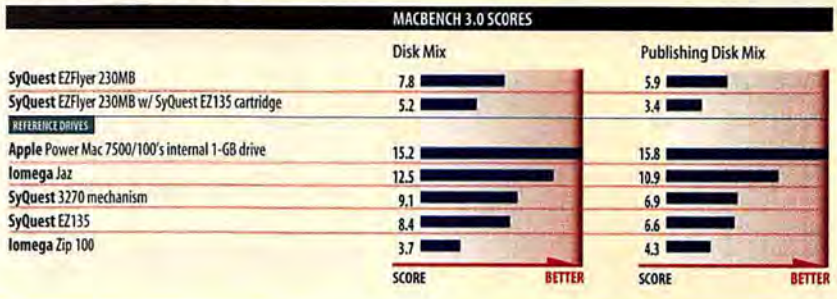
The EZFlyer 230MB is considerably faster than Iomega's Zip and is therefore a much better option for running programs such as games. But like SyQuest's EZ135 drive, the EZFlyer 230MB is too slow for throughput-critical data such as digital video or audio. For that, your only current removable-storage option is Iomega's Jaz — at least until SyQuest rolls out its long-promised SyJET 1.3-GB drive.

If you need affordable, reasonably speedy storage *specifically for files or folders in the 135-MB-to-230-MB size range*, the EZFlyer 230MB is for you. If your files are smaller than that, save yourself $100 or more by buying an EZ135 drive instead. / Jim Shatz-Akin

SyQuest EZFlyer 230MB, $299.95 (list). **Company:** SyQuest, Fremont, CA; 800-245-2278 or 510-226-4000; http://www.syquest.com/. **Reader Service:** Circle #405.

SPEED-LIMITED / the EZFlyer raises capacity, not throughput

Our industry-standard MacBench 3.0 tests indicate that the new SyQuest EZFlyer 230MB is no faster than its lower-capacity predecessor, the EZ135 drive. The MacBench Disk Mix test measures the speed of data transfers such as those required by popular business-productivity applications; the Publishing Disk Mix test measures speed on operations used in popular desktop-publishing and graphics programs. MacBench 3.0 scores are relative to those of an Apple Power Mac 6100/60 with a 250-MB internal hard drive, which is assigned a score of 10.0 on all tests.



PHOTOGRAPHY / TOM UPTON

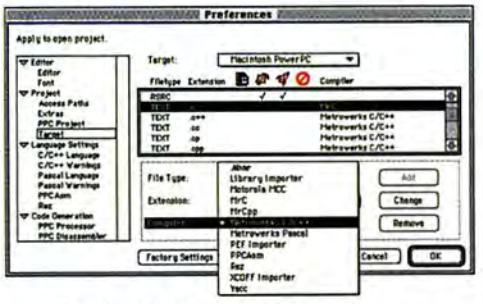
Programming Environments

CodeWarrior 9 ★★★★½

Symantec C++ for Power Macintosh Version 8 Release 5 ★★★★

Development-tool rivalry heats up, and programmers benefit.

NOT VERY MANY PEOPLE care about development tools, but those who do care deeply. To programmers, these are the tools of the trade and they matter a great deal. The most-recent upgrades, Symantec C++ for Power Macintosh Version 8 Release 5 (C++ 8r5) and Metrowerks' CodeWarrior 9 (CW9), to the two leading Mac programming tools bring significant improvements to tools that are both indispensable in their own way.



The plug-in scheme of Metrowerks' CodeWarrior 9 allows you to select different compilers from within the development environment.

The $399-per-year subscription to CodeWarrior Gold offers three updates of usually two CD-ROMs each. CodeWarrior 9 includes a CD-ROM filled with tools and one containing primarily documentation and reference material. The tools include C, C++, and Pascal compilers for 680x0 and PowerPC code, as well as a full suite of Java development tools. The Metrowerks debugger allows source- and assembly-level debugging of all these languages on both 680x0 and PowerPC systems.

The focus of activity within CodeWarrior is its interactive development environment (IDE). In the IDE, you combine source and resource files into projects and then compile those into runnable software. In an annoying carryover from earlier versions, CW9's IDE still allows only one project to be open at a

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-MacUser, August 1996

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BBEdit Works Well with Others

BBEdit also works well with other applications and environments. BBEdit is AppleScript® savvy, and is fully integrated with Frontier 4.0 to perform an array of powerful web-authoring tasks. BBEdit includes tools to check your HTML syntax, so you can use it to proofread code generated by graphical HTML applications. BBEdit is also easily expanded to support new HTML conventions as they hit the scene.

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Symantec's Project Manager lets the same project be used to build programs in 680x0 as well as PowerPC code.

time, and a single project can build a binary for only a particular platform. This means that if you want to create a Fat Binary application, containing both 680x0 and PowerPC code, you must switch from one project to another midway through the compiling process, even though you're building just one application.

The core compilers and linkers provided as part of CodeWarrior are fast and produce good code. However, CW9 doesn't confine you to Metrowerks' compilers. A plug-in API allows third parties to provide compilers that work within the IDE as if they were built in. Plug-ins can replace CW9's standard C/C++ compilers, or they can perform specialized tasks such as compiling Balloon Help. Two add-on compilers are already available for the CodeWarrior environment: Apple's MrC compiler and Motorola's DR 3.0 version of its optimizing C and C++ compilers.

CodeWarrior 9 contains a slew of other tools, including most of Apple's MPW (Macintosh Programmers Workshop) environment. You also get Metrowerks' own fast compilers and linkers in the form of tools that can be used within MPW. Metrowerks' PowerPlant C++ class library is also part of the package, as is a brand-new set of standard C libraries, in source-code form. More-esoteric offerings include C/C++ compilers that generate x86 code, allowing CW9 users to create Windows apps on their Power Macs.

Symantec C++ 8r5 encompasses the Symantec Project Manager (SPM) IDE, Symantec's C and C++ compilers for 680x0 and PowerPC code, and a plug-in version of Apple's MrC compiler.

The SPM is an exemplary integrated environment. It is highly configurable as well as scriptable via AppleScript, providing much of the power that MPW offers developers, but within an IDE. The SPM itself has Macintosh Drag and Drop integrated throughout, allowing, for example, easy addition of files to

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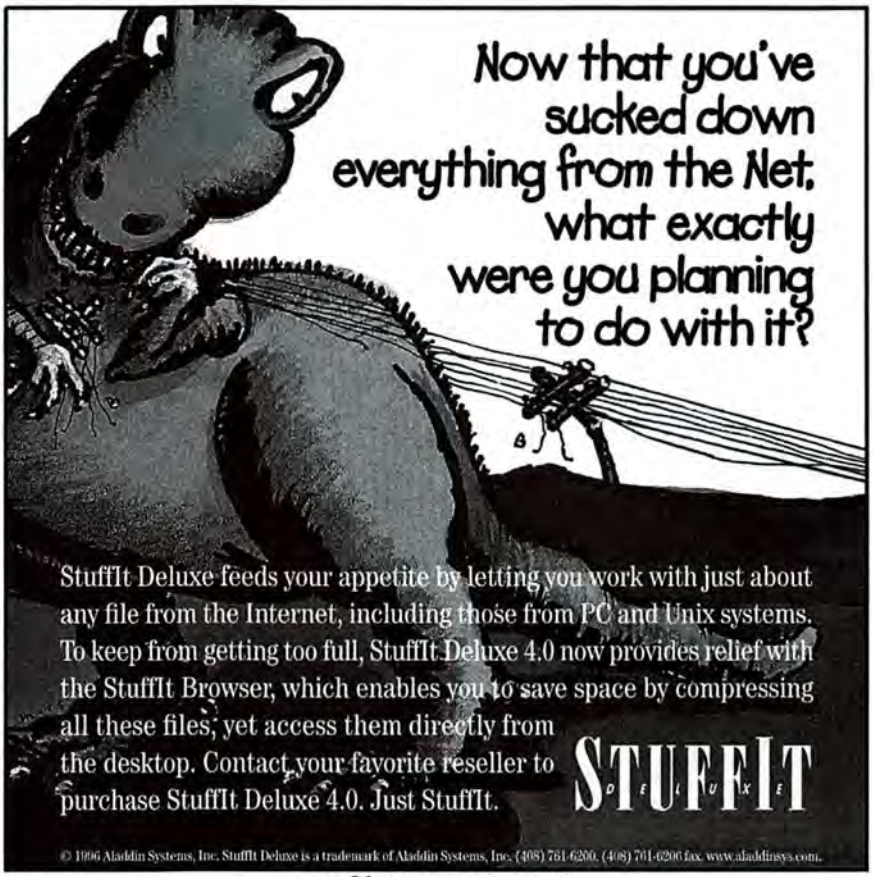

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projects as well as file dragging between projects. The SPM's project model is also more flexible than CodeWarrior's: Not only does SPM allow multiple projects to be open at the same time but a single project can also contain several configurations, making it possible to compile 680x0, PowerPC, or Fat Binary applications from within a single project with a simple pop-up-menu selection. The SPM is smart enough to use only those processor-specific files, such as run-time libraries, that are needed for the current project setting.

As far as 680x0 support is concerned, Symantec C++ 8r5 is somewhat limited and lags behind CodeWarrior. Although the package comes with a compiler for 680x0, it is intended only for applications; code resources and similar pieces of stand-alone code are not supported. In addition, the SPM does not include a linker for 680x0 code, necessitating the use of the (supplied) ToolServer linker, a somewhat cumbersome approach.

SPM supports plug-ins as well, and Motorola's compiler is also available in a version for C++ 8r5, although the integration of this compiler is not as good as it is in the CodeWarrior environment. For those with legacy Pascal code, C++ 8r5 comes with a PowerPC Pascal compiler from Fortner Research, but this compiler is not ready for prime time.

The Bottom Line

Symantec dropped the ball several years ago when it let the THINK languages languish, and the company has been fighting an uphill battle ever since. Following several tries, it arrived at the current version, which offers real competition to CodeWarrior for creating PowerPC applications.

However, although each development environment has its strengths, Metrowerks' CodeWarrior 9 package has the clear edge, due to its comprehensiveness. CW9 meets the vast majority of Mac programming needs today. CodeWarrior 9's IDE is clearly a less refined environment than Symantec's Project Manager, but this shortcoming is more than made up for by the array and quality of the tools in the CW9 package. / Stephan Somogyi

CodeWarrior 9, $399 (list). **Company:** Metrowerks, Austin, TX; 800-377-5416 or 512-873-4700; http://www.metrowerks.com/. **Reader Service:** Circle #406.

Symantec C++ for Power Macintosh Version 8 Release 5, $399 (list). **Company:** Symantec, Cupertino, CA; 800-441-7234 or 408-253-9600; http://www.symantec.com/. **Reader Service:** Circle #407.

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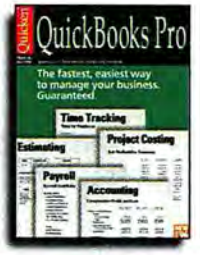

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File Servers

Apple Network Server 500/132

★★★★

Apple Network Server 700/150

★★★★½

Apple serves up versatile PowerPC-based UNIX computers.

PUBLISHING COMPANIES and prepress houses, where the Mac is the platform of choice for creative work, often find themselves in need of something more powerful than an Apple Workgroup Server for storing, moving, and printing huge files. The typical solution is to use a UNIX-based server. Sometimes it's just a very big file and print server; in other cases, publishers add OPI (Open Prepress Interface) software to churn out print jobs containing complex, high-resolution images.

Apple wants a piece of the publishing-server market and may have a chance with the Network Server 500 and Network Server 700. These new machines are the biggest, most expensive Apple computers ever built — but they're definitely not Macs.

Your first clue that these boxes aren't Macs is the fact that they ship without system software installed. The clincher is that the operating system they run isn't the Mac OS — it's AIX 4.1.2, a version of IBM's UNIX operating system. AIX is a necessity for running the Network Servers, so consider its $1,498 price a hidden cost of buying one.

Beefy Boxes

The Network Server 500/132 and Network Server 700/150 are very close siblings: The 500 sports a 132-MHz processor and 512K of Level 2 cache, whereas the 700 has a 150-MHz processor, 1 MB of Level 2 cache, and two hot-swappable power supplies. Each includes six PCI slots and a minimum of 32 MB of RAM (upgradable to 512 MB).

The Network Servers are also built for speed. In addition to having fast processors and PCI expansion options, the Network Servers are the first Apple systems to come with Fast-and-Wide SCSI built in. Each Network Server has two Fast-and-Wide buses (one internal, one external) and an external SCSI-1 bus. Most server configurations ship with a 1-GB SCSI-2 disk drive, and a top-of-the-line Network Server 700 contains a 4-GB Fast-and-Wide drive. Networking support is provided by an AAUI Ethernet adapter. You can also use one or more Network Interface Cards for connectivity to Fast Ethernet or other high-speed networks.

The Network Server cabinet is roughly cube-shaped and measures about two feet on each side. Although it can hardly be called sleek, it offers a new and genuine manifestation of Apple's flair for industrial design. It's easier to upgrade and maintain a Network Server than it is to poke around in many Macs, and all the components, from fans to drives to power supplies — are designed to be hot-swappable. That is, they can be removed and replaced quickly, even while the computer is running.

Apple's Network Server cabinet design is completely modular, with fully hot-swappable components.

Four of the servers' seven half-height SCSI-drive bays ship filled — by a floppy drive, CD-ROM drive, DDS-2 DAT drive, and hard drive. You can get at these easily by sliding each bay's drawer out of the server. You can also slide the logic board out easily when it's time for a memory or processor upgrade. Key locks are provided to prevent unauthorized removal of components.

Don't plan on running a Network Server in "headless" mode, without a monitor: Server management from a Mac client isn't sufficient for all tasks (we'll tell you why a bit later). The Servers include a built-in video subsystem that lets you run a Mac or VGA monitor up to 20 inches in size in 256 colors.

Foreign Correspondent

For the Network Servers, Apple has scrapped its homegrown UNIX variant (the ill-fated A/UX). The Network Servers instead employ AIX, a mature operating system that is used by IBM in its own PowerPC- and RS/6000-based PCs and workstations. Since Network Servers are intended to serve Macintosh clients, Apple has added an AppleTalk stack to the basic operating system and includes some rudimentary utilities for use by Macintosh-based system administrators. Unfortunately, you can't do much more than create logical volumes — disk partitions — or log onto the server via a command-line interface from the Macintosh software. However, AIX does include a system-management application called SMIT, which looks a lot like a menu-driven DOS application. With it, you can perform most system-administration tasks, including doing disk and volume management, creating users' accounts, and scheduling and initiating system backup. Nonetheless, a more full-fledged Macintosh tool would be welcome.

Although you're not required to have file-server software to share data among UNIX systems, Macintosh users can't get access to data stored on a Network Server unless you've added AFP-compatible server software. Apple includes trial versions of two packages: IPT's uShare and Helios' EtherShare. Each package includes AFP file-server software as well as print- and OPI-server software. uShare's trial version is limited to one user and 30 days of

PHOTOGRAPHY / TOM UPTON

access. The EtherShare demo limits client connect time to three hours per session. These trial versions are just that, and the included printed information fits into a CD-sized booklet. There are online documents, and the complete versions of each package provide full documentation.

The documentation for both supplied programs is rather limited. The two packages offer the same basic functionality: file, print, and OPI services. Because Apple's remote-management utilities are so limited, we looked to uShare and EtherShare for a way to manage the Network Server from a Macintosh. IPT's uShare tools are superior, providing a Mac-like interface for system-management tasks such as assigning user accounts, creating and managing file systems, and maintaining the print queue. If you opt to use Helios' EtherShare to manage a Network Server, you'll need to take a seat at the Network Server or use Apple's rudimentary disk-management and terminal software.

The Bottom Line

Apple's Network Server is a solidly designed hardware platform with a road-tested operating system behind it. It's the first Apple computer built *as* a server, and it competes well in terms of price and features with UNIX-based systems from Sun and Silicon Graphics. We would like to see more thought put into remote system management: Counting on third parties to provide even the basics is shortsighted. Although Apple correctly warns that administering a Network Server requires being comfortable and experienced with UNIX, it seems probable that administrators will use a Macintosh to work with the server, so a robust Mac OS-based management tool with a friendly face would go a long way toward easing administrative tasks. UNIX experts will find just about everything in the Network Server to be familiar. One oddity we noticed: Apple includes a standard ADB II mouse with the Network Servers — the same one-button cursor controller it ships with its Mac OS systems — rather than the three-button mouse usually found on UNIX systems. To simulate the other buttons, you have to hold down the left and right arrow keys, respectively, while you click the mouse. / Shelly Brisbin

Apple Network Server 500/132 (32MB/2GB/CD/DAT), $10,969; **Apple Network Server 700/150** (32MB/1GB/CD), $11,829; (list). **Company:** Apple Computer, Cupertino, CA; 800-776-2333 or 408-996-1010; http://www.apple.com/. **Reader Service:** Circle #408.

BBEdit 4.0

★★★★½

Powerful text editor evolves into rich Web authoring environment.

PEOPLE WHO MANIPULATE text as data — programmers and Web authors — can benefit greatly from a well-designed text editor. And for all who get beyond its everything-but-the-kitchen-sink interface, BBEdit, from Bare Bones Software, is *the* text editor. It has capabilities that any word worker might find useful, such as the ability to do complex, pattern-based searches across multiple files at once. But it has traditionally seen the most use among programmers as a source-code editor. Recently BBEdit was extended to support Web authoring, and version 4.0 follows through with a bevy of versatile tools for Web-sters.

A floating palette for HTML tools and awareness of Java-language syntax are among the Web authoring advances in BBEdit 4.0.

It's a Program Editor . . .

BBEdit recognizes the syntax of most popular Mac languages and scripting systems, and now in this version, Java. Version 4.0 uses this savvy to let you assign different colors to language keywords, comments, and string constants (or, in HTML, tags, image references, and anchors). This "syntax coloring" makes your source code easier to read and debug.

One strength of BBEdit has always been its extensibility. The new glossary system makes extending BBEdit easier, allowing you to create simple macros that can be invoked by name or with a keystroke. At the opposite extreme of complexity, you can use the Extensions Developer Kit that ships with BBEdit to create extensions to augment BBEdit.

AppleScript, which you can also employ to extend BBEdit's usefulness, is far easier to use in version 4.0, thanks to new support for Apple events' object model, which gives scripts direct access to individual words, lines, and characters in BBEdit documents.

. . . and a Web-Site Editor

With version 3.5, Bare Bones Software moved BBEdit into the Web authoring realm by adding some rudimentary HTML tagging features. The current version goes well beyond the basics: It puts the tags into a floating palette; adds support for forms, tables, and the HTML 3.0 standard; improves HTML syntax-checking and -previewing features; and adds several new Web-page-authoring features.

BBEdit is not a WYSIWYG editor, although it can preview files in your preferred Web browser. Placing links and images is a simple matter of dragging and dropping file icons. Not only can BBEdit check your HTML syntax and the integrity of your links but it can also spell-check your documents with an HTML-savvy spelling checker.

The Web-site authoring features go well beyond editing HTML files. Bare Bones has included the full Userland Frontier scripting system and a set of Frontier Web scripts for automating Web-site development processes. Also, among the dozens of included goodies are a freeware extension that executes MacPerl scripts from within BBEdit, several extensions for writing version 1.0 VRML, and basic FTP client software. Particularly important for Web-site authors is BBEdit's ability to perform richly defined search-and-replace operations on user-defined groups of files.

The Bottom Line

Macintosh programmers and word workers who are willing to deal with BBEdit's complexity should be pleased with the enhancements in this version of BBEdit. But the big winners are Web-site developers. Version 4.0's support for Java, Perl, and HTML editing, along with the program's site-management and scripted-text-processing features, make it a powerful Web authoring tool. / Michael Swaine

BBEdit 4.0, $119 (list). **Company:** Bare Bones Software, Bedford, MA; 617-676-0650; http://www.barebones.com/. **Reader Service:** Circle #409.

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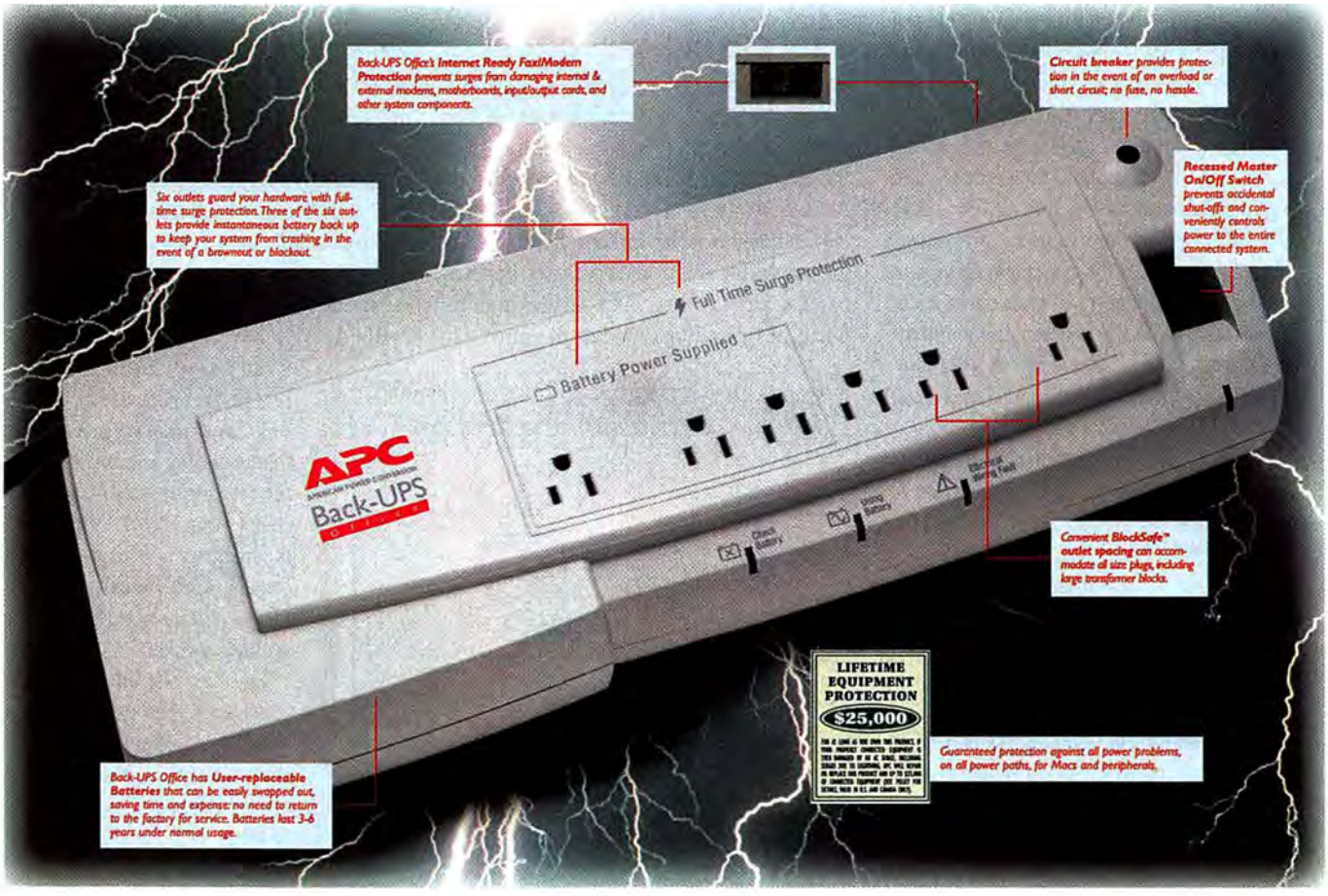

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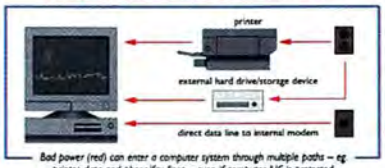

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Back-UPS Office's compact design installs easily on desktop, floor or mounts to wall.

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CIRCLE **83** ON READER SERVICE CARD

Java Programming

Roaster DR2 ★★★

Discover Programming with Java ★★★★

Symantec Café for Macintosh DR1 ★★★½

The first batch of Java tools isn't fully brewed.

UNLESS YOU'VE SPENT the last year in cyberoblivion, you know Java is hot: Sun Microsystems' new cross-platform programming language for the World Wide Web lets any Web surfer with properly equipped browser software run Java applets embedded in Web pages. Java applets work on many platforms — including Windows, UNIX, and OS/2 machines as well as Macs — but the tools for building them differ significantly in each operating system: Each OS, for example, has its own specific shared-code libraries (Sun calls these advanced windowing toolkits, or AWTs) that you use to generate the user interface for your Java program.

If you want to get started in Java programming, you can do so for practically nothing — but you get what you pay for: Sun Microsystems' Java Development Kit (JDK) is available as a free download at http://www.javasoft.com/JDK-1.0/index.html. The kit, which runs on 680x0 as well as PowerPC Macs, includes everything you need in order to develop Java applets on your Mac, including a Java compiler, the standard Java classes that permit Java's portability across platforms, and an applet viewer.

The JDK is fine for hobbyists or the Java-curious, but pros who want to convert code to cash as quickly as possible need tools that organize programming resources and projects efficiently, for speedy completion. All three of the products in this review include the JDK and supplement it with a variety of organizational tools.

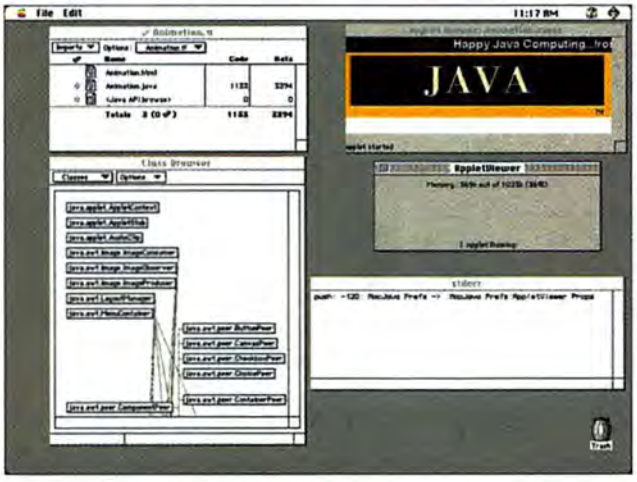
Roaster DR2

Natural Intelligence's Roaster was the first Java programming tool to ship for the Mac, although it's still technically not a commercial product: The version we tested was branded Developer's Release 2. The original version was notoriously unstable, but for months it was the only tool for the job and many developers have adopted it. Regular free updates have brought greater reliability, and Apple has licensed Natural Intelligence's virtual machine as its "official" Java engine. Roaster provides a well-integrated programming environment for writing, editing, compiling, debugging, and running Java applets. So far, so good.

Roaster still lacks some important tools, however: There's no graphical source debugger, for instance. (Roaster does include a Java byte-code debugger, but it's nearly worthless unless you want to learn the Java virtual-machine language.) More significant, some stability problems persist, although Natural Intelligence promises continual bug fixes.

Discover Programming with Java

Like other Metrowerks products, Discover Programming with Java integrates seamlessly into the CodeWarrior system of programming tools — all of which share a common, Mac-centric interface. (The Java tools included in



Symantec Café for Macintosh DR1 provides a viewer that lets you watch your Java applets as they run and also gives you multiple views of your program and the classes it contains.

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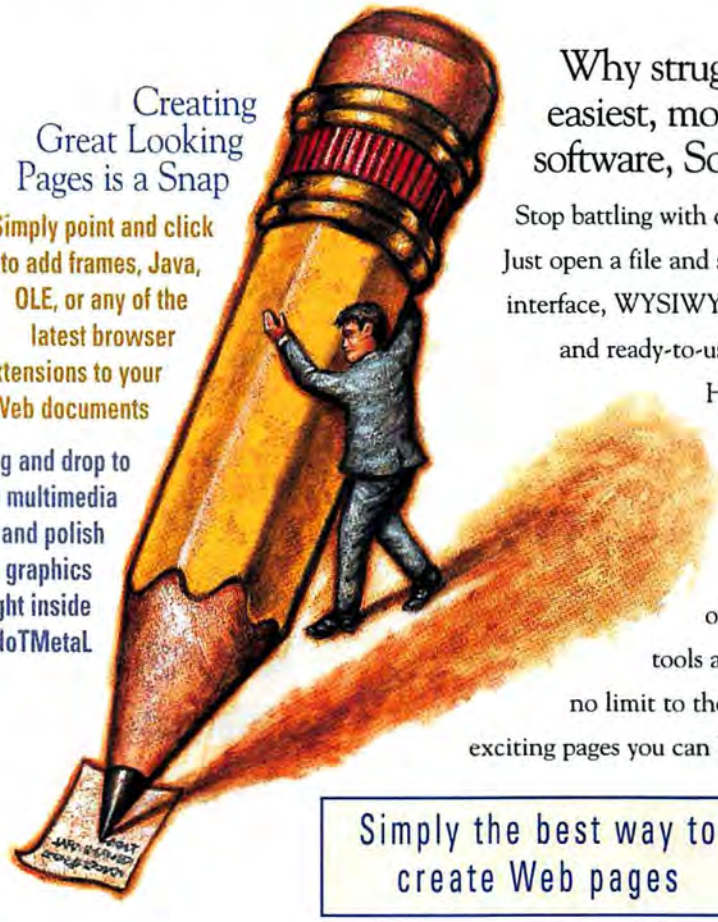

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CIRCLE **12** ON READER SERVICE CARD

Discover Programming with Java are embedded in CodeWarrior 9 [$399 list], Metrowerks' latest C/C++ programming environment.)

Discover Programming with Java includes Metrowerks' powerful CodeWarrior Integrated Development Environment (IDE), an electronic version of Barry Boone's *Learn Java on the Macintosh*, and six Apple Guide files. It runs on 680x0 Macs as well as PowerPC-based systems.

Discover Programming with Java also includes a Sun-validated Java plug-in compiler (integrated into the CodeWarrior IDE), the Sun Java compiler, an integrated linker, a preferences plug-in, a Java class browser, a source-level Java debugger for 680x0 Macs and PowerPC systems, a Java byte-code interpreter, a Java byte-code disassembler, and an applet viewer.

In addition, the Discover Programming with Java virtual machine does exactly what a Java VM is supposed to do — provide perfect compatibility with the Sun Java specifications. But it also does something the Sun compiler doesn't do: compile and run fast!

Symantec Café for Macintosh DR1

Unlike Roaster and Discover Programming with Java, Symantec Café debuted on Windows 95 and NT before it came to the Mac. Symantec touts it as a natural extension of its C/C++ development environment for Macs and Windows machines, and for the most part, it is.

Symantec Café for Macintosh is a solid, professional-caliber Java environment for the Mac, although this version is, in many ways, still a prerelease version (it doesn't run on 680x0 Macs, and the CD-ROM is labeled DR1, for *Developer Release 1*).

Despite its roughness around the edges and incompleteness, Café offers a powerful source-code editor; the well-known SPM (Symantec Project Manager), for manipulating Java projects; an integrated graphical class browser; and a fast PowerPC-native Java compiler. You also get 90 sample applets and an integrated applet viewer for evaluating results. Café offers full AppleScript support and is Apple-events-scriptable and -recordable.

More intriguing are the still-unfinished pieces of Café, one of which comes in the box: The Studio Visual programming environment lets you create Java-applet layouts with minimal coding by placing buttons and menus on a template. The accompanying Read Me file tells it like it is: Studio Visual is still prerelease, and its functions don't all work yet.

Still awaiting inclusion in the product are a graphical source debugger and a JIT (just-in-time) compiler. Mac users' productivity with Café will lag until those tools are ready, but once they arrive, they should be top-notch: The Windows 95 versions of these tools are quite good. If you buy Café today, you'll get the debugger, JIT compiler, and completed Studio Visual tools free when they ship.

Café derives from Caffeine, a clunky set of Java tools Symantec released earlier this year, but it works much more like the company's other language systems, especially C++ for Power Macintosh Version 8 Release 5.

As with Symantec C++, you drive Café from within the SPM, where you check .html and .java files in and out before and after you work with them, which is useful for helping track team programming efforts. Still, we'd like to see it support multiple versions of the same piece of code for a single project as well as file tracking by author or modification date.

The Bottom Line

Both Symantec Café for Macintosh DR1 and Roaster DR2 are, as their names imply, unfinished products that lack important features — most notably graphical debuggers. Roaster remains unsettlingly unstable as well. And although Café is well integrated into Symantec's C/C++ programming environment, its rough edges and lack of 680x0-Mac support are significant drawbacks. Discover Programming with Java, by contrast, offers a good debugger, tight integration into the CodeWarrior programming environment, and the fastest compiler among those we tested. For PowerPC-system users already comfortable with Symantec's coding environment and prepared to wait for free updates, Café isn't a bad choice. But if you're looking for raw speed — or you're programming on a 680x0 Mac — Discover Programming with Java (or CodeWarrior 9) is for you. / Don Crabb

Discover Programming with Java 1.0, $99; no extra charge as part of $399 CodeWarrior 9 (list). **Company:** Metrowerks, Austin, TX; 800-377-5416 or 512-873-4700; http://www.metrowerks.com/. **Reader Service:** Circle #410.

Roaster DR2, $299 (direct) — includes upgrades to commercial versions 1 and 2. **Company:** Natural Intelligence, Cambridge, MA; 800-999-4649 or 617-876-4876; http://www.natural.com/. **Reader Service:** Circle #411.

Symantec Café for Macintosh DR1, $99.95 through July 30, 1996; $299.95 thereafter (list). **Company:** Symantec, Cupertino, CA; 800-441-7234 or 408-253-9600; http://www.symantec.com/. **Reader Service:** Circle #412.

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IF YOU'VE EVER STRUGGLED to find the perfect soundtrack for a multimedia presentation, you'll love SmartSound for Multimedia. SmartSound is billed as "the absolute easiest way to create customized, professional quality soundtracks." Believe it.

To create a soundtrack, you start in the Maestro module, which poses a series of questions about the type of soundtrack you wish to create. Choose a length and a style — peaceful/easy, jazzy, and the like — and, after a bit of cogitation, SmartSound presents you with a handful of potential soundtracks.

You could stop right here and import your favorite one into whatever multimedia-development tool you prefer — but you probably won't. As good as the soundtracks Maestro creates are, you're almost certain to want to refine them in the SmartSound Editor.

The SmartSound Editor is a drag-and-drop music-editing environment that requires no musical knowledge. Each soundtrack is made up of a series of short musical phrases called Smart Blocks. After Maestro strings together the blocks it thinks will work best for you, you can use the editor to add, delete, or rearrange blocks; add special effects; and smooth endings and transitions.

An automatic hinting system alerts you if the Smart Block you're about to add is not stylistically compatible with the rest of the soundtrack. There's also a "Smart Ending Maker" that extends or shortens your soundtrack without wrecking its musicality.

A useful bonus is a set of household, telephone, and environmental sounds and noises you can add to your soundtracks or use by themselves.

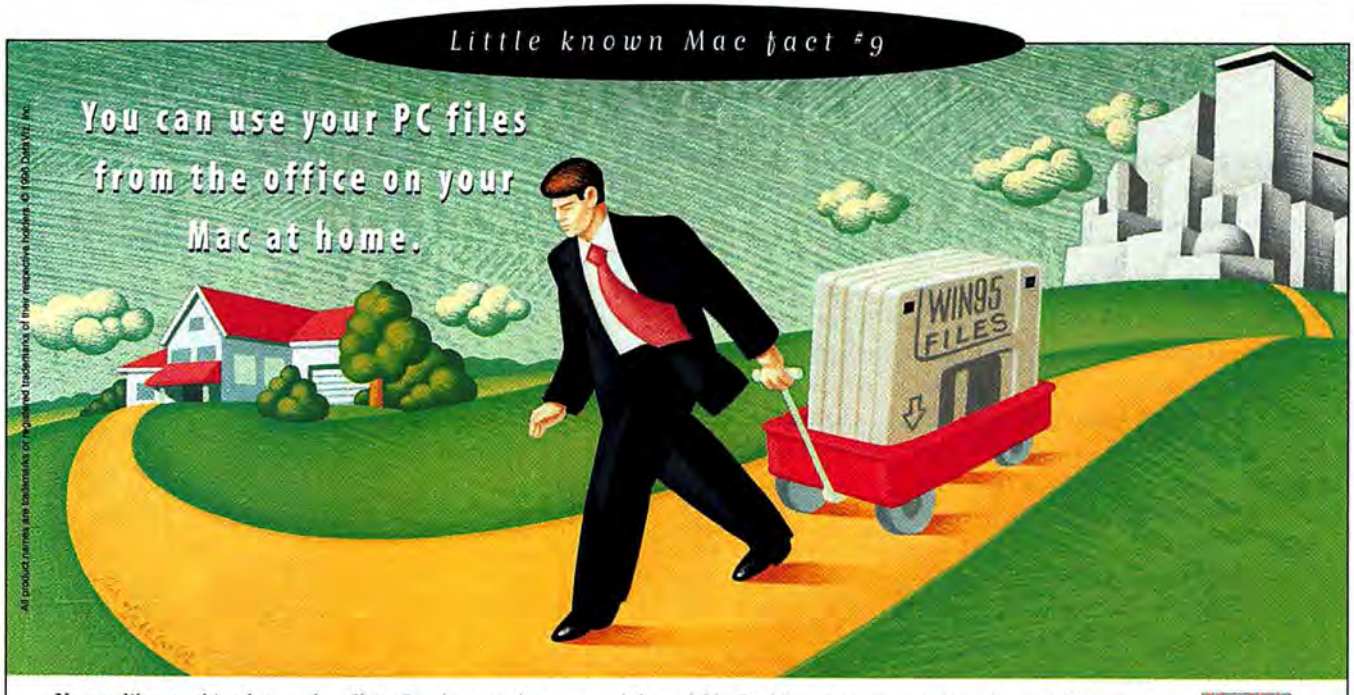
About the only criticism we have is that the documentation is sketchy and available only as an Adobe Acrobat file. On the other hand, SmartSound's informative Apple Guide answered most of our questions — we rarely had to refer to the manual.

The Bottom Line

SmartSound for Multimedia is an indispensable tool for multimedia producers who don't have the musical skills to use traditional wave-editing software or don't have the time to sift through hundreds of clip-media sound samples looking for that perfect 12-second clip. You and SmartSound for Multimedia can make beautiful music together. / Bob LeVitus

SmartSound for Multimedia, $179 (list). **Company:** Sonic Desktop Software, Chatsworth, CA; 818-718-9999. **Reader Service:** Circle #413.

SmartSound for Multimedia's Editor lets you add, delete, and modify musical-phrase "Smart Blocks."



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Astarte Toast CD-ROM Pro 3.0

★★★★

Upgrade reduces the odds that your write session will fail.

DESPITE IMPROVEMENTS in CD-Recordable (CD-R) hardware over the past year, the chances that a blank CD-ROM will become a giant tiddledywink during a recording session are still alarmingly high. Toast CD-ROM Pro 3.0, a recent upgrade to Astarte's popular CD-ROM-mastering software, addresses this problem effectively with new features that protect the safety of your data.

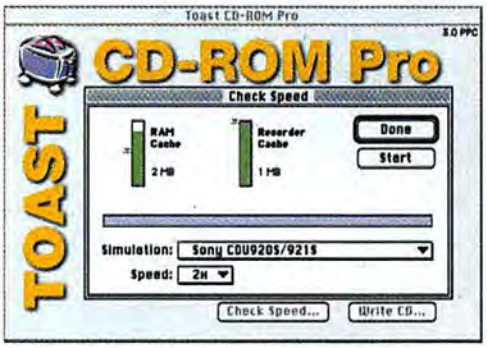
The main reason for ruined CD-ROMs is a problem called *cache underwriting*, which occurs when the CD-ROM recorder is ready to write data to the disc but the source disk drive is unable to supply data fast enough — typically because instead of reading data and feeding it to the recorder, it's searching for a file. Toast 3.0's new optimizing strategy smoothes the way to error-free writes. The program sets up a temporary cache on the internal hard disk and copies all the 1K-or-smaller files you plan to write to the CD-ROM (the ones that take longest to find on a hard disk) to the cache, where they can be read quickly, in a single stream. Toast then organizes the larger files so they can be read as quickly as possible.

Once the data you need to read is optimized, Toast offers you two options that affect the way the data will be written onto the CD-ROM: You can organize the CD-ROM for maximum playback speed or for maximum data capacity.

In either case, Toast burns all directory and icon information onto the outside tracks, which makes mounting the CD-ROM quicker.

Toast's interface is still sparse, which is generally a blessing: To record files onto your CD-ROM, you simply drag them into Toast's data window, where they appear in a Finder-like list. Click on the Check Speed button, and Toast simulates a recording session to make sure everything works. Toast supports the vast majority of Mac CD-ROM burners.

The new package is available for $359, which is in line with similar packages' prices. Upgrades to earlier versions of Toast are $99.



The Check Speed command in Toast CD-ROM Pro 3.0 lets you ensure before your recording session that your system will successfully write to the CD-ROM.

Astarte is also providing a competitive upgrade (to those who use mastering software other than Toast), for $149.

The Bottom Line

This upgrade adds a few nice enhancements to a straightforward app. But it's not a major upgrade, and those with Toast 2.5 probably don't need to upgrade unless they often have problems with underwrites. / Kristina De Nike

Astarte Toast CD-ROM Pro 3.0, $359 (list). **Company:** Astarte USA, San Francisco, CA; 415-285-0316; http://www.astarte.de/. **Reader Service:** Circle #414.

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CIRCLE **82** ON READER SERVICE CARD

Eudora Pro 3.0

★★★★

Outstanding e-mail reader gets even better.

THE STANDARD FOR INTERNET e-mail since its release as freeware years ago, Qualcomm's Eudora got its first real competition last year, with the release of Claris Emailer. Qualcomm's response, Eudora Pro 3.0, adds an improved user interface as well as powerful message-management features to already excellent POP/SMTP mail-client software.

The most noticeable addition to version 3.0 is a user-configurable tool bar that lets you assign commonly used menu commands to buttons. Although initially skeptical, we found using the tool bar to be a great shortcut. The most valuable addition to Eudora 3.0 is complete integration of Macintosh Drag and Drop. It speeds up moving messages among mailbox windows, moving text blocks among messages, attaching files to messages, and addressing messages from your address book.

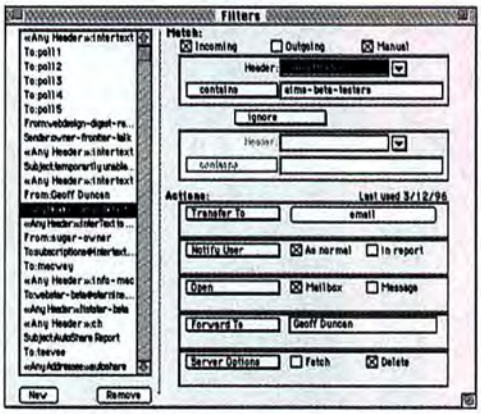
Eudora Pro 3.0 automatically colors and underlines URLs (Uniform Resource Locators) in every message. Command-clicking on a URL launches any Internet application you specify. Eudora also no longer chops messages longer than 32K into several smaller messages. And Eudora now supports styled text in messages.

Although Emailer initially outshone Eudora at message filtering, Eudora 3.0 takes the lead again. The new Filters window lets you assign up to five different actions to a single message: forward, auto-reply, file in a mailbox, print, or color-code.

Eudora's weak Find command has been radically changed in version 3.0. Its VCR-style window lets you shuttle among messages and mailboxes, choosing exactly what files you want to search through. At times we found ourselves unsure of exactly what mailboxes we were searching through, but the search engine is so quick that even searching through all your mailboxes is pretty painless.

Eudora 3.0 introduces a plug-in architecture for reading and altering messages. No plug-ins ship with Eudora 3.0, so for now, the architecture remains mere exciting potential.

Unfortunately, one of Eudora Pro's weaknesses hasn't been fixed: the way you address messages. If you drag and drop an addressee onto the wrong place or forget to insert a comma between addressees' names, your message won't be sent.



Powerful filters in Eudora Pro 3.0 can identify messages by a broad range of criteria.

The Bottom Line

Eudora Pro 3.0 is a powerful, flexible e-mail tool that we recommend without hesitation for people who use the Internet for the bulk of their e-mail. / Jason Snell

Eudora Pro 3.0, $89 (list). **Company:** Qualcomm, San Diego, CA; 800-238-3672 or 619-658-1291; http://www.eudora.com/. **Reader Service:** Circle #415.

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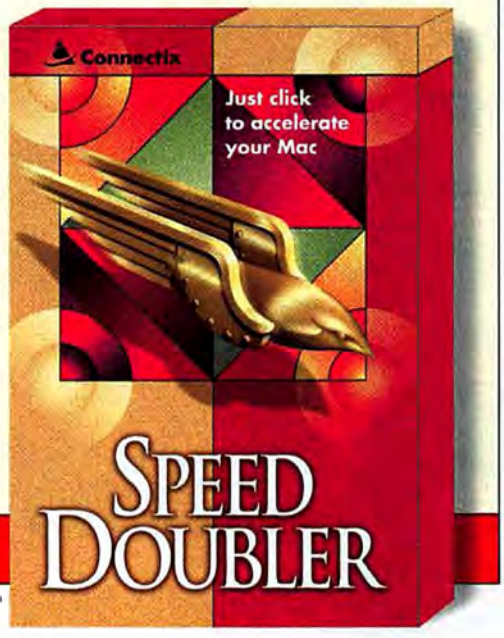

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CIRCLE 67 ON READER SERVICE CARD

Gryphon Bricks

★★★★

Lego-like building toy offers addictive amusement.

GRYPHON BRICKS, a virtual construction set that brings Lego-style blocks to the Mac, offers an appealing introduction to the promise (and challenges) of 3-D-design software. It doesn't provide a tangible model to bring to show-and-tell, but it does prevent that greatest of Lego frustrations: running out of bricks.

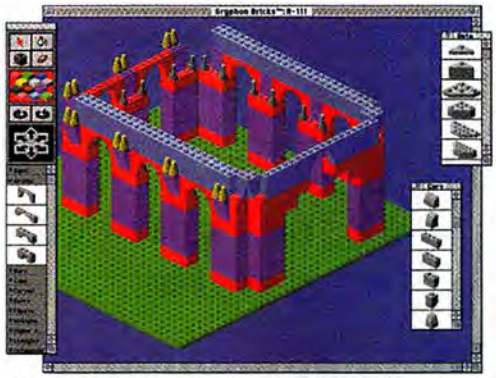
Anyone who's ever played with Lego blocks will immediately understand Bricks: The main work window contains a base plate, viewed in an orthogonal 3-D projection. To build your creations, you grab bricks from on-screen palettes and place them on the base plate (or on other bricks). Bricks can be grouped and assigned any of 12 colors, and there are more than 200 styles of bricks to choose from.

The Bricks package actually contains two separate applications, KidBricks (recommended for kids ages 5 to 10) and Gryphon Bricks. Each program uses the same design engine and file format. KidBricks presents its tools in a single modular window with oversized buttons and no menu bar. Gryphon Bricks offers a more traditional Mac interface, with pull-down menus and floating, tear-off brick palettes. You also get a Multiview option, which shows miniature top, front, and side views of projects alongside the main window.

Multiview quickly becomes necessary once your project gets a few tiers high, because of the inherent difficulties in simulating a 3-D object on your 2-D monitor: Without the multiple views, it can be difficult, for example, to tell if a partially obscured brick is behind or beneath the one that's blocking it — or both.

The adult version of the program provides access to the customizable Scripts menu, containing a handful of useful AppleScript scripts that let you do things such as hide bricks, make a QuickTime animation of your project's construction, or select all bricks of a certain type or color.

Bricks is fun and impressively stable for a version 1.0 product, but it lacks a few features we'd like to see. Tops on the wish list is a zoomable work window. If your project is larger than the viewing window, there's no way to see it all without scrolling. We'd also like to be able to rotate the base plate and to color an entire selected group of bricks at once.



Tear-off brick palettes are available in the "grownup" version of Gryphon Bricks 1.0 (shown here), but they are hidden in the KidBricks version of the program.

The Bottom Line

Gryphon Bricks is unique — a new type of diversion software. It's entertaining, addictive, and capable of great sophistication. It will please kids and grownups alike. / Jim Shatz-Akin

Gryphon Bricks 1.0, $39.95 (list). **Company:** Gryphon Software, San Diego, CA; 800-795-0981 or 619-536-8815; http://www.gryphonsw.com/. **Reader Service:** Circle #416.

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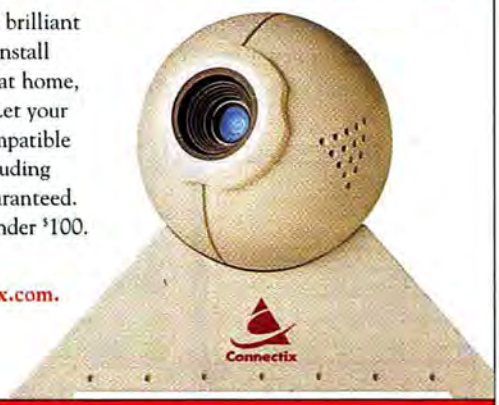

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CIRCLE **64** ON READER SERVICE CARD

Minitab Release 10 Xtra

★★★½

Minitab moves squarely into the Macintosh mainstream.

IN THE COURSE OF our daily record keeping, nearly all of us — whether we're Amway distributors with our receipts in a shoe box or industrial chemists with huge mainframe databases — generate loads of potentially useful statistical data. The key word, however, is *potentially.* That is, unless you have a tool such as Minitab Release 10 Xtra, which helps you analyze your data to uncover information about your customers and their habits and buying patterns — or about the safety or efficiency of manufacturing processes.

Minitab has been available on the Mac for years, but even the most recent version, Release 8, which appeared in 1991, was a half-hearted UNIX port, window-dressed with pull-down menus and dialog boxes but still largely dependent on a command-line interface. Earlier versions of Minitab were not very compelling and were downright hard to use — although their underlying statistical engines were solid.

Release 10 augments Minitab's already robust stats engine with a variety of new features, including analytical tools designed for industrial quality control. The latest version is also considerably more Mac-like than its predecessors: It even ships in a fully PowerPC-native version (a non-PowerPC version also comes in the box), for zippy speed even when crunching huge data sets.

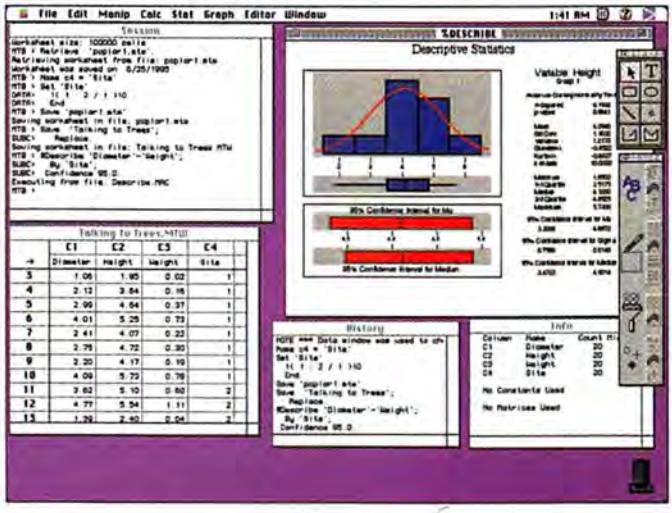
Some decidedly non-Macintosh remnants remain, however: That pesky command-line window is still there and is still the only means for performing some Minitab tasks. Furthermore, variable names cannot exceed eight characters and the program appends *.mtw* to all filenames. Dialog boxes are sometimes cluttered and lacking in cues that help you keep track of your data. In just one of numerous examples, a dialog box you access via the Fractional Factorial tool menu asks you to enter a series of variable names such as *height, length, weight,* and so on in one text window, separated only by spaces. In a second window within the dialog box, you're given the option of specifying maximum and minimum values for each variable, but to do so, you must take care to type the numbers in the same order you typed the variable names. We'd much prefer a more tabular data-entry system that makes it easy to see which numbers correspond to which variable names.

Addressing one of Minitab's greatest shortcomings, version 10 adds graphics tools that let you tweak any of Minitab's chart types — bar, line, pie, scatterplot, 3-D wire frame, and surface plot. Graphics-manipulation tools, including type-adjustment and basic drawing and painting tools, are furnished on floating palettes. Although the tools are not Mac-standard, you'll quickly learn how to use them if you've ever used any Macintosh drawing or painting program.

Interface 101

The addition of extensive online help and clear, comprehensive manuals makes it easy to get up and running with Minitab. Note, however, that even though the program is widely used in university-level statistics classes, it isn't in itself an instructional tool. The program can perform more than 200 types of analyses, from descriptive statistics through regression analysis, analysis of variance, and multivariate analysis. The program also includes tools that generate random data for use in simulating real-world events and tools for tracking trends over time. If you want to predict the value of your investment portfolios, given various market factors, you'll have the tools to do it.

New quality-control functions include Shewhart control charts, Weibull and normal probability plots, and cause-and-effect (fish bone) diagrams and Pareto charts.



Advanced graphics tools arranged on floating palettes and a generally more Mac-like interface mark Minitab Release 10 Xtra.

Playing 'What If'

To make the most of these powerful capabilities, you'll need a working knowledge of statistical methods, but that doesn't mean that you have to know *exactly* what you're looking for when you start crunching your data.

Minitab is designed to be interactive and includes numerous tools for exploratory data analysis (EDA); the tools let you take an "I wonder" approach to uncovering relationships in your data. As you run a Minitab session, it's straightforward to go back to the session window and retry an analysis with different options, much as you might in the session window in Wolfram Research's Mathematica. Despite this flexibility, Minitab is far less free-form in its EDA capabilities than Data Description's Data Desk 5.0, a rival program that costs three times as much as Minitab.

You also get a useful macro-programming language to help automate your analyses and create analysis "mini-applications." The macro language includes real programming structures (such as IF, ELSEIF, ELSE, and WHILE) and verbs (such as GOTO, DO, PAUSE, and RESUME), so you can create very handy customized tools you can use over and over.

The Bottom Line

Thanks to an improved Mac interface, more than 200 statistical tools and tests, and the ability to produce eye-popping charts and graphs, chances are good that Minitab can slice, dice, and serve up your data the way you want it. Minitab 10 Xtra may have been long in coming for the Mac, but now that it's here, it shouldn't be ignored. / Don Crabb

Minitab Release 10 Xtra, $208 (direct). **Company:** Minitab, State College, PA; 814-238-3280; http://www.minitab.com/. **Reader Service:** Circle #417.

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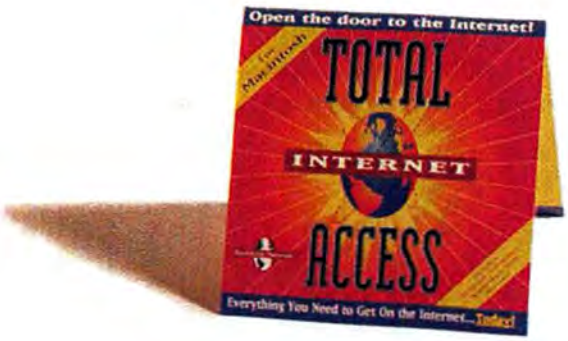

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CIRCLE 90 ON READER SERVICE CARD

A MACUSER EXCLUSIVE REPORT ON THE PRODUCTS AND TECHNOLOGIES BEHIND APPLE'S DOORS

LOOKING INTO APPLE'S FUTURE

IT'S BEEN A TOUGH YEAR FOR APPLE. Flaming PowerBooks. A three-quarters-of-a-billion-dollar loss. The company's stock price on the skids. We've watched sadly as Apple has become a favorite whipping boy of both press and pundits. We've listened as these experts predicted Apple's demise: at best, doomed to become a purveyor of niche products; at worst, destined for the dustbin of computer history.

So why is it that Apple's Mac continues to be the computer of choice among publishing and media-authoring professionals, one of the most vibrant sectors of the personal-computing market? Why is it that Apple maintains its strong showing in the education market? Why is it that, despite Apple's woes, millions of Mac customers remain the most loyal of any in the personal-computer industry?

The answer: superior technology. The Mac is just plain better. You'd be hard-pressed to find anyone who disputes this point. The Mac is easier to install. Easier to use. Easier to maintain. Easier to upgrade. Easier to network. And now, with the fastest PowerPC 604e processor outpacing the top-of-the-line Pentium Pro, the Mac is faster as well.

The problem is, in the fast-paced world of computer technology, being better is no guarantee of success, short- or long-term. What you've already accomplished is interesting. But your survival depends on what you're going to do *next*.

That's why *MacUser* spent the last few months on a hunting expedition throughout Apple, trying to discover what the company has in store for you. Although we found Apple in the throes of yet another corporate reorganization, and therefore in a bit of disarray, we nevertheless uncovered incontrovertible evidence that the rumors of Apple's death have been greatly exaggerated. Apple remains one of the leading centers in the computer industry for the development of innovative technology. And we have the proof.

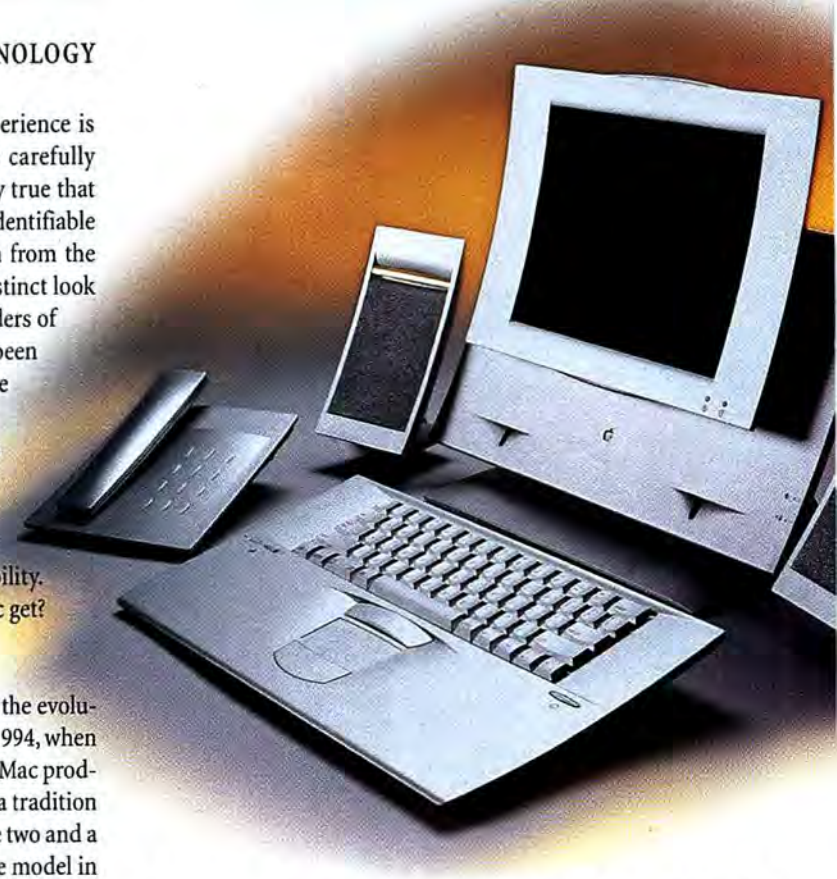
Here's the report on what we found, the most comprehensive look ever at Apple's technological future. We take you behind the scenes and show you what tomorrow's Macs have in store for you — and how they'll be different from what's available today. We give you the inside scoop on Apple's system-software plans. We take the wraps off Apple's plans for the Internet. And we give you a glimpse into what Apple's new Information Appliances Division — the folks who make Newtons and Pippins — are up to.

In each area we examine, we provide a reality check, so you know what's real and what's just a pipe dream. And just because we can't resist it, we give Apple a piece of our mind as well.

So join us as we present our insiders' guide to Apple's future.

BY HENRY BORTMAN AND THE MACUSER STAFF

PHOTO ILLUSTRATION / GIAMPIERO BENVENUTI



MACINTOSH

ALTHOUGH IT'S TRUE that the Mac experience is largely the result of the machine's carefully crafted operating system, it's equally true that hardware is often the most easily identifiable factor differentiating the Macintosh from the vast unwashed masses of Intel-based clones. From the distinct look of products such as the PowerBook 500 series to the wonders of plug-and-play — well, everything — Mac hardware has been an equal partner in the equation that's made the Mac the easiest-to-use personal computer in the world.

It's also true that Mac hardware has recently made strides that many thought impossible just a few months ago. Now arguably the fastest personal computer on Earth, the Mac stands on the threshold of expanded functionality, greater flexibility, and vastly better industrial design and reliability. Only one question remains: How much better can the Mac get?

Surpassing the Pentium

The most exciting news on Apple's Mac-hardware front is the evolution of the PowerPC. Apple took a gamble back in March 1994, when it began a transition that would eventually move its entire Mac product line to RISC microprocessors. This change broke with a tradition that began with the original 68000-based 128K Mac. Some two and a half years later, the transition is nearly complete. Only one model in Apple's currently shipping lineup, the PowerBook 190, still uses a 680x0 chip.

Apple's gamble is starting to pay off. Macs have all but outgrown the PowerPC 601, used in the original Power Macintosh 6100, 7100, and 8100. The 601 has been replaced by the second generation of PowerPC chips: the less expensive and lower-power 603, used primarily in Performas and PowerBooks, and the high-speed 604, used in most of Apple's current desktop Power Mac models.

Today's hot chips are the 603e and 604e, which offer a significant performance boost over their predecessors. Although the original 603 and 604 were limited to top clock speeds of 150 to 180 MHz, even the slowest 603e and 604e chips run at these speeds. Apple and UMAX Computer are now shipping systems containing 200-MHz 604e chips; Power Computing is offering even faster — up to 225-MHz — 604e-based systems. MacUser Labs has already tested Power Computing clone prototypes containing 240-MHz versions of both chips.

The PowerPC has clearly taken the lead in the race against the Pentium. According to *The Microprocessor Report,* the Pentium is roughly equivalent to the PowerPC 603e — that is, a Pentium and a 603e with the same clock rate should deliver close to the same speed. The faster PowerPC 604e performs on a par with the Pentium Pro. Intel only recently shipped a 200-MHz Pentium.

This puts the PowerPC ahead on two counts. First, the high-speed PowerPC 604e is now widely available in desktop Macs and clones; on the Windows side, many high-end desktop systems still use the slower Pentium chip, not the faster Pentium Pro. Second, the PowerPC is ahead of the Pentium and the Pentium Pro when it comes to clock speed.

The More the Merrier

TO DATE, MULTIPROCESSING has sparked interest only among those whose professional lives are dominated by compute-intensive tasks such as Photoshop image manipulation or QuickTime-movie creation. Until now, only one vendor, DayStar Digital, has offered MP systems. The high cost of DayStar's Genesis MP four-processor Mac clone has discouraged all but the most power-hungry. And only a handful of applications have taken advantage of MP.

But this picture is beginning to change. Apple has now joined the MP bandwagon, with a dual-processor configuration of its top-of-the-line Power Mac 9500 (see the Reviews Special Report, in this issue). UMAX Computer recently announced a dual-processor version of its SuperMac system. And although Power Computing hasn't unveiled any specific plans to deliver an MP system, it has long been on record as being interested in the technology.

Apple has also upped its evangelism efforts on behalf of MP. Expect to see several new MP-savvy applications by early next year. Furthermore, Apple itself is taking advantage of MP in compute-bound portions of the Mac OS. QuickTime 2.5 will utilize multiple processors when they are available, as will QuickDraw 3D 1.5.

When Mac OS 8 ships, multiprocessing will get another major boost. With its SMP (symmetrical multiprocessing) capability, Mac OS 8 will bring the benefits of multiple processors to the mainstream. SMP enables each processor to operate independently, so an MP system can literally perform several tasks simultaneously. (Today, all the processors in an MP Mac must work in tandem on the same single task, such as a Photoshop-filter calculation, under the direction of one of the processors.) By the end of 1998, look for dual processors to be standard even on Performa models and for high-end Macs to sport 8, 16, or more processors.

HARDWARE

Motorola and IBM, which manufacture PowerPC chips, expect to be able to deliver even higher speeds by the end of 1996, and the PowerPC partners are predicting 300-MHz processors by the end of 1997. Another manufacturer, Exponential, is reportedly working on a 500-MHz PowerPC processor.

Next 6 Months	Next 12 Months	Someday . . .
▶ 240-MHz PowerPC	▶ PowerPC Platform	▶ USB
▶ Dual-processor Power Macs	▶ 300-MHz PowerPC	▶ FireWire
▶ CD-ROM drive for PowerBooks	▶ Ultrafast PowerBooks	▶ 500-MHz PowerPC
	▶ 20th-Anniversary Mac	▶ 8- to 16-processor Macs

Innies and Outies

It's all well and good to build personal computers with the fastest processors around. But high-speed chips can go only so far if the pipelines bringing data in and out are too narrow to keep up. That's why big changes are coming not only to your Mac's innards but to its backside as well.

Simply put, your Mac's selection of ports is about to broaden, big time. The upcoming PowerPC Platform (PPCP) will include PC-flavored ports, such as a parallel-printer port and a pair of PS/2 mouse and keyboard serial ports, along with the standard Apple ports.

Could This Be Your Next Power Mac?

Not likely. However, this design concept, code-named Sweep, does give a tantalizing glimpse of what the visual impact of designer Macs — such as the 20th-Anniversary Mac, planned for release in 1997 — could be like.

Two new serial ports —the USB (universal serial bus) port and IEEE-1394 (also known as FireWire) port — will also soon appear. The result will be that the back of your next Mac may very well be honeycombed with ports: SCSI, modem, printer, sound-in, sound-out, parallel, ADB, PS/2, USB, FireWire, Ethernet — maybe even a PC-compatible joystick port.

Don't worry, though. This plethora of ports will merely be a transitional step while peripheral vendors move to the USB and FireWire standards. A single USB port can accommodate up to 127 devices and operate at 12 Mbps — plenty fast enough to accommodate your keyboard, mouse, modem, ISDN connection, joystick, and floppy-disk drive. Unlike the PS/2 serial system, the USB system is both fast and daisy-chainable. Unlike with ADB, you can plug and unplug peripherals without turning off your computer. All Apple has to do is supply the necessary driver software.

FireWire is a different story. Apple is firmly behind this high-speed connection scheme — it invented it, after all — but the rest of the personal-computer industry is more cautious. Apple has promised that FireWire will be its primary high-performance I/O scheme, beginning in the first half of 1997, when it will bundle FireWire adapter cards with its high-end systems, and culminating in 1998, when many Mac motherboards will contain FireWire ports.

FireWire, like USB, is a bus architecture that permits up to 127 devices, but it's quite a bit faster and is thus better suited for connecting to digital-video cameras, scanners, printers, and even hard-disk drives. Current FireWire control chips are able to handle data at a rousing 400 Mbps (megabits per second). Even if you take overhead into account, that's well over 40 MBps (mega*bytes* per second), or about the same speed as that of Fast-and-Wide SCSI-2.

At the same time, take Apple's claims of 800 Mbps in 1998 and 1,600 Mbps in 1999 with a dose of healthy skepticism. An 800-Mbps standard doesn't even exist yet, and a 1,600-Mbps one is just a gleam in the eye of Apple marketing folks.

CHRP Arrives, a Little at a Time

By now you've no doubt heard that the CHRP (Common Hardware Reference Platform) is coming, most likely under a new moniker — PPCP. The PPCP is a system-design specification worked out by IBM, Motorola, and Apple for systems that are capable of running six operating systems: the Mac OS, Windows NT, OS/2, AIX (IBM's version of UNIX, now being used by Apple too), Solaris (Sun's version of UNIX), and NetWare.

For most Mac users, though, being able to run a bunch of intimidating operating systems in the same box as the Mac OS isn't what makes the PPCP exciting. Rather, it's that the PPCP spec is an open one: Any company that wants to can design and market a system based on the spec, using processors and chip sets that will be available from several sources. In short, the PPCP will give you more and different

THE VERDICT Macintosh Hardware

APPLE'S HARDWARE PLANS are the strongest part of its current product strategy. Power Macs are now arguably faster than the best Wintel systems. And the Mac OS is well positioned to become the first desktop OS to support multiple CPUs.

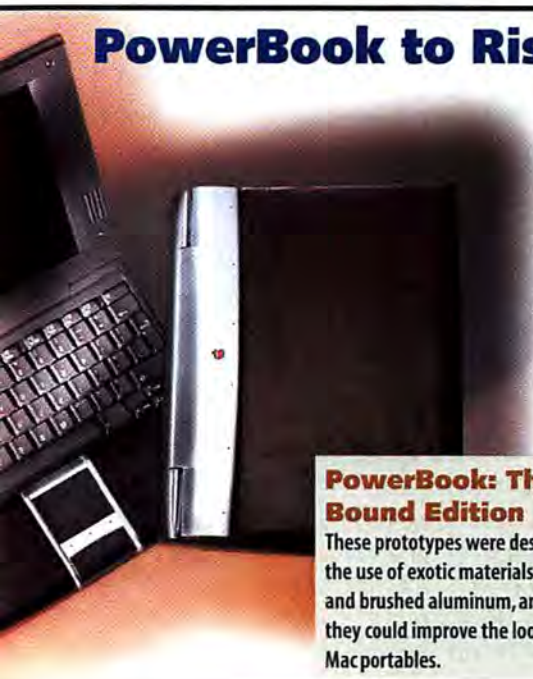
But there's always room for improvement. We've got two bits of advice for Apple on the hardware front. One, change the approach to marketing upgrade cards. What Apple has now are a couple of midrange upgrade cards, for too much money. Instead, it should offer upgrade cards at both ends of the current processor-speed range: cards with the highest of the high-end processors, for those willing to pay a premium, and cards with yesterday's top-of-the-line processors at bargain prices.

Two, improve the Mac's internal design. The Power Mac 9500 and 8500 are too difficult to get inside. The 7600 is vastly better. Take it further. *Everything* upgradable should either slide or snap in. Other vendors have been doing it for years.

Otherwise, we like what we see in Apple's future hardware. The return of strong industrial design, the hopefully successful resurrection of the PowerBook, the continuing increase in processor speeds, and the adoption of industry standards such as those embodied in the PowerPC Platform. These should help continue to make the Mac the most recognized computer brand.

PHOTOGRAPHY / ADRIAN ORDENANA

PowerBook to Rise from the Ashes



PowerBook: The Leather-Bound Edition
These prototypes were designed to explore the use of exotic materials, such as leather and brushed aluminum, and to see whether they could improve the look and feel of future Mac portables.

IF THERE EVER WAS A POSTER CHILD for Apple's recent difficulties, it would have to be the PowerBook 5300. However, if the company's portable-computer plans are any indication, the best thing we could wish for Apple is that the rest of its business be as together as Apple's future PowerBooks look to be.

The climb out of the hole the 5300 series dug for Mac notebooks is going to be a long one. And although we promised Apple we wouldn't preannounce the next PowerBook model, we can tell you about some features the company thinks would be "good ideas" for future Mac portables.

For example, Apple now agrees that integrating a 5.25-inch CD-ROM drive is a good idea. In fact, PowerBook aficionados can expect to see a CD-ROM-drive option sooner rather than later.

Further down the road, users can expect PowerBooks to get fast — real fast. We've already told you about 603e chips running at 200 MHz. One of the goals for the 603e was low power consumption, ideal for mobile systems. You figure it out. A new memory controller and I/O subsystem should also help, with DMA support for PC Cards, SCSI, IDE, sound, and serial I/O. But don't expect to see these goodies until sometime in 1997.

Also on the list for next year is more expandability. Does an internal PCI slot sound tempting to you? Stay tuned. How about an L2 cache? IrDA-compliant infrared communications? Larger, sharper color displays? Apple says that these are the kinds of ideas it is exploring for the future. The goal is simple — give users a no-compromise Mac in a portable package. (Note that the word *Mac* figures prominently in Apple's PowerBook rhetoric.)

That's about all we're at liberty to divulge. Let's just say that Apple doesn't want to repeat the experience it had with the 5300.

models to choose from than are available today, from an expanded set of vendors.

Today, Mac OS licensees must also license one of Apple's motherboard designs. They can make minor modifications, but they are stuck with the same proprietary chip sets Apple uses — currently, there's no other way to make a working Mac clone.

When the chip sets specified by the PPCP become widely available, the number of clone vendors is likely to grow (count Motorola and IBM among them). The open PPCP spec gives clone makers much more freedom to pick and choose the specific hardware they want to use, to find ways to innovate, to differentiate their products — and to cut costs.

Apple has said publicly that it intends to deliver its PPCP-based Power Macs as soon as possible. Don't expect to see anything this year, however (see "Longer Wait for Multiple-OS Mac," in this issue's News section). And don't assume that Apple plans to aim PPCP systems at its most demanding professional Mac customers. Quite the contrary. The first PPCP-based Power Mac will probably be a midrange configuration targeted mainly at entities such as colleges and big businesses. Through the course of 1997, the PPCP will move throughout the Mac lineup. Eventually — say, sometime toward the end of 1998 — Apple hopes to have the PPCP as the standard platform for its entire Macintosh product line.

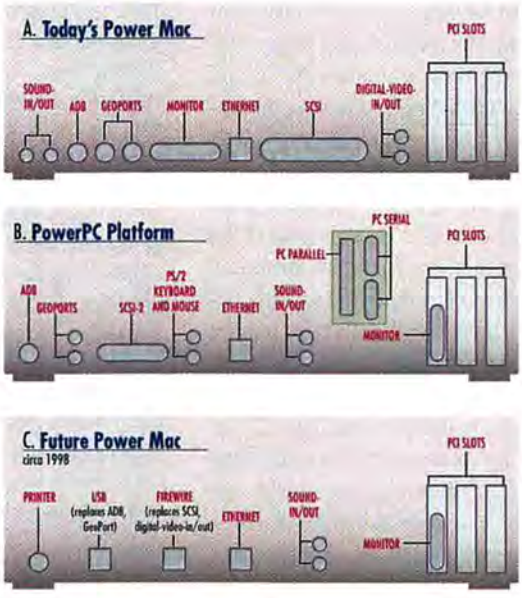
Efforts around the PPCP aren't limited to the Mac OS alone. Apple's recently formed Alternative Platforms Division also plans to use the reference platform in its line of non-Mac-OS-based servers. This will likely be the first (but perhaps not the only) place users will be able to buy a machine containing both Windows NT and an Apple logo. Imagine that.

Designs for Better Living

Apple has won more awards for industrial design than any other major personal-computer vendor, although it would be hard to tell based on its current crop of shipping designs.

We were recently invited down to take a peek in Apple's world-renowned product-design lab and preview the future. We even got to take pictures of some concept designs, which are scattered throughout the pages of this report. (Please note that none are real products. In fact, according to Apple, these designs are downright pedestrian compared to the products these concepts are helping give rise to.)

Based on what we saw and heard, users can expect the company to quickly — and dramatically — reverse its recent slide into producing boring Mac chassis. For your first clue about the shape of Macs to come, check out the Performa 6400 (see "Star Performa," in this issue). Then prepare yourself for the 20th-Anniversary Mac.



Port Mania

Mac users have become familiar with the standard set of I/O ports (A). When PowerPC Platform systems begin to arrive early next year, Macs will sport a full set of PC ports (B). These additional ports are for use with non-Mac OS operating systems, such as Windows NT, support for which is required in order for a system to be certified PPCP-compliant (Mac-clone vendors may choose to write drivers to make the PC ports accessible by their hardware). Some vendors may supply PC (or Mac) ports on an optional daughtercard. Sometime in 1998, the port situation should settle down. That's when USB and FireWire ports will replace many of today's common ports (C).

PHOTOGRAPHY / ADRIAN ORDENANA

PIPPIN & NEWTON

IT SEEMS EVERYTHING OLD is new again at Apple these days. Take, for example, the new Information Appliances Division. The group was recently formed to develop the next generation of information-access devices. Sound familiar? It should. Just a couple of years ago, Apple had a division called PIE, or Personal Interactive Electronics, which was assigned the same mission.

Newton Ascending

PIE shipped only one product in its brief tenure — the original MessagePad. The Newton is also part of the Information Appliances Division's lineup. But things have changed since the bad old days when PIE was hawking the Newton as everything from a handheld digital secretary to a bread maker. These days Apple's PDA has settled quite nicely into two niches: next-generation personal organizer and vertical-market platform.

The arrival last December of the Newton 2.0 operating system brought a more stable and functional user experience to the Newton platform (not to mention handwriting recognition that really worked.) According to Apple, the challenge it is currently facing is to bring the hardware up to speed — literally.

StrongARM is a low-power RISC processor jointly developed by Digital Equipment, Advanced RISC Machines (ARM), and Apple. The first StrongARM chip to arrive, at a mere 160 MHz, will be ten times as fast as the 20-MHz ARM 610 in current MessagePads. It also uses significantly less power than the 610, which was already a very low-power chip.

And it's coming to the Newton, sometime in 1997. Not only will the StrongARM make the Newton OS run very, very fast but it will also enable new tricks: real-time handwriting recognition; instant switching among applications; blindingly fast scrolling; double the current MessagePad's battery life; and, eventually, voice recognition. All this from the very first chip in a series that is expected to quickly reach speeds in excess of 200 MHz.

The future of the Newton isn't just about faster processors. It's also about better boxes. Although Apple wouldn't be specific, the company did say that there would be new Newton form factors next year and that at least some of those designs would target specific markets, such as education. Future Newton hardware will support IrDA-compliant infrared connections to desktop computers and printers; it will also offer better viewing with grayscale screens.

There will be improvements to software as well. Apple's recently shipped Newton Internet Enabler will get security, PAP, CHAT, and intranet capabilities. Apple will also finally deliver its desktop-data-integration software, The Newton Connection Utility. It may even offer support for automatic synchronization.

And, just so you don't think that Apple has given up on licensing, the company is hard at work on developing a Newton reference platform. When complete, it will allow Newton licensees to design their own hardware instead of having to OEM an already shipping Apple design.

Designer Newtons

Apple's reinvigorated Newton efforts are likely to spawn new products in a variety of shapes; sizes; and, yes, colors. A slate-sized Newton could do everything a portable computer does today. Future Newtons could also get smaller — a lot smaller — and may even introduce new materials, such as removable see-through plastic panels.

The Video Game That Thinks

Also among the Information Appliances Division's products is the Pippin — the Mac OS computer that comes in game-console clothing. Although Apple was less forthcoming about the Pippin's future, the company did give us a tantalizing glimpse into what we might see in the years to come.

First, to clarify a rumor. It's true Apple may put its multicolored logo on a future Pippin box, but it's not true Apple will build that box. According to the company, Pippin is about licensing and all Pippin-

	Next 6 Months	Next 18 Months	Someday . . .
NEWTON	▶ Desktop synchronization	▶ 160-MHz StrongARM ▶ New markets, form factors	▶ Voice recognition ▶ OEM platform
PIPPIN	▶ First U.S. release	▶ 2-D, 3-D acceleration ▶ DVD	▶ MPEG-2 ▶ FireWire

THE VERDICT Pippin & Newton

THE ARRIVAL OF the Newton 2.0 operating system, late last year, went a long way toward rehabilitating the PDA's sullied reputation. Now it looks as if the combination of the 160-MHz StrongARM processor with updated hardware, even better handwriting recognition, and a greater selection of form factors will finally catapult Newton OS-based devices back into the limelight. In fact, it may be that with ten times the speed and a more readable grayscale screen, the Newton could become a smaller, faster, and easier-to-use alternative to current portable computers.

The Pippin, on the other hand, doesn't seem to have found its niche just yet. It's clear from its current form factor and functionality that the Pippin is going to have to compete with game consoles, whether Apple thinks it's a game machine or not. But as a game platform, the Pippin is pretty much a washout.

Bandai's @World, the first Pippin-based device to be announced, will likely cost three times as much as a Sony PlayStation in the U.S. and yet won't hold a candle to it in terms of pure pixel-pushing performance. And let's face it: If, as Apple says, the Pippin is "all about media," then graphics performance is going to be one of the main criteria that determine whether it succeeds or fails, especially in the graphics-obsessed U.S. consumer market.

Not that the Pippin doesn't have some things going for it. Its video-convolution and -scaling technology has no peer. Basically, the readability of Pippin output on the family television is as good as that of a low-end computer monitor. And, we're sure the eventual arrival of DVD drives, MPEG-2, and 2-D- and 3-D-acceleration hardware will make the Pippin a very competitive platform. We're just not sure Apple and its partners can wait that long for the Pippin to take hold.

based machines, now and in the future, will be built by licensees.

Now, to the goodies. Apple says most of the changes in future Pippins will extend the current design. For example, users can expect to see DVD players (for more on DVD, see the "DVD: The Next Big Thing [Really!]" sidebar, in the Media and Imaging section of this report), support for MPEG and MPEG-2 compression, Surround Sound, and maybe even AC3 sound technology. The Pippin will also jump on the FireWire bandwagon; FireWire is especially useful for interfacing with digital-video cameras. Pippin hardware will see the addition of 2-D and 3-D acceleration in 1997. And faster processors are down the road.

Game or Computer?
The Bandai @World, the first announced Pippin-based device, looks more like a game console than a computer. But its relatively slow graphics speed probably won't make it a first choice among buyers interested only in games.

NETWORKING

APPLETALK NETWORKING has been built into the Mac since the first 128K model. Initially designed to let users share printers, AppleTalk has grown, over the years, to include support for file servers, personal file sharing, large-scale networks, remote access, and (if you include PowerTalk) electronic-mail and directory services.

But the days of proprietary protocols such as AppleTalk are over. The future of Macintosh networking lies in the Internet. Apple will maintain support for many of AppleTalk's features in future OS versions — AppleTalk remains well suited for small workgroups, where Macs are popular — but the company is moving to integrate a full range of Internet services into the Mac OS.

Although most Internet content is developed on Macs and although Apple Workgroup Servers running WebSTAR are among the most popular Web servers, the Macintosh isn't going to survive as the favored Internet platform on the strength of these markets alone: It needs to be a hot client as well. Unfortunately, the Mac's Internet client-software offerings to date represent little more than a me-too effort. Apple has a lot of work to do, both to more fully support Internet protocols and to deliver end-user Internet services.

On the protocol front, some work has already been done. MacTCP has been available from Apple for several years. Open Transport includes AppleTalk-protocol as well as TCP/IP stacks. And as we go to press, an Open Transport version of PPP (Point-to-Point protocol, used for remote access) is in beta.

AppleShare's Future

APPLESHARE WILL BE GETTING an Internet makeover later this year, when Apple ships the new version of its venerable server software. Code-named FutureShare, the new package will include updated versions of the file-, print-, and multiport-remote-access-server applications contained in the current version (4.2.1) of AppleShare. In addition, it will include several new IP-based services:

- Support for AppleShare (AFP) over IP. FutureShare will let users mount AppleShare volumes on their Mac desktops over TCP/IP connections.
- FTP server software. This will be for those who want to provide FTP access to shared files on an AppleShare volume.
- SMTP/POP 3 mail-server software. Something is going to have to replace PowerTalk, right? It might as well be the accepted, standards-based mail services.
- HTTP server software. No, it's not WebSTAR, but a high-performance homegrown server application that supports WebSTAR plug-ins, aimed primarily at intranet applications (such as publishing an HTTP-based form on your network).

Apple will also ensure that users have access to the necessary client software for all these services. Those client functions not shipped with the Mac OS itself will be bundled with FutureShare.

And in case you're wondering, personal file sharing will eventually work over IP too, but not until later — probably a lot later.

As for fuller integration of end-user Internet services, Apple has put most of its energy to date into Cyberdog (see "Walking the Cyberdog," July '96, page 69). Based on OpenDoc, Apple's component-software architecture, Cyberdog is a collection of independent software modules called *parts* that provide Web browsing, e-mail, news, FTP, and other Internet services.

Apple is working to integrate the Internet in other ways as well. For example, ARA (Apple Remote Access) currently provides access to file servers and printers only via AppleTalk. The next version of ARA (3.0) will enable users to place a single call that can connect to AppleTalk as well as to IP network services. And with the next release of AppleShare, Apple will support IP file services within the Finder (see the "AppleShare's Future" sidebar).

Apple's Internet ace in the hole, however, comes from another quarter entirely: its lead in multimedia. Content providers are looking for ways to deliver a richer Web experience to users, and such capabilities as QuickDraw 3D, QuickTime, and QuickTime VR offer precisely what they need. Apple is hard at work on optimizing these technologies for the Web.

With version 3.0 of its Navigator browser, Netscape will bundle a plug-in that supports the playing of QuickTime movies within a Web page. The plug-in contains a "fast start" feature that enables users to begin playing a movie almost immediately, before it has been completely downloaded, and to continue playing it in the foreground while new data arrives in the background.

AND THE INTERNET

Java is also a hot item on Apple's to-do list. By the end of this year, Apple will ship a Java "virtual machine," the software needed to run Java applets, for the Mac. A Java virtual machine will also be built into version 3.0 of Netscape Navigator for the Mac. Apple currently bundles Navigator 2.0 as part of the Internet Connection Kit, which ships with all desktop and education Macs and is included in the System 7.5.3 retail package, and updates the kit whenever new versions of Navigator are released.

Expect also to see support for Java within OpenDoc, in the form of a Java "wrapper" part. With OpenDoc and the Java wrapper part installed, you'll be able to run Java applets as stand-alone programs or embed and run them within any OpenDoc document.

Users not only consume information on the Web but want to publish it as well, so look for personal-Web-server capability in a future version of the Mac OS. Like System 7's file sharing, the Mac's personal Web server software won't be industrial-strength or have all the latest bells and whistles, but it will allow individuals and small businesses to easily create a presence on the Web. Don't expect this capability before the arrival of Mac OS 8.

One final area in which Apple is working to improve users' experiences is that of directory services. Apple first delivered this capability as part of PowerTalk. PowerTalk never took off, however, and will be dropped from the Mac OS in the upcoming Harmony release (see "The Macintosh OS," in this report). Apple's goal is to provide a system-wide database of information about individuals and businesses — names, physical and electronic addresses, phone numbers, and so on — that other parts of the OS and third-party applications can use.

If third-party developers buy into the scheme — they never did with PowerTalk's directory services — users will be able to use the same set of address information for all of their various e-mail activities, within their PIM calendars and address books or anywhere they need to include contact information. In this way, the dream of universal electronic business cards may become reality. Apple hasn't yet decided how it's going to replace PowerTalk directory services, but one thing is for certain: Whatever method it chooses will be based on industry standards, not on proprietary protocols. Versit's V-card specification is one possibility. However, don't look for this capability before OS 8 either.

THE VERDICT Networking & Internet

THERE'S NO QUESTION that Cyberdog, Apple's OpenDoc-based collection of Internet-access software, is an intriguing development and promises tighter integration of Internet functions into the desktop. But for Apple to rely on Cyberdog as the primary vehicle for delivering Mac Internet client services is risky. If Cyberdog is to succeed, OpenDoc has to become widely adopted. And that is far from guaranteed. OpenDoc is untried, unproven, and full of rough edges. Two years from now, it may be The Hot Thing. Right now, it's an experiment. And although OpenDoc may succeed in the long run, it's going to be a long transition — maybe too long for the fast-evolving world of the Internet.

We're not saying that Apple shouldn't believe in the future of OpenDoc. But believing doesn't make it so. If Apple wants to make the Mac the premier Internet platform, it has to take a two-pronged approach: offer Cyberdog-based functions for OpenDoc's early adopters and provide a parallel set of Internet functions not based on OpenDoc, for the more conservative among us.

As to the pending death of AppleTalk, we couldn't be happier. AppleTalk was a great networking protocol in its day, setting a standard for ease of use that has yet to be eclipsed. But with that ease of use came a significant handicap — all the overhead associated with making AppleTalk easy also virtually guaranteed that Mac networking would always be slower than the equivalent PC connection.

IP is a huge opportunity for Apple. Not only will adopting the standard speed things considerably on Mac networks but it will also give the company the chance to bring its much vaunted ability to make things easy to the hardest-to-configure networking standard in the world. Who knows? If Apple really does its job right, it might be able to make its flavor of IP the industry favorite. Let's just hope that support for multiple platforms fits somewhere in Apple's plans.

PHOTOGRAPHY / JIM KARAGEORGE

MEDIA AND

LONG THE FAVORITE PLATFORM of desktop publishers, the Mac is fast becoming the desktop computer of choice for a broad range of media-content creators. Technologies such as QuickTime, QuickTime VR, and QuickDraw 3D have helped push Apple to the forefront of the converging publishing and multimedia- and Web-authoring markets.

3-D — Virtually Everywhere

Of all the areas in which Apple is investing in new media technologies, and there are many, 3-D is probably the hottest. Its popularity is being fueled by the explosive growth of the World Wide Web, where content providers are hungry for ways to deliver a richer interactive experience. Add to this the ever increasing speeds of PowerPC processors, which make dramatic 3-D experiences on even low-cost desktop machines possible, and you have a powerful combination.

Because version 1.5 of Apple's QuickDraw 3D, which was due this summer, is extensible, it lays the groundwork for exciting new capabilities currently under development in Apple's Advanced Technology Group. For example, the ATG is looking at ways to break up complex 3-D models into multiple small files that can be loaded individually and cached locally, to improve transfer speed over low-speed modem connections.

Work is also progressing on a 3-D feature called *levels of detail.* Using this scheme, an object can be represented by any of several 3-D models, from very simple to very complex. When viewed "from a distance," an object is displayed by use of a simple model, which can be rendered quickly. As a user moves "closer" to the object, increasingly complex models with more detail are displayed. Both of these capabilities will be delivered as plug-in extensions to QuickDraw 3D 1.5.

QuickDraw 3D is also finding a home in QuickTime. Version 2.5 of QuickTime, which was expected this summer, will contain QuickDraw 3D tracks. Movie creators will be able to place a 3-D model in a QuickTime movie, along with a set of animation instructions. QuickTime will render the model as the movie plays (saving the movie's author from having to render it ahead of time).

Games are one software category where developers are chomping at the bit to utilize new 3-D capabilities. For example, Bungie, maker of Marathon, is at work on a new action game that takes the use of 3-D technology to unprecedented heights. In what is likely to be the Next Hot Game, everything — characters, walls, the ground — will be rendered 3-D objects, resulting in an increased sense of realism. One innovative feature in the next version of Marathon will allow players to capture images of their faces (using scanned photos or a QuickCam camera) and texture-map them onto the head of their character.

To support such new 3-D features, users will most likely want 3-D-acceleration hardware in their Macs. Apple has a plan to provide it. Already on the price list is a pricey QuickDraw 3D Accelerator Card for PCI. Expect high-end Performa models with bundled 3-D acceleration by the end of 1996. By the end of 1997, all but the lowest-cost

QuickTakes of the Future
These concept models show two paths along which future digital cameras from Apple could evolve. One (top) shows a QuickTake-like still-image camera in a binocular-style case. The other is more reminiscent of a Casio video camera and could serve as a capture device for still and moving images.

DVD: The Next Big Thing (Really!)

RODNEY KING SAID IT BEST: "Can't we all just get along?" Apparently not in the digital realm. Standards squabbling is delaying the introduction of The Next Big Thing in multimedia content delivery: DVD. In fact, the bickering even extends to what the acronym *DVD* stands for: Is it *digital video disc,* as it was called back in late 1995, when a DVD standard appeared imminent, or is it *digital versatile disc,* as the manufacturers developing the standard now call it? How about *delayed voluminous delivery system?*

By improving on the track and pit density of CD technology, DVD can pack a full 4.7 GB of data onto one side; two-layer DVD discs (a nifty new optical technology allows a DVD drive's laser-equipped read heads to "see" two layers of data) will hold 8.5 GB; two-sided, two-layered discs will hold 17 GB. That's over 26 times the capacity of a CD-ROM.

Even a single-sided DVD disc has more than enough room for a digitized full-length movie — including eight tracks of Dolby AC-3 audio and up to 32 different sets of subtitles. With all this storage room on a cheap, compact, plastic disc, DVD technology is well positioned to replace not only the CD-ROM but also the audio CD, the VHS cassette, and the laserdisc. In a couple of years, write-once DVD-R systems will make CD-R obsolete; erasable DVD-RAM systems are also on the drawing board, but don't hold your breath.

DVD is fast too. A DVD drive's data-transfer rate (1.35 MB per second) is equivalent to that of a 9x CD-ROM drive. The most popular speed for CD-ROM drives these days is 8x.

Just as it almost single-handedly made CD-ROM drives as common as floppy drives, Apple plans to push DVD hard. Its goal is to make the new standard pervasive as quickly as possible. Expect to see DVD drives ship with Performas in the first half of 1997 and as standard equipment throughout the Power Mac desktop line by the end of that year.

IMAGING

Next 6 Months	Next 18 Months	Someday . . .
▶ 3-D acceleration in high-end Performas	▶ 3-D acceleration in all Performas	▶ QuickDraw GX for Windows
▶ Easier-to-use digital cameras	▶ Scanner-to-HTML capability ▶ Intelligent digital cameras ▶ Interactive QuickTime	▶ Digital-camera OS

Performas will have it. Desktop models will be later to have 3-D hardware incorporated, but several high-speed third-party acceleration cards will be available to boost speed for those who author content.

Dimension GX

The third dimension isn't everything, though, nor is the Web (despite what some pundits tell you). People do still create documents for which the ultimate destination is not an electron but wood pulp.

Apple continues to develop improvements to technologies that make the Mac the darling of desktop publishers. Version 2.1 of ColorSync, Apple's color-matching software, will be available by the time you read this. It adds support for named-color systems, such as Pantone, and for paint names, fabric colors, and even Crayola crayons. The new version also enables color matching for hi-fi color systems (those with more than the traditional four color channels), such as Pantone's six-color Hexachrome system.

And then there's QuickDraw GX. GX is gaining acceptance in Asia, where its typographic abilities solve fundamental problems for languages that have extended character sets and where cross-platform issues are not as important as in the U.S. But in the U.S., adoption of GX, despite its advanced typographic features, has been seriously hampered because the technology is available only for the Mac.

The good news is that Apple has finally admitted that this is a problem. The bad news is that it still hasn't decided to solve this problem by porting GX to Windows. Instead, Apple has decided that it's going to decide by the end of the year: Either it will port GX to Windows, or it will give up on GX. Stay tuned on this one.

Image That

Meanwhile, over in the Imaging Division of Apple, engineers are finding new ways to make scanners, printers, and digital cameras more interesting. Of particular note in the digital-camera field is QuickTime IC (Image Capture), an API (application-programming interface) designed to standardize and improve the interaction between computer software and the images stored in digital cameras. QuickTime IC includes such functions as camera control, image viewing, image editing, and sound annotation.

Besides extending the functionality of digital cameras, QuickTime IC should also save camera developers money. Right now, each camera vendor is required to develop its own firmware for basic camera functions. With QuickTime IC, those basic functions will already be covered. And because the IC standard is extensible, vendors will be able to add their own technologies on top of it, to differentiate their products from those of competitors that also use QuickTime IC. Look for cameras and applications that support this API by the end of 1996.

Work is also under way to develop an operating system for digital cameras that is based on QuickTime. A camera running this multitasking operating system would have its own processor, memory, and file system. One of the advantages of this approach: Users won't have to wait while their cameras process an image before they shoot another one. Look for the appearance of cameras running this new OS in the second half of 1997 — and not just from Apple.

We'd love to tell you more about what we learned is happening with scanners and printers too — but we promised not to. Here's a bit of a teaser, though: What would you think of scanner software that could scan a page of text, perform OCR on it, and convert the result automatically to HTML? How about scanning a page of mixed text and graphics and spitting out a PDF file? Seem like good ideas to us.

Hyperactive QuickTime

Another topic about which Apple doesn't have a lot to say — but what it is willing to say is very intriguing — is the future of QuickTime.

After the successful debut of QuickTime 2.5 (see "Q", September '96, page 63), which added a laundry list of new features for professional video production and finally made fully functional QuickTime available for all major platforms, Apple is turning its attention to interactivity. Interactive QuickTime will allow media authoring tools to export interactive content to a single file that will then be able to play on any platform that QuickTime supports (including Windows 3.1, 95, and NT systems).

Apple has also said that the venerable, but long neglected, HyperCard will be reborn as an Interactive QuickTime authoring and playback tool. We're sure the many long-suffering fans of Apple's HyperTalk toolkit will also be happy to hear that the QuickTime-savvy HyperCard will address many standing woes — it will include a ground-up rewrite that will make HyperCard a PowerPC-native application.

THE VERDICT Media and Imaging

APPLE APPEARS TO BE making the right moves to maintain the Mac's lead in publishing, multimedia, and Web authoring. Its efforts with QuickDraw 3D and QuickTime, for example, rank among the company's greatest success stories.

There are some disconnects, though. We won't belabor the QuickDraw GX fiasco, much as it deserves it. Instead, take the example of OpenDoc, which Apple is pushing as the future of software as it relates to desktop publishing.

You'd think that a software architecture based on compound documents would be a natural for DTP. But if you ask around among vendors of high-end publishing software, no one seems very interested. One reason is that OpenDoc currently can't do color separations on parts embedded in a document.

Due in large part to QuickTime's remarkable ability to be all things to all applications, Apple is well positioned to be the leading purveyor of low-level software for controlling digital cameras. And although we can't help but feel there's a little "miracle happens here" cloud in the QuickTime IC blueprints, the idea of a single, standard OS for digital cameras certainly makes sense. As to Interactive QuickTime, all we can say is — duh! We're just wondering why it took Apple so long to realize that adding interactivity to the leading multiplatform media standard was a no-brainer.

PHOTOGRAPHY / ADRIAN ORDENANA

THE MACINTOSH OS

ORIGINALLY SCHEDULED FOR RELEASE in mid-1995, Mac OS 8 (formerly known as Copland) is now due out in mid-1997. At least, that's the official word from inside Apple. Realistically, it's unlikely that the new OS will be "final" before early 1998. That's a long time to wait for a major operating-system upgrade that's as badly needed as Mac OS 8 is.

Fortunately, Apple has decided to fill the otherwise barren landscape between System 7.5 and System 8 with an interim release, codenamed Harmony. Harmony will be based on System 7.5 but will incorporate several features that were originally slated for Copland. This upgrade should arrive in the first half of 1997, hopefully closer to New Year's than to Memorial Day.

Living in Harmony

At press time, company officials were still in the process of nailing down exactly which features will make the cut in Harmony. Because Harmony's new features were intended for Mac OS 8, they were built on the assumption that OS 8's underlying architecture would be available. Now Apple engineers need to go back and see what can be extracted and reconstructed on 7.5's foundation and what is too intimately tied to OS 8's.

A few things are definitely in. Harmony will integrate OpenDoc; OpenDoc Essentials (see the "OpenDoc: Too Little, Always Late" sidebar); and Cyberdog, Apple's OpenDoc-based suite of Internet components. Java support, due for release before Harmony, will also be built into the operating-system update. And Harmony will sport a new look for menus, buttons, scroll bars, and the like. The new look will be the default interface from OS 8 — similar to today's Mac desktop but with interface elements that use 3-D treatments to help them pop off the screen.

Several things will definitely be out as well. PowerTalk, for example, will be dropped, although Apple is looking into providing a way to preserve the information users may have stored in PowerTalk's electronic business cards. Also, features tied closely to OS 8's foundation technologies — such as the new microkernel, preemptive multitasking, and symmetrical multiprocessing — won't make the Harmony cut either. Users will have to wait for 8 to get some hot interface features such as the V-Twin-based find-by-content capability, the scalable Finder, user-selectable desktop themes, and multiple user profiles. Improved Open and Save dialog boxes are also unlikely to arrive before OS 8.

On the maybe list are a host of interface changes, such as pop-up folder tabs on the desktop, spring-loaded folders, enhanced list views for folder windows, and a hierarchical New File-menu item. A multithreaded version of the Finder, allowing you to initiate multiple file copies and empty the Trash simultaneously, is also a possibility.

OpenDoc: Too Little, Always Late

APPLE'S COMPONENT-SOFTWARE architecture, OpenDoc, has been a promised feature of the Mac OS for longer than most people can remember. Apple reached its first OpenDoc milestone in November 1995, when it released version 1.0 to developers. OpenDoc 1.0 took forever to launch and was a RAM hog. Six months later, there were still no OpenDoc "parts" available to make it worth a user's effort to install it.

Now version 1.1, which reduces OpenDoc's launch time (a lot) and RAM requirement (a bit), is out. Apple has also produced a set of eight basic OpenDoc parts, collectively known as OpenDoc Essentials, which third-party developers can bundle with their own parts. Third-party parts — basic container apps such as ClarisWorks and Digital Harbor's innovative Wav word processor as well as intriguing plug-in parts such as Adrenaline Software's unnamed spreadsheet and 3-D-charting part — have also begun to appear. And then, of course, there's Cyberdog (see "Walking the Cyberdog," July '96, page 69), Apple's OpenDoc-based compendium of Internet parts.

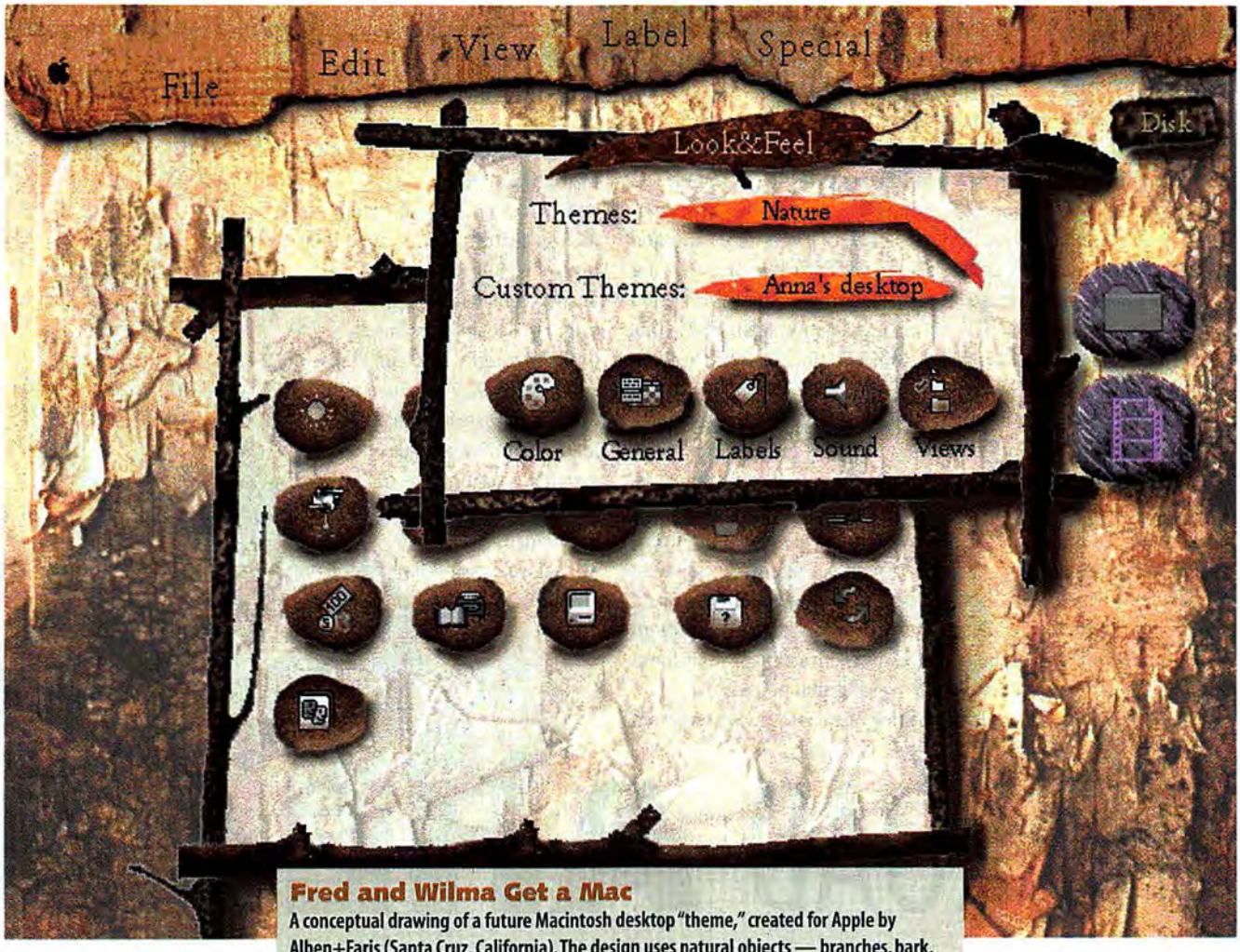
But component software, one of the cornerstones of Apple's vision of the future of Mac computing, has an uncertain future. OpenDoc has tremendous potential. The opportunities it creates for users to construct specialized documents, whether to track sales leads for a business or to design an electronic homework assignment, are awesome. But to date, the reality falls a bit short.

OpenDoc is now bundled with system software: It's part of the System 7.5.3 retail package, as an optional install. Most users will never touch it.

Apple needs something compelling to induce users to adopt OpenDoc. Cyberdog (which is not included in System 7.5.3) could have been it. But at this point, Cyberdog is a toy. Why, for example, would someone use the Cyberdog browser, with its lack of support for plug-ins, when Microsoft Internet Explorer is available for free and Netscape Navigator might as well be?

If Apple wants OpenDoc to take off, it's going to have to deliver, as part of the standard Mac OS, a package of full-featured containers and parts, not a bunch of exampleware users will play with for five minutes and then deinstall.

All that said, there is an OpenDoc Trojan horse. In a version of OpenDoc due for release this fall, Apple will finally deliver a long-awaited function: OLE interoperability. This will mean that any application that supports OLE will in theory also support OpenDoc, albeit in a slightly nonstandard way. The list of apps that support OLE contains some serious heavyweights. Now wouldn't it be ironic if OLE became the vehicle by which OpenDoc achieved its success?



Fred and Wilma Get a Mac
A conceptual drawing of a future Macintosh desktop "theme," created for Apple by Alben+Faris (Santa Cruz, California). The design uses natural objects — branches, bark, leaves, and stones — to represent interface elements. Some objects are too irregular in shape, however, to be implemented in the first incarnation of Mac OS 8's Appearance Manager. (See "The State of 8," August '96, page 69, for more on desktop themes.)

The Magic 8

Meanwhile, the second Developer Release of Mac OS 8 (sometimes referred to as DR1) is due to ship this summer. Although it won't be feature-complete and certainly won't be intended for day-to-day use, it will give third parties a solid foundation on which to start constructing their Mac OS 8-savvy hardware drivers and applications.

And they're going to need as big a head start as they can get. None of the hardware drivers that work today under System 7.5 — drivers required in order to access devices such as hard-disk drives and CD-ROM drives — will work in Mac OS 8. All extensions and control panels will break as well.

As for what the future beyond OS 8 holds, the picture is a bit hazy. When Apple originally announced plans for Copland, it also announced a feature set for the OS that would follow it, code-named Gershwin. And although a group of engineers is still working on how such a distant version of the OS will behave, it's no longer clear that there will be a Gershwin per se. Current thinking in the back rooms at One Infinite Loop (Apple's engineering headquarters) is that after OS 8 is released, Apple will default to a familiar strategy: New features will be rolled out in a steady parade of individual components, with reference releases consolidating those pieces.

THE VERDICT The Macintosh OS

APPLE IS IN A BIT of trouble on the system-software front. It seems that no matter when you inquire about the delivery date of Copland (Mac OS 8), it's always a year off. Meanwhile Harmony, Apple's interim System 7.x release, is as likely to leave users frustrated as appeased.

Many of the items on Harmony's possible feature list are already available from other sources. Aaron, for example, is a shareware extension that imbues a 7.x Mac with an OS 8 rounded-button look. Other features, such as spring-loaded folders and desktop tabs, are available in Now Utilities.

If Apple wants Harmony to be a hit, there's one thing it must deliver: a real Internet solution. Apple's been long on talk about the Internet lately but short on delivery. Sure, it ships the Internet Connection Kit — but that's hardly a stellar solution. Apple's solution has to be built in. This means providing a desktop mailbox for Internet e-mail. It means having an integrated, full-featured browser. It means full support for 3-D, QuickTime, and Java — and anything else hot that drops out of cyberspace in the next six months.

A user with a modem and an ISP account who installs Harmony should instantly be able to have the richest, most complete Internet experience available on any computer anywhere. Anything less isn't going to be good enough.

THE ROAD AHEAD

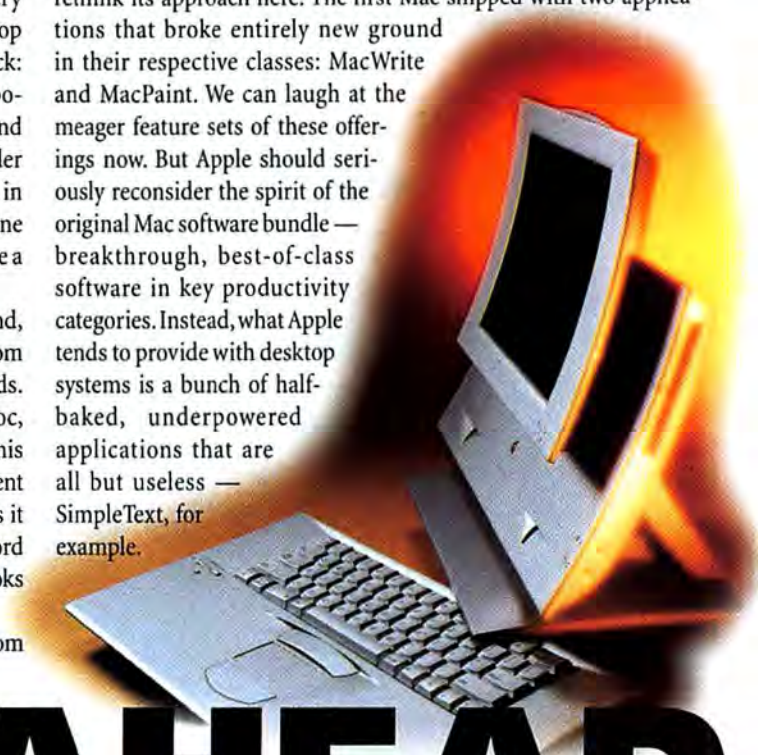
AS WE'VE SHOWN IN THIS REPORT, Apple Computer may be down but it's far from out. The capacity for technical innovation that has characterized the company since its earliest days is still very much in evidence. Particularly with its desktop and education/home models, Apple appears to be on the right track: delivering faster processors at a relentless pace; moving to incorporate 3-D acceleration; laying the foundation for multiprocessing; and perhaps most important, delivering the PowerPC Platform in order to enable a more robust clone market. And from what we've seen in Apple's labs, the company may, within a year, once again have a line of portable computers that can give IBM, NEC, Toshiba, and the like a run for their money.

In the software arena, the picture is more mixed. On the one hand, there are encouraging indications that Apple is moving away from proprietary standards and toward support for industry standards. Its adoption of TCP/IP and its commitment to taking OpenDoc, QuickDraw 3D, and QuickTime cross-platform are examples of this trend. But we hear rumors of new technologies under development that make us wonder whether Apple has fully learned the lessons it should have from PowerTalk and QuickDraw GX. Apple can't afford to continue throwing millions of dollars away on technology that looks good on paper and gives good demos — but that nobody uses.

What this means is that distinguishing one operating system from another will no longer simply be a matter of who's got the superior technology. Instead, the most advanced OS will be the one that does the best job of integrating industry-standard technologies and providing a seamless, intuitive interface. Fortunately for Apple, this kind of stuff is right up its alley. But it has to get more aggressive about and focused on delivering these capabilities.

Take, for example, some of Apple's plans for Mac OS 8. A scalable Finder is a powerful feature. It addresses a fundamental user need: to be able to customize the desktop interface to match the computer-literacy level of different users. The V-Twin find-by-content search engine in OS 8 is another example of technology that delivers immediate benefits to users, by giving them a powerful tool for organizing and keeping track of their information. Conversely, take OS 8 themes — the ability to customize the desktop's visual interface. It's cute. But it's eye candy. It doesn't really help anyone get their work done (although it may help your local consumer-electronics stores sell a lot of Macs).

One more point, about bundled software. Apple needs to radically rethink its approach here. The first Mac shipped with two applications that broke entirely new ground in their respective classes: MacWrite and MacPaint. We can laugh at the meager feature sets of these offerings now. But Apple should seriously reconsider the spirit of the original Mac software bundle — breakthrough, best-of-class software in key productivity categories. Instead, what Apple tends to provide with desktop systems is a bunch of half-baked, underpowered applications that are all but useless — SimpleText, for example.



This has to change. A user buying any Mac, whether it be a desktop model, a portable, or a Performa, should get a solid package of usable productivity software — ClarisWorks, along with the Apple Internet Connection Kit, would be a good starting point.

We've shown you a good deal of what Apple has up its sleeve for the foreseeable future. This is real stuff, not some smoke-and-mirrors demo or catalog of products you'll never be able to buy (except where noted). Although there are clearly some rough spots, we see tremendous promise.

Those who have chosen the Mac as their platform and continue to choose it every time a boss or a friend challenges the logic of not going to Windows still have cause to feel good about that decision. DVD, FireWire, USB, Interactive QuickTime, QuickDraw 3D, the PowerPC Platform, PCI PowerBooks, TCP/IP-based AppleShare, Cyberdog, 500-MHz PowerPC chips, Harmony — the list goes on and on. Apple has been a driving force in the personal-computer industry for well over a decade, and all indications are that it will continue to be for some time to come.

We look forward to seeing Apple navigate its current difficulties and resume its position as an industry leader. After a few months of digging around in the company's technological war chest, we feel confident it will.

Henry Bortman is *MacUser*'s technical director and the most outspoken member of the Loyal Opposition. Andrew Gore, *MacUser*'s editor, and Rik Myslewski, executive editor, also contributed to this report.

PHOTOGRAPHY / ADRIAN ORDENANA

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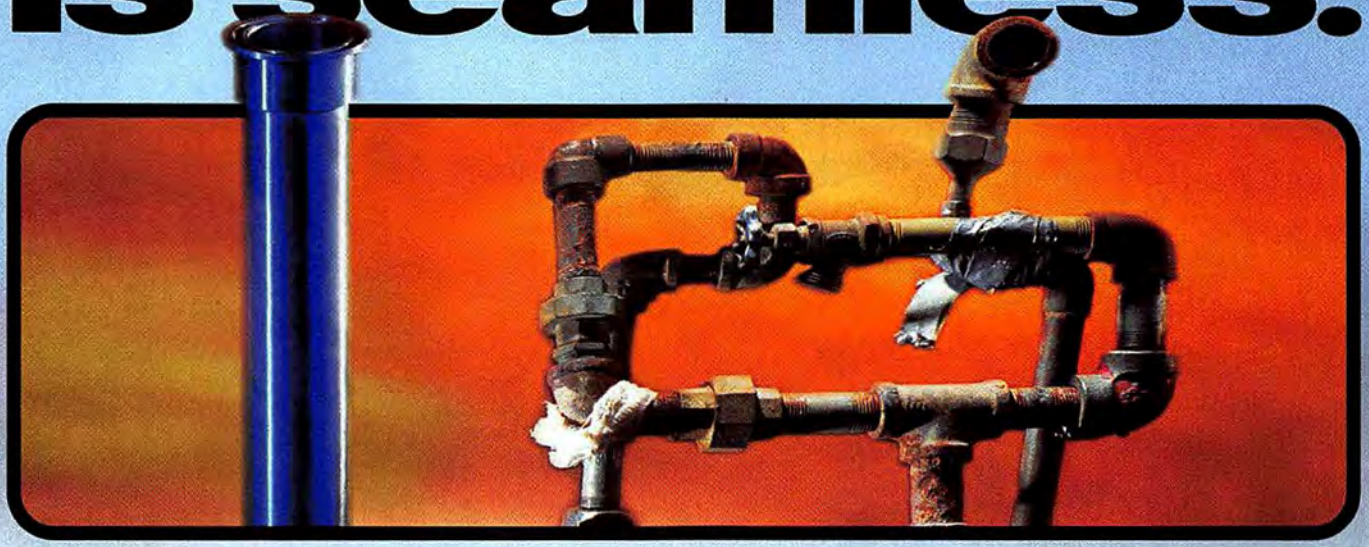

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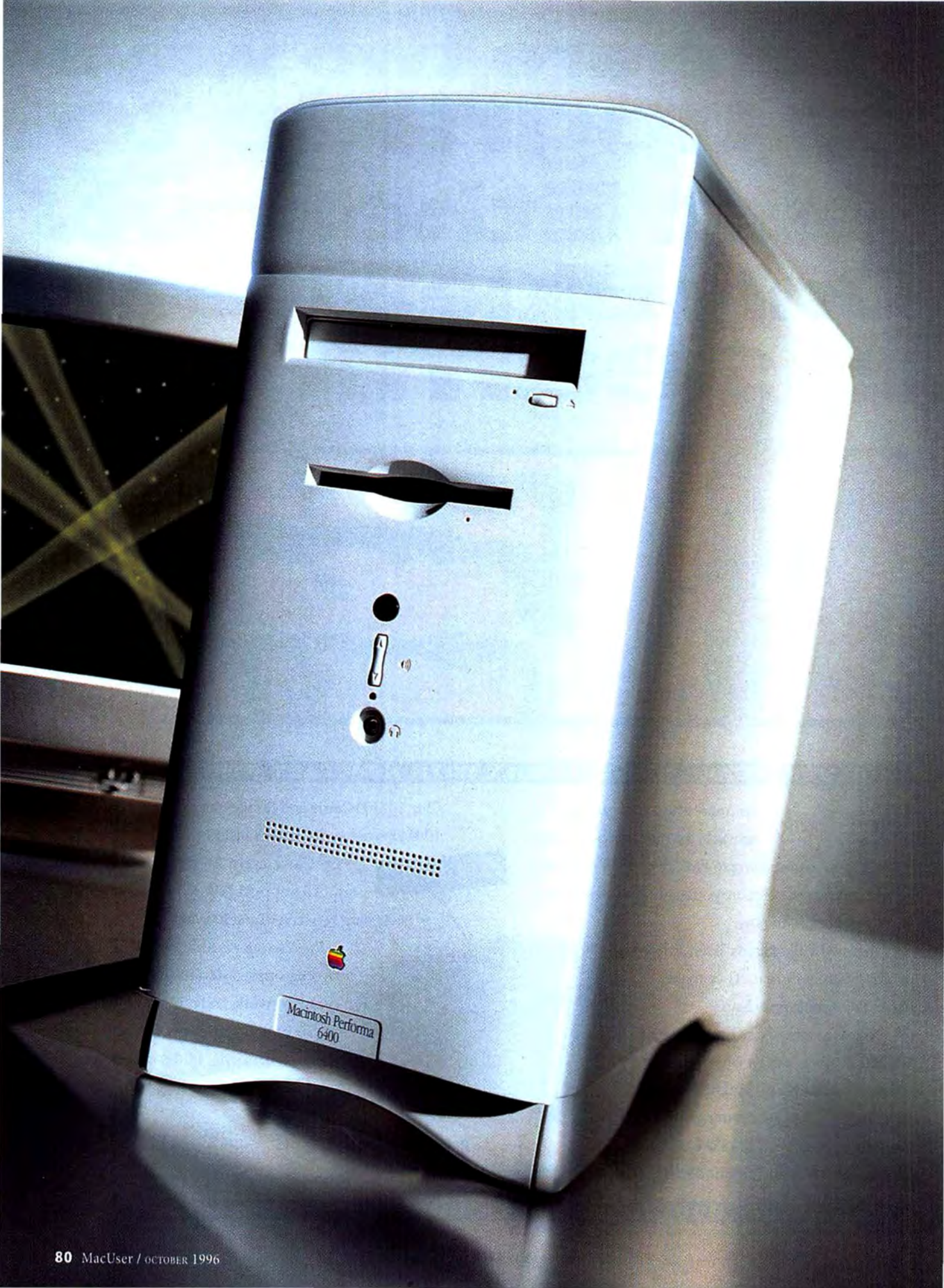

Macintosh Performa
6400

STAR PERFORMA

IF YOU THOUGHT PERFORMAS WERE LOW-END, THINK AGAIN.

APPLE'S LATEST ENTRY BREAKS MORE THAN THE SPEED LIMIT.

QUICK — WHAT QUALITIES DO YOU ASSOCIATE WITH THE NAME *PERFORMA?* Value? Probably. Convenience? For sure. Multimedia? Yup. Expandability? Um . . . sort of. No-compromise performance? Hardly. Well, time for another look. The new Apple Performa 6400 outperforms all but the very latest Macs and compatibles, thanks to a PowerPC 603e processor running at a blazing 180 or 200 MHz. Add a pair of fast PCI slots to complement traditional Performa video and TV options, and you have a system that boasts more expandability than any other consumer offering from Apple to date. But the 6400 is also the most expensive Performa ever.

BY HENRY NORR

PHOTOGRAPHY / STEVEN UNDERWOOD

Prices for the new models start at around $2,400 or $2,800, depending on configuration. And that's without a monitor. A fully decked-out system, complete with the optional TV tuner and video-capture card, Apple's slick new video-editing add-on (see the "Avid Cinema" sidebar), and a high-quality monitor could easily cost you more than $4,000. Granted, like all other Performas, the 6400 comes with a slew of bundled software — 20 titles in all, including Adobe PhotoDeluxe, ClarisWorks, and Quicken. But for a consumer model, it's pricey, especially when you compare it with similar offerings from Power Computing (see the Reviews Special Report, in this issue).

TOWER OF POWER

If you're familiar with previous Performas, you'll notice one difference in the new machine immediately. The 6400 is the first Performa in a tower case. For years, Apple's most powerful business Macs have come in this form factor, as have a variety of Wintel PCs. But for Performa purposes, Apple has stuck with all-in-one enclosures (such as the Performa 5215) or traditional modular desktop designs (the new Performa 6320, for example). This year, however, the company is bowing to research that shows that customers associate the tower design with power and expandability.

As towers go, this one is pretty conventional on the outside. Although some competitors in the consumer market are moving to designer color schemes (check out the new "PC by Sony," which comes in charcoal and violet), Apple opted to stick with the same bland beige it uses for other desktop systems. And the new machine's dimensions are virtually identical to those of the Power Mac 9500, with the exception of the 6400's softly rounded edges. These are supposed to give it a more homey look, although the computer reminded us of either a laundry hamper or a slightly oversized bread-baking machine.

Early press accounts about the 6400 described a more innovative enclosure. But, Apple officials told us, focus groups showed that consumers preferred more-conservative designs, so in a determined effort to be customer-driven, the company shifted gears. To turn the heads of holiday shoppers, Apple is instead counting on a slick self-running demo that shows off the system's multimedia capabilities.

APPLE PERFORMA 6400/200 ★★★½

PROS: Fast and powerful. Easy expandability. Excellent sound system. Avid Cinema option.

CONS: Pricey. Lackluster display resolution and color support. Less than stellar design.

EASY EXPANSION

The design Apple has used for tower Macs, from the Quadra 900 to the current Power Mac 8500 and 9500 models, is infamous among users and technicians for making a harrowing ordeal of what should be simple expansion tasks, particularly adding memory. Fortunately, the company was smart enough not to peddle such a system in the consumer arena. Adding memory, cards, or drives to the 6400 is a snap: As with other recent Performas, the logic board slides right out of the machine. All you have to do to get access to it is remove two screws on the back and pull.

The board itself, code-named Alchemy, uses the same design as that of the Power Mac 5400/120, Apple's latest education offering (see "Mini Macs Grow Up," August '96, page 76). Like the 5400, the 6400 has 8 MB of memory soldered on the board plus two DIMM slots that can hold as much as 128 MB of additional RAM, for a total of 136 MB. Both configurations of the 6400 — a 200-MHz model with a 256K L2 cache and a 180-MHz model with an optional cache — ship with a second 8 MB in one of the DIMM slots. That's a total of 16 MB of RAM out of the box. And you can add another DIMM without having to match or remove the one Apple ships (ask for a 168-pin DIMM running at 70 nanoseconds or faster).

If you choose the 6400/180 and then decide you want to equip it with a cache, you can buy an Apple High Performance Module cache card for about $100. Cache cards designed for other Mac models won't work with the 6400. However, several third-party vendors are expected to offer 6400-compatible cards, although none were available yet at press time.

Also on the 6400 board is Apple's Comm Slot II, filled in the 6400 with a 28.8-kbps modem. If you wish, you can replace it with an Ethernet adapter and use the modem port instead for telecommunications (the standard modem port can't be used when the modem card is installed.)

Still another slot is designed specifically for Apple's digital-video-input card, which you will need if you want to watch TV or edit video on the 6400. Currently, the card is available only as part of the $249 Apple Video System, which also includes a TV tuner that slides into a

ZIPPIEST PERFORMA EVER / the 6400 nips at the heels of Apple's fastest Power Mac

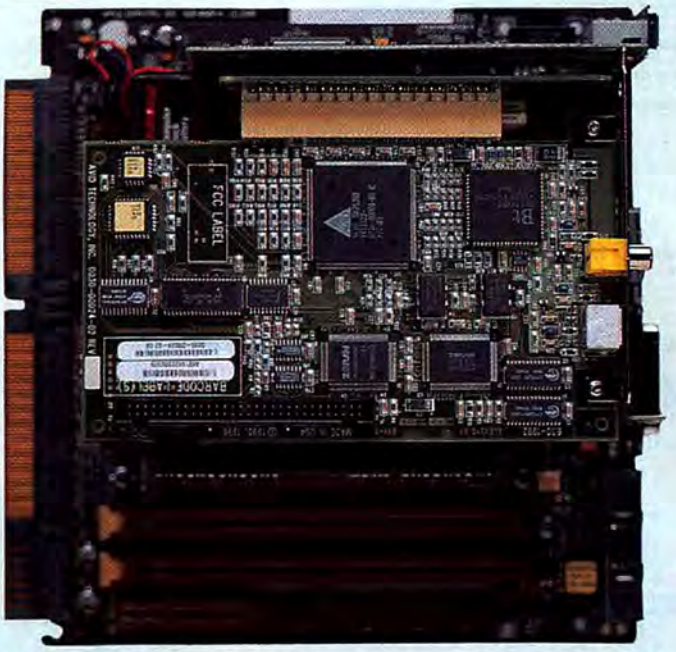
NOTHING TAXES THE PROCESSING POWER of your Mac more than today's video-game software and applications such as video editing and photo enhancement. With these in mind, Apple has built plenty of speed and muscle into the new Performa 6400. In our MacBench 3.0 tests, it handily outperformed Apple's current entry-level business system, the 7200/120, and even breezed by Apple's top-of-the-line Power Mac, the 9500/150, in one of our MacBench tests.

The MacBench Processor test measures overall CPU and memory-subsystem speed. The Floating Point test measures the speed of specialized mathematical calculations. The Disk Mix and Graphics Mix tests emulate how the 12 best-selling Mac applications exercise the hard-disk and display systems. The Publishing Disk Mix and Publishing Graphics Mix tests emulate Photoshop and QuarkXPress use. All tests were conducted with 16 MB of RAM and System 7.5.3 installed. All MacBench 3.0 scores are relative to those of a Power Mac 6100/60 (with a 250-MB Quantum internal hard drive and with built-in graphics hardware), which is assigned a score of 10.0 in each test.

PERFORMA 6400 / expandability = versatility

AS ITS TOWER DESIGN INDICATES, the Performa 6400 is built for expansion. The logic board slides out the back, so you can easily replace it with a new board when faster chips become available. Two 7-inch PCI slots are provided for add-ins, such as Apple's PC Compatibility Card or the Avid Cinema digital-video card. An expansion bay in the front of the machine can hold an additional SCSI-based storage device, such as a hard drive or removable-media drive.

A slide-out logic board makes for easy upgrading.



Avid's Motion JPEG PCI card, the hardware member of the Avid Cinema option (see the "Avid Cinema" sidebar), plugs into the 6400's logic board to provide complete video-editing capability. The JPEG chip on the card delivers video quality on a par with that of VHS tape.

separate bay at the back of the machine, plus an infrared remote control. In the future, however, Apple may offer the video-in card separately, probably at around $99, for customers who don't want TV. If you buy the Video System or pick up the video-in card separately, be sure that it's labeled "compatible with the Performa 6400" — older units will fit, but new ones have an improved, 60-pin DAV (digital audio video) slot.

The 6400's crowning glory, in terms of expandability, is a riser connector with slots for two PCI cards. Popular options are sure to include Apple's Cyrix 5x86-equipped PC Compatibility Card, as well as the new Avid Cinema card, which supports professional-quality MJPEG video (see the "Avid Cinema" sidebar). However, you can add almost any network, display, or multimedia card designed for PCI-based Power Macs. There's just one caveat: The 6400's compact logic board leaves room only for 7-inch PCI cards, not the full 12-inch size some cards (including Apple's own Pentium card) come in.

For data storage, the 6400 comes with a standard 1.4-MB floppy-disk drive (PC- as well as Mac-compatible), an 8X CD-ROM drive (offering data-transfer rates of 1.2 MB per second, twice that of Apple's fastest previous CD-ROM drives), and an Enhanced IDE hard drive (1.6 GB in the 180-MHz configuration, 2.4 GB in the 200-MHz system). If you should ever need to service or replace these drives, you can simply pop a plastic panel off the front of the system. In case you want to install another drive, there's an empty 5.25-inch bay at the top of the tower that's big enough for any standard internal device. Power and data connectors are preinstalled, so all you have to do is plug in the drive.

As external peripherals, the 6400 offers the usual Mac options: SCSI and ADB (Apple Desktop Bus) connectors plus printer and modem serial ports. Both serial ports are now based on Apple's GeoPort technology, so you won't run into the performance problems owners of earlier Performas sometimes encountered.

BOOKMARK

RELATED INTERNET SITES

Apple Desktop Computer Systems
A complete description of all of Apple's current systems.

GO TO http://www.zdnet.com/macuser/1096.html#performa

CONFIGURATION				MACBENCH 3.0 SCORES											
	Installed L2 Cache	Processor	Hard-Drive Capacity	Processor		Floating Point		Disk Mix		Publishing Disk Mix		Graphics Mix		Publishing Graphics Mix	
Performa 6400/200	256K	603e	2.4 GB	27.5		31.2		24.9		16.0		18.9		14.6	
Performa 6400/180	none	603e	1.6 GB	19.3		24.5		19.5		14.3		13.6		11.4	
REFERENCE SYSTEMS															
Power Mac 7200/120	256K	601	1 GB	19.2		20.7		16.6		15.9		23.9		25.5	
Power Mac 9500/150	512K	604	2 GB	31.9		29.7		30.9		17.5		47.2		36.2	
				SCORE	BETTER	SCORE	BETTER	SCORE	BETTER	SCORE	BETTER	SCORE	BETTER	SCORE	BETTER

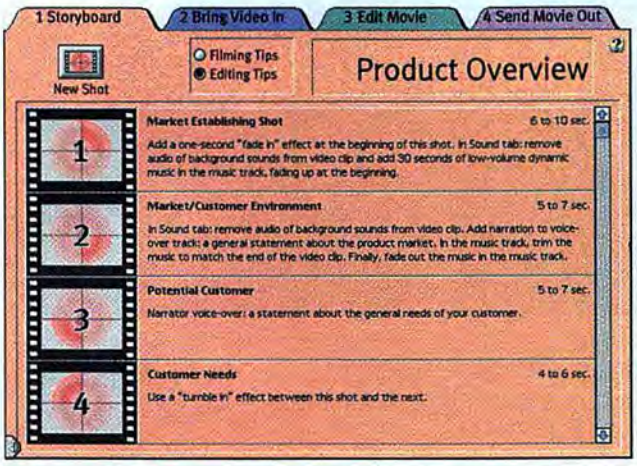
BEST PERFORMER IN EACH TEST

AVID CINEMA / easy as 1-2-3-4

VIDEO EDITING FOR THE REST OF US — that's the promise of Apple's new Avid Cinema. And judging by our experience with a prerelease version, the Cinema system is well on its way to meeting that objective.

The $459 package is the fruit of a joint effort between Apple and Avid Technology, a longtime developer of high-end Mac-based video-production systems. The Cinema system combines a PCI card that processes digitized video with video-editing software designed specifically for novices and nonprofessionals. The system makes it easy (yes, truly easy) to plan a home video; bring in clips from a camcorder, VCR, QuickTime movie, or other source; edit the video so you get just the shots you want in the order you want them; add audio, titles, and special effects; and print your finished work to videotape or save it to your hard disk.

Apple announced the product along with the Performa 6400, and the two together make a great team. However, besides getting the Avid Cinema card itself, you'll also need to equip your 6400 with the Apple Video System, a separate video-capture card that sells for about $100 and plugs into a dedicated



STEP 1. STORYBOARD / The Avid Cinema system's StoryBoard helps you plan your video before you shoot it. The software includes 21 customizable templates designed for home, school, and business, on topics ranging from family reunions and school concerts to sales training. Each template includes a list of suggested shots and durations, plus tips on filming and editing them.

STEP 2. BRING VIDEO IN / With the Cinema system, you can import your video clips with a single click. Clips you've planned with the StoryBoard are shown in the list at the right of the screen. As you bring the clips in (with or without audio), they're displayed on-screen. Each clip is represented by a block along the timeline at the bottom of the screen. A convenient hard-drive gauge tells you how much video can be captured.

Finally, there's sound, and lots of it. A headphone jack and volume control are conveniently located on the front of the machine; microphone and speaker connectors are in the back. The sound system is simply the best that Apple has ever delivered in any model — full 16-bit, 44-kHz stereo input and output with SRS 3D Surround Sound Enhancement. The internal speaker is more than adequate for many purposes (watch out — if you set the volume to its maximum level, the startup chime alone may wake your neighbors). If you plug in external speakers, the internal speaker will function as a subwoofer, for improved bass response.

BUILT FOR SPEED

If you've tried older Performas and PowerBooks with 603 and even 603e processors, you probably think of these low-cost, low-power members of the PowerPC line as something less than barn burners. The 6400 should change your mind.

Several things differentiate this system from most earlier 603-based models. One, obviously, is the processor's clock speed: at 180 and 200 MHz, the 603e chips used in the 6400 are dramatically faster than last year's first-generation 603 and 603e, which ran at 75 and 100 MHz, respectively, or even the 120-MHz 603e used in the Power Mac 5400. Second, the 6400 is free of many of the design compromises that hamstrung earlier models. For example, although the Alchemy logic board doesn't support memory interleaving, a speed-enhancing feature of high-end Power Macs, its 40-MHz system bus can transfer 64 bits of data at a time. Apple's previous 603 and 603e systems, with the exception of the 5400, had only 32-bit buses. Likewise, the Extended IDE drives in our test systems are far faster than those used in previous Performas. Although Apple reserves the right to change drive manufacturers and models later, the company says it plans to qualify only very fast drives for the new tower.

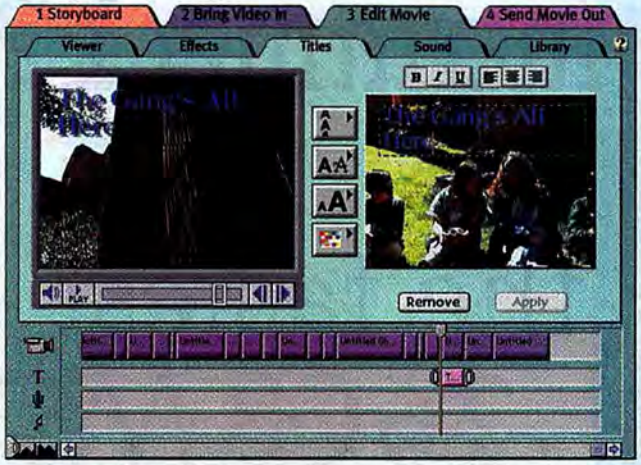
The combined effect of all these factors? The 6400/200 outperforms Apple's current entry-level business system, the PowerPC 601-based Power Mac 7200/120, by upwards of 40 percent on MacBench 3.0's Processor, Floating Point, and Disk Mix tests. It even beats out the 604-based 9500/150, currently the top of Apple's business line, on the Floating Point test. The 9500/150 has an appreciable advantage in processor speed, but the 6400 does edge out last year's champ, the 9500/132.

The stock 6400/180 doesn't do nearly as well: It just about matches the speed of Apple's 7200/120 on the Processor test and beats it handily on the Floating Point test but lags behind on all the other tests except the Disk Mix test. Apple's higher-end systems leave it in the dust.

Although the difference in speed between the 180- and 200-MHz versions of the 6400 may seem surprisingly large, considering that the differential in clock speed is only 11 percent, the key factor is the

slot on the 6400's logic board. But even if you're not in the market for a new Performa right now, you might not be out of luck: The Avid Cinema also runs on the Power Mac 5400 (again, with the addition of the Apple Video System) and on the Power Mac 7500, 7600, and 8500, which come with the required built-in video-in circuitry. Whatever model you have, you'll also need System 7.5.3 or later and at least 16 MB of RAM and a 1-GB hard drive.

The Avid Cinema captures 30 frames per second, using MJPEG (Motion JPEG) compression to produce video whose quality is comparable to that of VHS tape. It stores the images in QuickTime format at a resolution of 320 x 240 pixels, but it can expand resolution to 640 x 480 pixels via interpolation and filtering. The software won't let you create every video effect you've ever seen on TV — it handles only one video track, for example, so you can't overlay images from two sources (although you can mix two audio tracks). But for creating home videos, as well as sales and training tapes for small businesses, the Avid Cinema system provides all the features you need, at an amazingly low price.



STEP 3. EDIT MOVIE / The real Cinema magic comes into play as you edit your movie. You can trim and reorganize clips, using familiar cut, copy, and paste operations. Next, you add titles or scrolling credits in your choice of font, style, and color. Finally, you add your transitions (you can choose from more than 25, including fades, dissolves, and wipes) and overlay narration or music.

STEP 4. SEND MOVIE OUT / Once your masterpiece is complete, it's time to preview and publish it. You can send it out to videotape (through the card's Composite or S-video outputs), leave it in Avid Cinema's own format (so another user can edit it later), or save it as a QuickTime movie. Once your movie is in QuickTime format, you can distribute it on the Internet or use it with presentation programs such as PowerPoint.

cache. Because the lower-priced version lacks an L2 cache, it can't take full advantage of the RISC processor. Installing Apple's 256K High Performance Module in the 180-MHz system brought its scores to only a hair behind those of its 200-MHz sibling.

In fact, if you're choosing between the two 6400 configurations, there's a case to be made for picking the 180-MHz version, priced at about $2,400, and adding the L2 cache, at a cost of about $100. You'll get a hard drive with slightly lower capacity, but the computer has nearly as much performance, and you'll save a couple of hundred dollars off the price of the 200-MHz model, which costs about $2,800.

THE CATCH

In addition to price, the other area in which the 6400 falls short is graphics. The first issue is speed: As revealed in their MacBench Graphics Mix and Publishing Graphics Mix scores, neither 6400 configuration can keep up with any recent Power Mac. The second issue is resolution and color depth. The built-in graphics subsystem supports 16-bit color ("thousands of colors") at resolutions up to 800 x 600 pixels but only 8-bit color (256 colors) at higher resolutions, up to a maximum of 1,024 x 768 pixels.

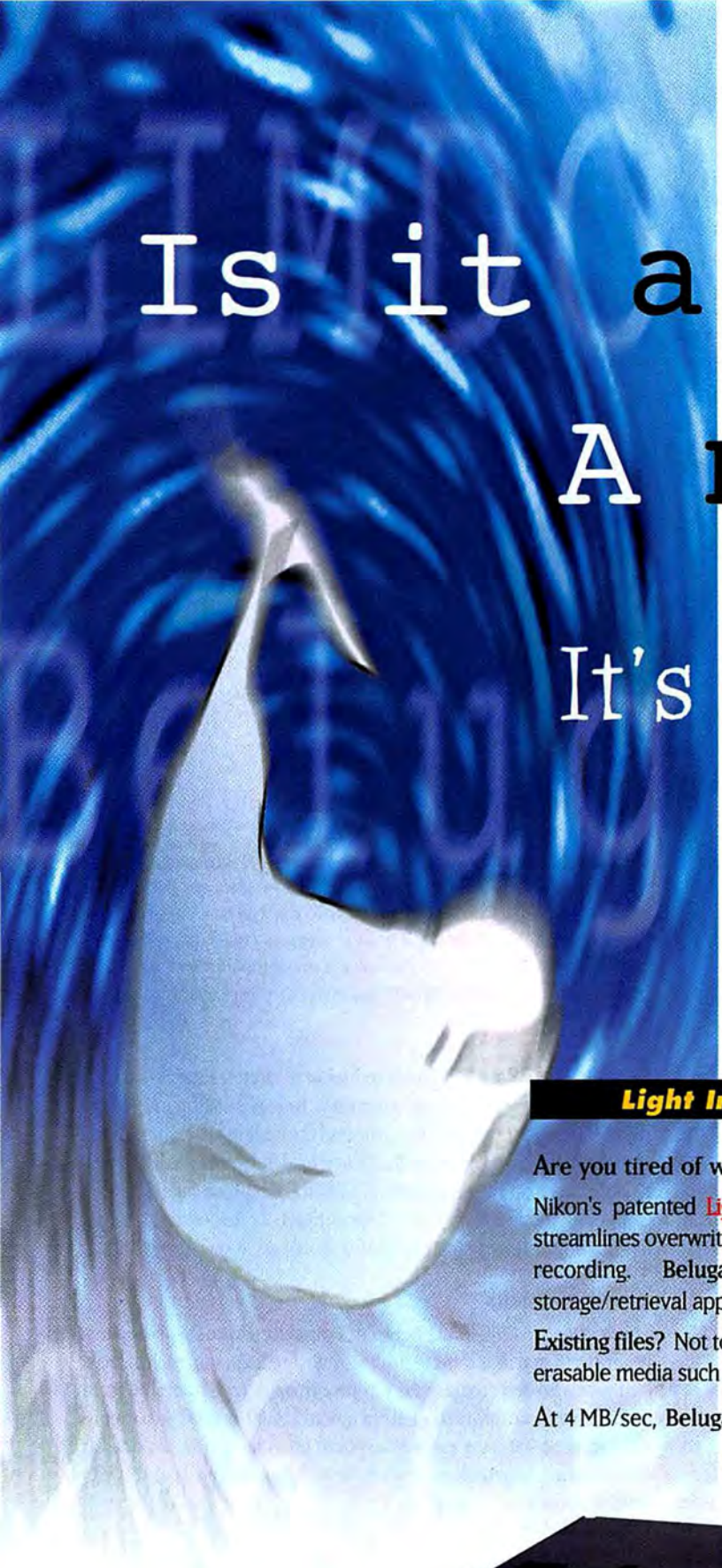
That may be acceptable as a base-level configuration, but short of adding a relatively expensive PCI graphics card, there's no way to upgrade the system to support true color on a screen of any size or "thousands of colors" at 17-inch or higher resolutions. Apple said it is marketing the 6400 without a monitor to leave customers free to choose. That's commendable — too bad the system's designers didn't give users a similar level of flexibility in determining what they'd be able to see on the screen of their choice. Graphics capabilities in competing models from Power Computing (see the Reviews Special Report, in this issue) stand head and shoulders above the 6400's.

HOME IMPROVEMENT

The Performa 6400's limited graphics capabilities are surprising in a product pitched as a top-of-the-line multimedia platform. However, for those who don't require the ultimate in on-screen color and resolution or who can afford to shell out an extra $300 or $400 for a graphics card, the 6400 is a great home system for video-game aficionados and amateur moviemakers. It won't come cheap, but you'll get an awful lot of Mac for your money.

Henry Norr is editor emeritus at *MacWEEK* and a frequent contributor to *MacUser*. *MacUser* Senior Project Leader Jeffy Milstead managed the testing for this report.

MacBench 3.0, the benchmark software used for testing in this report, is available online on ZD Net from Ziff-Davis Benchmark Operation at http://www.zdnet.com/zdbop/.



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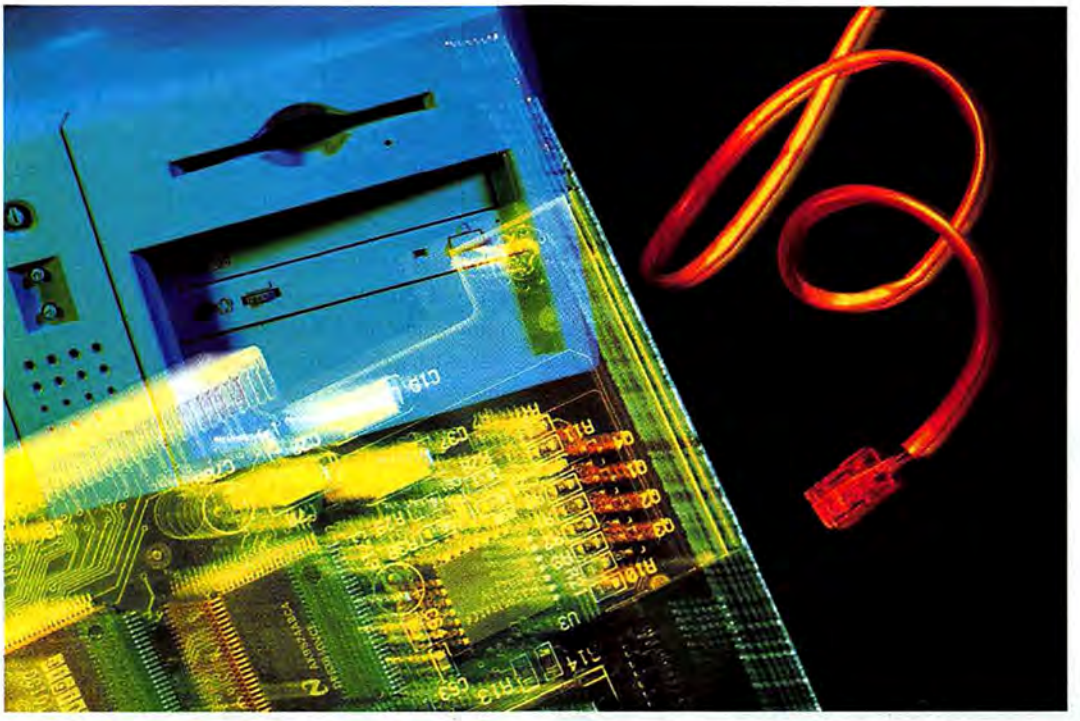


ETHERNET

IS FAST ETHERNET THE ANSWER TO YOUR NETWORK TRAFFIC WOES? MACUSER LABS TESTS THE LATEST FAST ETHERNET CARDS AND ANALYZES THE SPEED THEY OFFER WITH OPEN TRANSPORT, CLASSIC NETWORKING, AND PC-BASED NETWORKING.

REMEMBER WHEN LOCALTALK WAS FAST? It was a time when files were just tens of kilobytes each — small enough to transfer quickly over a LocalTalk network. But that didn't last long.

Eventually, your files grew to 1, 2, and 3 MB. Suddenly, LocalTalk wasn't fast enough. It was time to dump those LocalTalk connectors and the daisy chain and invest in the speed promised by 10BASE-T Ethernet cards and hubs. Installing 10BASE-T equipment meant a major overhaul — you rewired the office, bought new hardware and software, and took time to install everything. You paid a fortune, but your speedy 10-megabit-per-second Ethernet network was copying those large files, churning out print jobs, and delivering e-mail faster.

BY SHELLY BRISBIN

PHOTOGRAPHY / LON CLARK

Now history is repeating itself. Your files are 10, 20, and 30 MB. 10BASE-T isn't fast enough anymore. Maybe it's time to upgrade your Ethernet network to the new promised land: 100BASE-T, known as Fast Ethernet. Fast Ethernet offers a wider bandwidth than 10BASE-T, so more data can move across a network. The result is faster file transfers — well, that's the theory at least.

Despite the promise of triple-digit network speeds, Fast Ethernet's potential is not fully realized, especially on the Mac. Slow I/O devices along with AppleTalk, the Finder, and other components of the Mac OS conspire to limit general networking speed. File-transfer speeds on the Mac do not approach those of similarly equipped and connected PCs.

Demonstrated differences between Mac and PC network speed, as well as the financial and logistical issues associated with network upgrades, led us to two central questions: How fast *is* Fast Ethernet? And what kind of speed improvements can Mac users expect from it? To answer these burning questions, MacUser Labs gathered ten NuBus and PCI Fast Ethernet cards from six vendors and set about the task of finding which of the bunch delivered the fastest speed. We ran each card through a suite of tests designed to represent several real-world tasks in a network environment. To analyze our results, we compared each card's speed to that of the standard Ethernet built into the Mac as well as to Fast Ethernet on a PC. Our network lab experts found that you'll get solid speed gains if you switch from 10BASE-T to Fast Ethernet; however, several other factors affect the size of the speed boost you can expect.

THE BOTTOM LINE

100BASE-T, OR FAST ETHERNET, provides improved speed over 10BASE-T but is far from reaching its full potential. The Mac OS, Open Transport, and other Mac-related constraints prevent Fast Ethernet from really taking off. We suggest that you carefully consider the needs of your network environment and use Fast Ethernet only in areas where traffic is heaviest.

+ / OUTSTANDING ● / ACCEPTABLE − / POOR

RATING	PRODUCT	PRICE	SPEED	FEATURES	SUPPORT
PCI CARDS					
$$$$	**Asanté AsantéFAST 10/100** BEST BUY	+	+	+	+
	The AsantéFAST 10/100 PCI card offers an excellent combination of price ($239 list, $199 estimated street) and speed. This version of the card will come bundled with Asanté's NetDoubler, a software accelerator that should make its speed even faster.				
$$$½	Digital Fast EtherWORKS 10/100	+	+	●	+
$$$	Farallon Fast EtherTX-10/100	+	−	●	−
$$$	RNS 2300-TX Fast Ethernet	●	+	●	−
$$$	Sonic EtherFE 10/100	−	+	●	●
$$½	Dayna DaynaPORT BlueStreak 10/100	−	−	●	●
NUBUS CARDS					
$$$$½	**Asanté AsantéFAST 10/100** BEST BUY	●	+	+	+
	For the best speed from the AsantéFAST 10/100 NuBus card ($399 list, $319 estimated street), use it with classic networking. It can then outrun other Fast Ethernet cards on a PCI Mac.				
$$$½	Dayna DaynaPORT BlueStreak 10/100	−	●	●	●
$$$½	Sonic EtherFE 10/100	−	●	●	●
$$$	Farallon Fast EtherTX-10/100	●	−	●	−

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

FAST ETHERNET BASICS

Before you decide to dump all those 10BASE-T cards and spend the cash on Fast Ethernet equipment, you need to analyze the cost-benefit for your situation. Is the traffic on your network so heavy it prevents you from printing, moving files, or accessing shared data efficiently? Does your art department grind to a halt as 30-MB files move among workstations? Do you often take a coffee break while waiting to print a PowerPoint presentation stored on a server? If the answer to these types of questions is yes, you'll want to take the next step — determining how much hardware, wiring, and labor you need to make a full or partial transition to Fast Ethernet. You'll also want to refer to our test results, not only to choose the fastest Fast Ethernet card but also to add to your understanding of the role hardware, software, and protocols play in network speed.

Because you'll probably be on familiar ground with Ethernet hardware, you'll find the physical transition pretty easy. Fast Ethernet looks and acts a lot like the 10BASE-T network you may have installed already. The *topology* (the physical layout of the network), the network hardware connectors, and — if you're lucky — the wiring you'll need to connect your Macs and other network devices for Fast Ethernet are the same as for 10BASE-T. A Fast Ethernet network uses an *active star* setup — one or more hubs with connections to each networked device. Those devices each include a *NIC* (network interface card), which connects to the hub via *UTP* (unshielded twisted pair) wiring and RJ-45 jacks. 10BASE-T and Fast Ethernet use two-pair UTP wiring: 100BASE-T requires Category 5 wire, which has heavy copper and more twists in the cable, for connection integrity. Since Fast Ethernet has a wider bandwidth, more data travels through the wire. The integrity of Category 5 wire becomes important. 10BASE-T can use either Category 5 or Category 3 wire, which has less copper and fewer twists than Category 5. If your office has been rewired within the past couple of years, you may already have Category 5 wiring installed; otherwise, you'll need to upgrade.

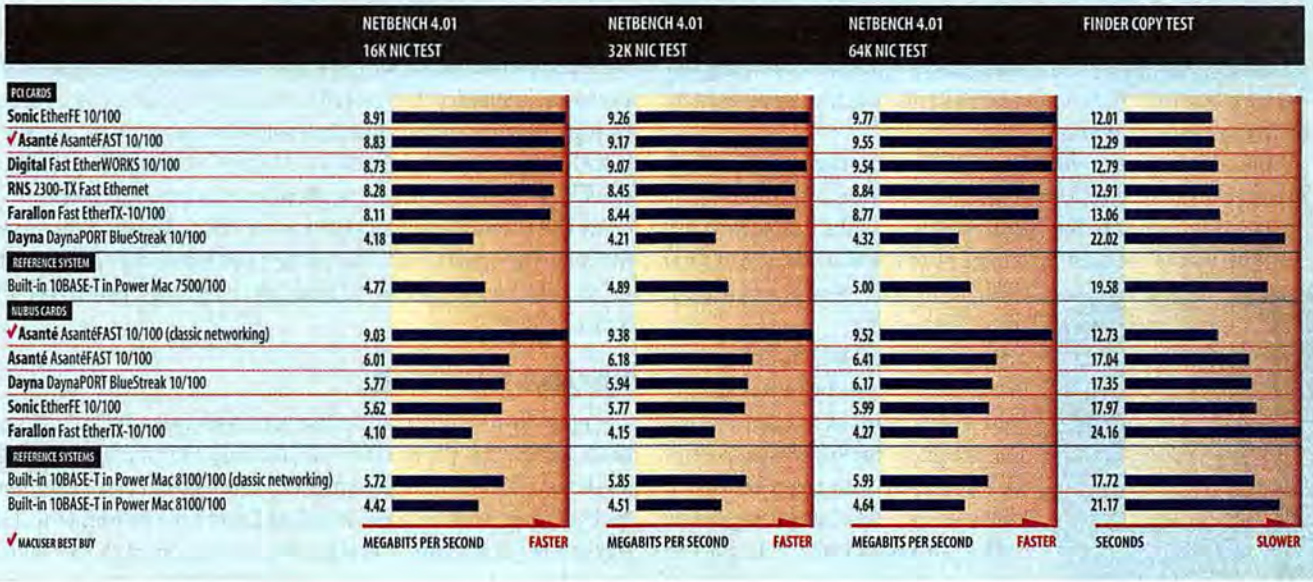
Several vendors sell cards and hubs for both UTP Ethernet standards. Card vendors are particularly obliging, selling autosensing 10/100BASE-T cards that work with either 10BASE-T or Fast Ethernet. This means that you can buy and use a Fast Ethernet card at 10 Mbps today, even before you've wired the network, purchased new hubs, or figured out which part of your network should be the first to move to Fast Ethernet. When you finally change your hubs and/or wiring to accommodate the Fast Ethernet cards, the cards will automatically switch from 10- to 100-Mbps file transfers.

The transition is simpler when it comes to application software. Applications that communicate via standard protocols — AppleTalk, TCP/IP, and MacIPX — don't care what kind of network hardware lies underneath. The only adjustment you'll need to make once you've installed the driver that comes with each Fast Ethernet card is in the Mac OS' networking control panel, where you select what port you want to use for your network connection.

IN THE NIC OF TIME / how fast *is* Fast Ethernet?

WE USED A SERIES OF TESTS to determine the speed provided by each Fast Ethernet card in various situations. We ran a suite from NetBench 4.01 NIC tests, which perform reads and writes in 1K, 2K, 4K, 8K, 16K, 32K, and 64K segments. We performed each test twice and averaged the results. We found that the speeds of all the cards in our NetBench tests were consistent and proportional, so we charted only those involving the larger file sizes. NetBench provides results calculated in average Mbps. Our test setup included only one client and the server.

In addition to the NetBench NIC tests, we performed a Finder copy of a 10-MB Adobe Photoshop file from the server to the client. Our server was a Compaq ProLiant running Novell NetWare 4.1. The Compaq machine had 64 MB of RAM, a Compaq Netflex 3 Fast Ethernet card, and an IntelExpress 100BASE-TX stackable hub. Our Mac clients were an Apple Power Mac 7500/100 and 8100/100, each with 16 MB of RAM and running System 7.5.3. All tests used Open Transport 1.1 as the network driver, except where noted. For reference, we tested each Mac client's built-in 10BASE-T, using an Asanté 10T hub.



LIFE IN THE FAST ETHERNET LANE

To compare the speed of Fast Ethernet cards, we used a combination of file-transfer and benchmark tests representing real-world situations and environments. As our server in all the tests, we used a Compaq ProLiant PC with 64 MB of RAM, running Novell NetWare 4.1. The server had a Compaq Netflex 3 Fast Ethernet card and an IntelExpress 100BASE-TX stackable hub. We installed each PCI card in an Apple Power Mac 7500/100 and each NuBus card in an Apple Power Mac 8100/100.

Using Ziff-Davis Publishing Operations' NetBench 4.01 benchmarking software, we ran a suite of sequential read tests, which transfer data from server to client. We ran the entire NetBench NIC Suite, which performs several read tests that transfer data in 1K, 2K, 4K, 8K, 16K, 32K, and 64K chunks. The tests produce results in Mbps, making them particularly useful for comparing rated speed (100 Mbps for all the Fast Ethernet cards) with actual throughput.

Across the board, we found that Fast Ethernet is, well, faster than 10BASE-T. But the increase in speed averaged only 29 percent in each NetBench test — transfers were not 10 times as fast, as the spec implies. 10BASE-T speed (based on the built-in 10BASE-T hardware in our Mac clients) ranged from 1.74 Mbps (NuBus-based Ethernet with Open Transport in the 1K NIC read test) to 5.93 Mbps (NuBus-based Ethernet with classic networking in the 64K NIC test). Fast Ethernet speed topped out at 9.77 Mbps (the Sonic EtherFE 10/100 PCI card with Open Transport in the 64K NIC test).

Because networks can handle large chunks of data more efficiently than small ones, we were not surprised to see that throughput for both 10BASE-T and Fast Ethernet improved when we increased the file size. These results confirm the general rule of thumb that networks are fastest when they're moving large chunks of data. This being the case, upgrading to Fast Ethernet would provide the best results in a workgroup environment, where moving large files is commonplace. E-mail, which usually traverses the network in tiny chunks, doesn't get much faster on a high-speed network.

If a peak speed of 9.77 Mbps with a Fast Ethernet card that offers a potential throughput of 100 Mbps sounds unimpressive, read on. Although Mac users can claim general equality (or even superiority) with PC users in the war over CPU speed, networking remains a source of frustration. To get an idea of the true handicap networked Mac users face when compared to PC users, we changed our Power Mac 7500/100 client for a Compaq XL5000 with a 100-MHz Pentium processor. We then ran our NetBench 4.01 suite with the AsantéFAST 10/100 Adapter for PCI (one of the fastest PCI cards we tested) installed in the PC. The Compaq machine achieved a speed of about 20 Mbps in the 1K NIC test and over 40 Mbps in the 64K NIC test. The Power Mac 7500/100 with the same Asanté card installed did not even reach 10 Mbps in the 64K NIC test.

Clearly, the Mac OS itself is the biggest factor affecting network speed for all Macs. Although many components of the Mac OS are now PowerPC- and/or Open Transport-native, many more are not. The interplay of AppleTalk, the Finder, Apple's networking software, and the Mac OS' overall architecture tends to slow network throughput relative to that of other computer systems. AppleTalk, for example, uses much smaller *packets* — the units of data that travel across a

network — than does TCP/IP. At the beginning and the end of a data transfer, each AppleTalk packet confirms its status to both of the machines involved, generating extra network overhead that slows everything down. Another major component of the Mac OS that affects network speed is Apple's new communications architecture, Open Transport.

OPEN TRANSPORT OUT IN THE OPEN

All PCI Macs require Open Transport in order to connect to and communicate over a network. Open Transport is an integrated, modular framework of software and support for Mac hardware and software standards. Released last year and revamped earlier this year to fix significant bugs, Open Transport replaces separate networking services, such as AppleTalk and TCP/IP (Apple calls the use of separate services *classic networking*).

NuBus Macs can use either Open Transport or classic networking. To compare the speed of Open Transport and classic networking, we compared the speed of the fastest NuBus card, the AsantéFAST 10/100, with that of the built-in 10BASE-T of our Power Mac 8100/100 client, using both Open Transport and classic networking.

BOOKMARK

RELATED INTERNET SITES

Apple's Open Transport Web Site
Technical information, developer support, and links to Open Transport-native shareware.

GO TO http://dev.info.apple.com/evangelism/opentransport/

Open Transport was disappointing. In our 64K NIC test, the NuBus Asanté-FAST 10/100 with classic networking almost equaled the 9.55-Mbps speed of the PCI version with Open Transport. When we tested the very same Asanté NuBus card with Open Transport, it clocked 6.41 Mbps. Another surprise in our 64K NIC test: The 5.93-Mbps speed of the Power Mac 8100/100's built-in Ethernet with classic networking beat one of the four NuBus Fast Ethernet cards with Open Transport and nearly matched another.

To put Open Transport through a real-world test, we took out our stopwatch and performed a Finder copy. We copied a 10-MB Photoshop file from the server to a client, to simulate a common networking task. Once again, classic networking beat Open Transport. The NuBus Asanté card took 12.73 seconds for the Finder Copy test, triumphing over all the NuBus competitors and finishing third overall. Sonic's EtherFE 10/100 PCI card was the overall top performer in all our tests, including the Finder Copy.

With classic networking making such an impressive showing in our tests of NuBus cards, why would you *ever* want to use Open Transport on a NuBus Mac? If you need to use TCP/IP, you'll get faster speed by using Open Transport than you would by using classic networking. Also, some applications, such as Asanté NetDoubler (see the "Network Pick-Me-Ups" sidebar), work only with Open Transport.

Yet Open Transport's sluggishness on NuBus Macs isn't necessarily Open Transport's fault. Part of the fault lies in the NuBus cards' driver software — none of the cards we tested had Open Transport-native drivers.

THE CARDS YOU'RE DEALT

The most obvious difference between the two types of Fast Ethernet cards we tested is the bus they use to connect to your Mac. The PCI bus is faster than NuBus; therefore, PCI cards should move data more quickly than NuBus cards in a Fast Ethernet environment. The DaynaPORT BlueStreak PCI card, however, stuck out like a sore thumb in our Finder Copy test, trailing even the NuBus-card pack. All the

FEATURES OF FAST ETHERNET CARDS

	PCI CARDS			
	✓ ASANTÉ AsantéFAST 10/100	DAYNA DaynaPORT BlueStreak 10/100	DIGITAL Fast EtherWORKS 10/100	FARALLON Fast EtherTX-10/100
List price	$239	NA	$169	$249
Estimated street price	$199	$259	NA	$199
Open Transport-native driver	●	●*	●	●
Autosensing	●	●	●	●
PC-compatible card available	●			●
Trade-up from 10BASE-T to 100BASE-T				
Fast Ethernet hubs available	●	●	●	●
Standard on-site service				
Money-back guarantee	●		●	
Toll-free tech support	●	●	●	
Length of warranty	lifetime	lifetime	lifetime	lifetime
Company	Asanté Technologies San Jose, CA 800-662-9686 408-435-8388 408-432-7511 (fax) http://www.asante.com/	Dayna Communications Salt Lake City, UT 800-531-0600 801-269-7200 801-269-7363 (fax) http://www.dayna.com/	Digital Equipment Littleton, MA 800-457-8211 508-692-2562 508-392-0603 (fax) http://www.networks.digital.com/	Farallon Communications Alameda, CA 510-814-5000 510-814-5023 (fax) http://www.farallon.com/

✓ MacUser BEST BUY *Open Transport-native driver was due to be released after our testing. †After 3 years, an extended warranty is available for $100 per year.

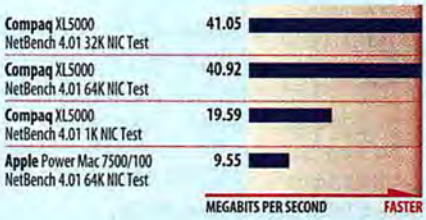
THE PC PERSPECTIVE / on a Mac, 100BASE-T is fast — but not as fast as on a PC

ALTHOUGH THE MAC has several advantages over the PC, it isn't winning the Fast Ethernet race, at least for now. The Mac OS, AppleTalk, and several other factors affect the speed of Fast Ethernet cards on the Mac.

In order to see how the Mac fares against the PC in a Fast Ethernet contest, we tested the speed of an AsantéFAST 10/100 PCI card in an Apple Power Mac 7500/100 and in a Compaq XL5000 with a 100-MHz Pentium processor. Each machine had 16 MB of RAM and a 1-GB internal hard drive. We ran a suite of tests from NetBench 4.01.

As our results show, the Compaq machine recorded a speed of 19.59 Mbps in the 1K NIC test. Every time we doubled the file size when we tested the Compaq machine, the speed increased by about 5 Mbps. When we hit the 32K NIC test, the speed leveled off at 41 Mbps. On the other hand, the fastest speed the Power Mac 7500/100 was capable of was only 9.55 Mbps, in the 64K NIC test.

Several factors probably account for the comparatively sluggish speed on a Macintosh. The PC platforms are using IPX, which is a faster protocol than AppleTalk. In addition, the Macintosh OS still uses emulated code for many of its components. And yes, even our benchmarking software, NetBench 4.01, may have affected speed, because it isn't PowerPC-native.



other PCI cards beat the times of their NuBus counterparts by healthy margins. Dayna's PCI card also had trouble with our NetBench suite, lagging behind all the other cards as well as behind the built-in Ethernet in both the PCI Power Mac 7500/100 and the NuBus Power Mac 8100/100. The Dayna PCI card's slow speed may have been caused by the driver; a new driver was due to be released after we finished our testing.

The PCI cards averaged a speed of 6.43 Mbps in our NetBench tests whereas the NuBus cards (also with Open Transport) averaged 4.43 Mbps. Underneath the overall averages are some interesting numbers: The fastest NuBus card with classic networking, the AsantéFAST 10/100, was a full 5 Mbps faster than the slowest NuBus card, the Farallon Fast EtherTX-10/100, in the NetBench 64K NIC test.

If you have a NuBus Mac, your best option is to install an Asanté card and use classic networking. Our tests indicate that, using classic networking, the Asanté card may give you a speed increase of up to about 3.6 Mbps over built-in Ethernet. If you use Open Transport, the same card provides a speed boost of about 1.8 Mbps over built-in Ethernet.

PCI Macs can get almost double the speed of built-in Ethernet — if you install the right Fast Ethernet card. The Asanté, Digital, and Sonic cards all clocked well over 9 Mbps in our 64K NIC test, beating the 5 Mbps of our Power Mac 7500/100's built-in 10BASE-T.

BACKSEAT DRIVERS

Because all NIC hardware is quite similar, we anticipated that our charts would have lots of uniform bars. In fact, we noticed substantial speed differences between the leaders and the rest of the pack.

	NUBUS CARDS				
RNS 2300-TX Fast Ethernet	SONIC EtherFE 10/100	✓ ASANTÉ AsantéFAST 10/100	DAYNA DaynaPORT BlueStreak 10/100	FARALLON Fast EtherTX-10/100	SONIC EtherFE 10/100
$245	$249	$399	NA	$399	$399
$239	NA	$319	$399	$319	NA
●					
●	●	●	●	●	●
●	●				
			●		
	●	●	●	●	●
		●			
●		●	●		
3 years†	lifetime	lifetime	lifetime	lifetime	lifetime
RNS Santa Barbara, CA 800-262-8023 805-562-3138 805-968-6478 (fax) http://www.rns.com/	Sonic Systems Sunnyvale, CA 800-585-0725 408-736-1900 408-736-7228 (fax) http://www.sonicsys.com/	Asanté Technologies San Jose, CA 800-662-9686 408-435-8388 408-432-7511 (fax) http://www.asante.com/	Dayna Communications Salt Lake City, UT 800-531-0600 801-269-7200 801-269-7363 (fax) http://www.dayna.com/	Farallon Communications Alameda, CA 510-814-5000 510-814-5023 (fax) http://www.farallon.com/	Sonic Systems Sunnyvale, CA 800-585-0725 408-736-1900 408-736-7228 (fax) http://www.sonicsys.com/

NETWORK PICK-ME-UPS / more ways to speed up your LAN

IF YOU OPT NOT TO install Fast Ethernet but still need to increase your network's file-transfer speed, you have other options — you can use software accelerators.

Software packages such as RunShare ($399 for two users), from RUN (201-529-4600), specialize in moving large files from one machine to another. That's also the charter of NetDoubler, which is bundled with Asanté's Fast Ethernet cards and is also available as a stand-alone product for $99. (We didn't use NetDoubler in our primary test suite, because it works only on AppleShare networks.) RunShare and NetDoubler must be installed on each machine involved in a file transfer for the system to work.

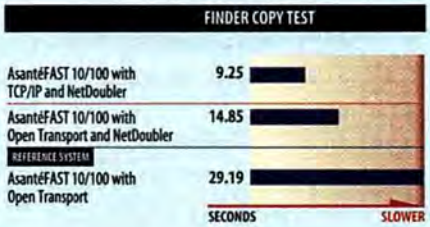
RunShare works its magic by grabbing all the network bandwidth available, whereas NetDoubler substitutes the ADSP (Apple Data Stream Protocol) or TCP/IP for AppleTalk as files are transferred. Each of these protocols can transmit larger packets than AppleTalk can, greatly reducing overhead.

After we tested Asanté's NuBus and PCI cards alone, we installed NetDoubler and an Asanté Fast Ethernet card in an Apple Workgroup Server 9150 and in our Power Mac 7500/100 client. We copied our 10-MB test file from the server, using System 7's file sharing. Using Open Transport, we performed the same test with and without NetDoubler (NetDoubler requires Open Transport). Our NetDoubler copy took about half as long as the unassisted transfer (see the chart). Using TCP/IP and NetDoubler, the copy took slightly less than a third of the time our reference system took. Asanté claims even more-dramatic results when both client and server are PCI Macs, because NuBus network drivers are not Open Transport-native.

RUN also offers RunShare GSA 2 for PCI ($1,799 with a Fast Ethernet card), available for Apple Workgroup Servers. It allows multiple RunShare clients to exchange files with the server at high speed.

If you want to speed up an entire network, try a switched hub, or if your pocketbook is stuffed with large bills, consider using ATM. Switched hubs dedicate one circuit to each network transaction. When two devices communicate, the channel they use is switched, so they don't compete for bandwidth with any other network traffic. Switched networks use the same NICs and wiring as shared LANs do: The difference is that you need switching hubs.

ATM (Asynchronous Transfer Mode) has nothing to do with typography or instant cash. Instead, it's a very fast (up to 155 Mbps) network standard that has gained some popularity with organizations that need to transmit high-bandwidth information (such as live video, high-quality audio, voice, or data) over a network. ATM is also promoted as a *backbone* technology — a standard that connects departments or other groups of users while individuals are using 10BASE-T or Fast Ethernet within their workgroups. A few vendors offer NuBus and PCI ATM cards for $500 to $1,000 each. But you need to have the ATM backbone and switches installed, which can be expensive.



Discussions with vendors and the retesting of several cards revealed an unfortunate tendency toward buggy driver software. Vendors blame Apple, whose Open Transport 1.0 was so buggy it prevented most of them from shipping Fast Ethernet cards as planned last year. Although version 1.1 was enough of an improvement for vendors to ship their cards, Open Transport still gives third-party vendors fits. Apple plans to ship a NIC driver template with Open Transport 1.1.1 (which was released after our testing), to aid vendors in writing compatible software. Given Open Transport's history, vendor complaints seem somewhat justified, but it also seems likely that some vendors are suffering from "1.0 syndrome," wherein the first generation of products is not quite ready for prime time. If you need any of these cards now, be prepared to download driver fixes on a regular basis.

THE WINNING EDGE

Hemmed in by the operating system and networking software, Fast Ethernet is not likely to be the Holy Grail for network users tired of twiddling their thumbs as they wait for a job to make its way to the printer. If you already have a 10BASE-T network in place, it probably doesn't make sense to switch everyone in the office to Fast Ethernet, because the costs associated with new cards, hubs, and perhaps wiring are not likely to be recouped by an officewide increase in productivity. On the other hand, Fast Ethernet cards do run noticeably faster than their 10BASE-T counterparts and do offer a way to separate high-traffic portions of a network from the rest of the office.

If you're considering Fast Ethernet for your network, our advice is to take it gradually. If your wiring is already up to 100BASE-T standards, it's easy to experiment. Buy a Fast Ethernet hub and NICs for your file server and a few of your users who tend to be very active on the network. Take notice of the impact the change has on those users and on those who no longer have to compete with them for access to the 10BASE-T network.

Once you're ready to upgrade to Fast Ethernet, the most important consideration in picking a card is speed. Cards are nearly identical in features, and most vendors offer toll-free tech support (Farallon and Sonic are the exceptions) and lifetime warranties. Price is also significant: PCI cards average $100 less each than NuBus cards, because they require fewer chips and because PCI-card components (used in large quantities in the PC world) are less expensive than NuBus-card parts.

We suggest that you use the AsantéFAST 10/100 for both NuBus and PCI Macs. The Asanté cards offer the best overall package for both (estimated street prices of $319 and $199, respectively). In addition, Asanté plans to bundle its NetDoubler software (see the "Network Pick-Me-Ups" sidebar) with each PCI card.

For now, Fast Ethernet will give you only a marginal increase in speed over your current 10BASE-T setup. But remember, the reason for that small increase is not that the Fast Ethernet cards themselves aren't working right; rather, Open Transport and portions of the Mac OS inhibit speed. Hopefully, when Open Transport matures as a technology and software drivers become fully native, your investment in Fast Ethernet will *really* start to pay off.

MacUser Associate Editor Shelly Brisbin hooked up her first Mac network in 1986. She has a box full of LocalTalk connectors she's selling really cheap. MacUser Labs Senior Project Leader Kristina De Nike managed the testing for this report, assisted by Associate Project Leader Jim Galbraith.

NetBench 4.01, the benchmark software used for testing in this report, is available online on ZD Net from Ziff-Davis Benchmark Operation at http://www.zdnet.com/zdbop/.

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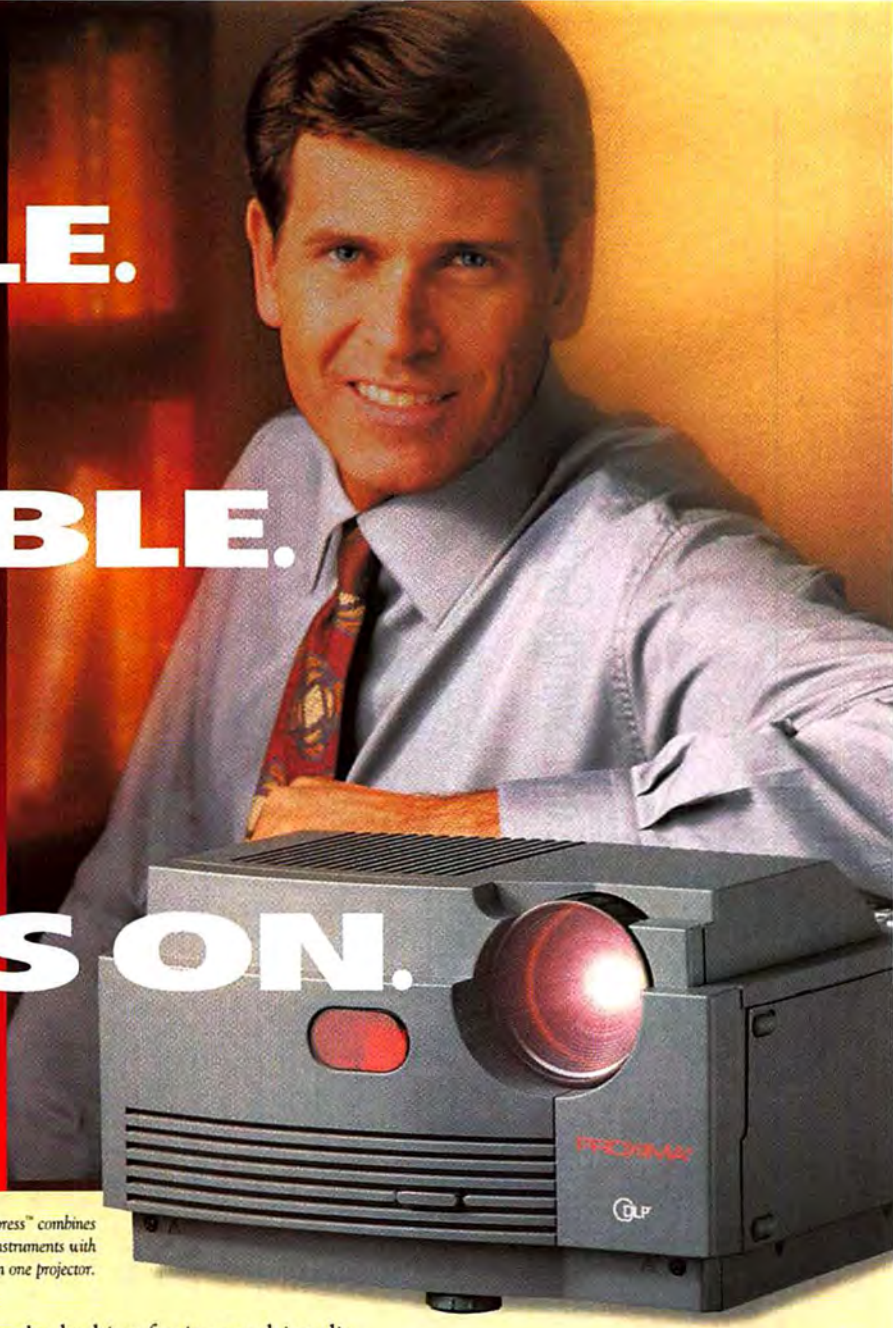

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CIRCLE **129** ON READER SERVICE CARD

QUICK LABS

Late-Breaking Reviews of Printers, Monitors, and Storage Systems

A PowerMax Power Play

Three of the four monitors we reviewed this month are solid performers. Two new PowerMax monitors — the 15-inch TX-1664 and the 17-inch TN-1885T — and the 17-inch Eizo Nanao FlexScan TX-C7S did well on our image-quality tests. The fourth monitor, the 17-inch Nokia Valuegraph 447W, still has plenty of room for improvement.

Not only do the PowerMax monitors display good-looking images but both are also affordably priced — $449 for the TX-1664 and $999 for the TN-1885T. Each monitor comes equipped with a Sony Trinitron tube. Neither monitor has color-option controls, but the on-screen geometric controls that are provided are adequate for maintaining image quality.

We were impressed with the image quality of the Eizo Nanao FlexScan TX-C7S ($1,189). Sporting a new, sleek case design, the monitor comes bundled with Eizo's ScreenManager Pro software, which lets you fine-tune your display. With the convenient on-screen controller, you can make all image adjustments by clicking on a button. Although the controller is easy to use, we found the small size of the button to be a drawback. You can buy a speaker base for the FlexScan TX-C7S for $79.

We were disappointed by the Nokia Valuegraph 447W ($799). The image quality was unimpressive, regardless of the image settings. The on-screen controls were awkward to navigate but were adequate for basic image adjustment.

The image-quality scores reflect the results of our tests for image sharpness, focus, brightness, uniformity, pincushioning, color range, color accuracy, and vibrancy. A score of 1.0 or better is considered acceptable.

REVIEWER AND TESTER / MARTIN WONG

The affordable PowerMax monitors have excellent image quality.

SCREEN IMAGES / © WALT DISNEY

PHOTOGRAPHY / PAVLINA ECCLES

	PRODUCT	ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS
🖱🖱🖱🖱	**Eizo Nanao** FlexScan TX-C7S	$1,189	17 in.	1,280 x 1,024 pixels	3 years	●	+	+	Fine image quality and image-adjustment controls.
🖱🖱🖱🖱	**PowerMax** TN-1885T	$999	17 in.	1,600 x 1,280 pixels	3 years	●	●	●	Nice image quality, but lacks color controls.
🖱🖱🖱🖱	**PowerMax** TX-1664	$449	15 in.	1,280 x 1,024 pixels	3 years	●	●	●	Nice image quality, but lacks color controls.
🖱🖱🖱	**Nokia** Valuegraph 447W	$799	17 in.	1,280 x 1,024 pixels	3 years	●	●	●	Enclosure available in black or beige.

IMAGE-QUALITY SCORE

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

+ / OUTSTANDING ● / ACCEPTABLE − / POOR

Four Great Storage Options

The two hard drives we reviewed this month, the $499 Optima MiniPak 1000 and the $369 MacProducts Magic Quantum Fireball 1.2-GB, are great for providing extra storage space.

The MacProducts drive is slower than the Optima drive, but it comes with the added perk of 30 MB of shareware and a System Folder preinstalled on the disk. You can download the shareware games, utilities, and other useful applications from the Internet, but having them preinstalled on the disk is nice. The Optima drive has a smaller footprint than the MacProducts drive, making it the more convenient choice for travelers.

We also tested the $2,299 Plasmon Cheetah Plus optical drive. It uses magneto-optical (MO) cartridges with a capacity of 2.6 GB each and can also use 1.2-GB cartridges. The Cheetah Plus is fast for an MO drive; its MacBench 3.0 Disk Mix score comes close to that of many hard drives. Note: Be ready to pay an extra $40 to $50 for a SCSI cable — the Plasmon Cheetah Plus doesn't ship with one.

We were pleasantly surprised to find that we could use virtual memory with the Plasmon drive. Normally, the virtual-memory option in the Memory control panel is disabled when you boot from a removable-media drive.

If you need an affordable MO drive, take a look at the APS 2.6-GB MO drive. At $1,799, it's $500 less than the Plasmon drive. Like the Plasmon drive, the APS drive uses two-sided 2.6-GB MO cartridges; however, the APS drive is significantly slower.

REVIEWERS / KRISTINA DE NIKE AND CHRIS MORENO
TESTER / CHRIS MORENO

The Optima MiniPak 1000's diminutive case will help you keep your desktop clutter-free. The $499 drive is also small enough to take on the road.

	PRODUCT	ESTIMATED STREET PRICE	WIDE SCSI	FORMATTED CAPACITY	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/ MANUALS	SUPPORT	COMMENTS
4½	**Optima** MiniPak 1000	$499	no	1.0 GB	$.49	2 years	+	+	●	Drive has a small footprint.
4½	**MacProducts** Magic Quantum Fireball 1.2-GB	$369	no	1.1 GB	$.33	3 years	●	●	+	Sturdy drive with an affordable price.
4½	**Plasmon** Cheetah Plus	$2,299	no	2.4 GB	$.94	1 year	●	●	●	Does not ship with SCSI cable; good speed.
4	**APS** 2.6-GB MO	$1,799	no	2.4 GB	$.73	1 year	●	●	+	Like the Plasmon drive, uses two-sided cartridges.

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

Versatile Performer from QMS

QMS touts its latest printer, the $6,999 QMS 2425Ex, as a print system that offers more than standard workgroup printers do. The good news is that if you need duplexing, stapling, and collating capability as well as remote-configuration software, the 2425Ex is ready to go to work. The bad news is that all the hardware options are sold separately.

With a vendor-rated speed of 24 ppm, the 2425Ex comes with two 500-sheet paper trays and a 100-sheet manual-feed tray. The printer has the same Canon print engine as the HP LaserJet 5Si MX (see Quick Labs, April '96, page 88). QMS offers the following add-ons for the 2425Ex: a duplexing unit ($599), an envelope feeder ($599), a 2,000-sheet input deck ($1,299), a three-bin stapler ($1,499), and a copier ($1,999).

Out of the box, the 2425Ex comes with 24 MB of RAM and an internal 256-MB hard drive for downloading fonts and documents. The printer can print tabloid-sized pages with a maximum resolution of 600 dpi. If you upgrade the RAM to 36 MB, the 2425Ex can print tabloid-sized pages at 1,200 dpi.

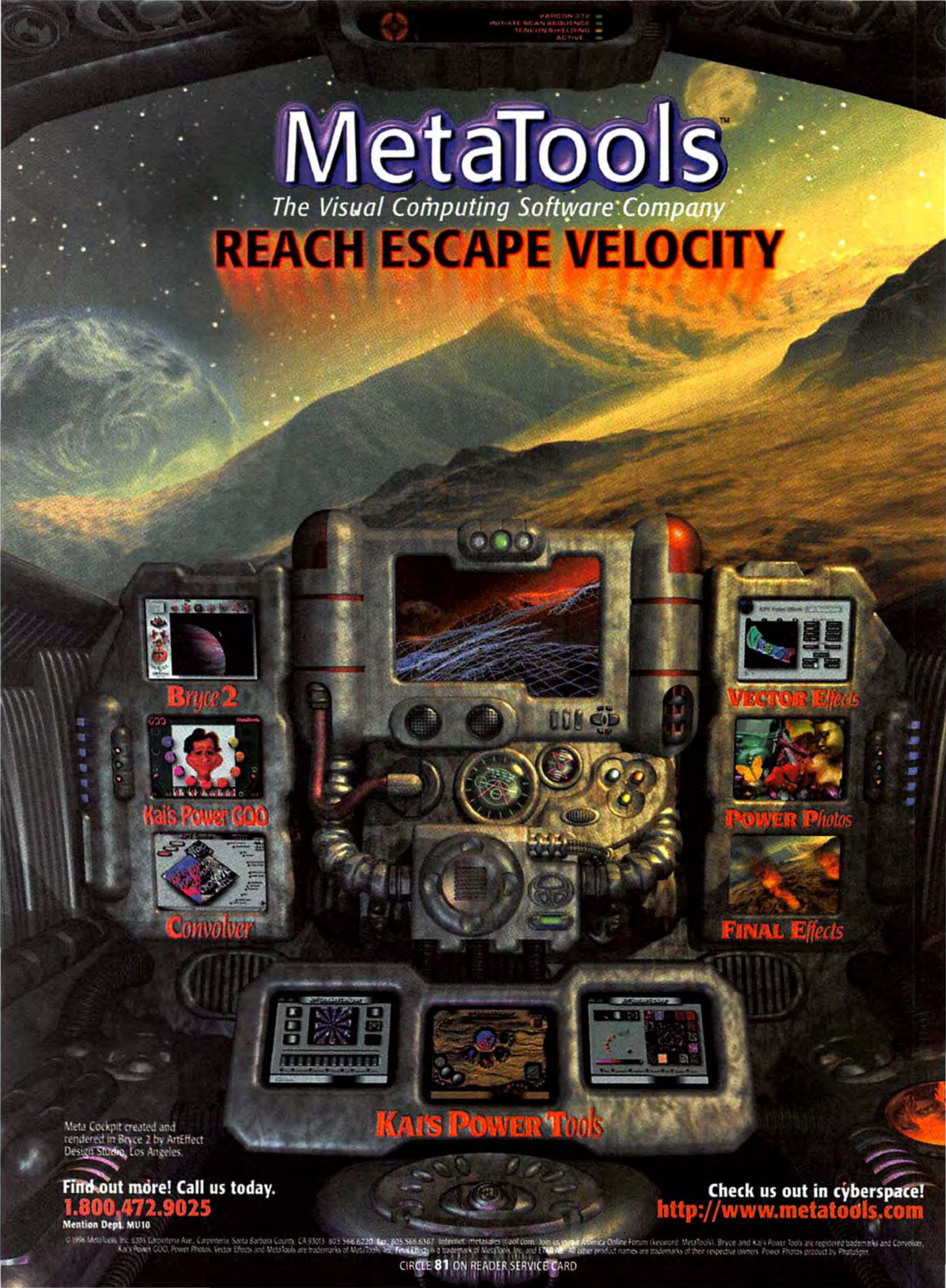
The 2425Ex's text quality is fine at 600 dpi, but fine lines in line art tend to be a bit heavy. Another problem that will affect the printer's popularity among graphics users is the banding that occurs in full-page grayscale images. Banding is not a significant problem, however, with smaller-sized images.

REVIEWER / ROMAN LOYOLA TESTER / MARTIN WONG

The QMS 2425Ex is the ultimate paper shuffler.

	PRODUCT	ESTIMATED STREET PRICE	COLOR OR MONOCHROME	TECHNOLOGY	MAXIMUM RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS
4½	**QMS** 2425Ex	$6,999	monochrome	laser	600 dpi	1 year	●	●	+	●	Lots of paper-handling add-ons.

GET INFO / **APS Technologies** 816-483-6100 **Eizo Nanao** 310-325-5202 **MacProducts USA** 512-892-4070 **Nokia** 415-331-6622 **Optima Technology** 714-476-0515 **Plasmon** 408-474-0100 **PowerMax Computing** 503-232-9903 **QMS** 334-633-4300



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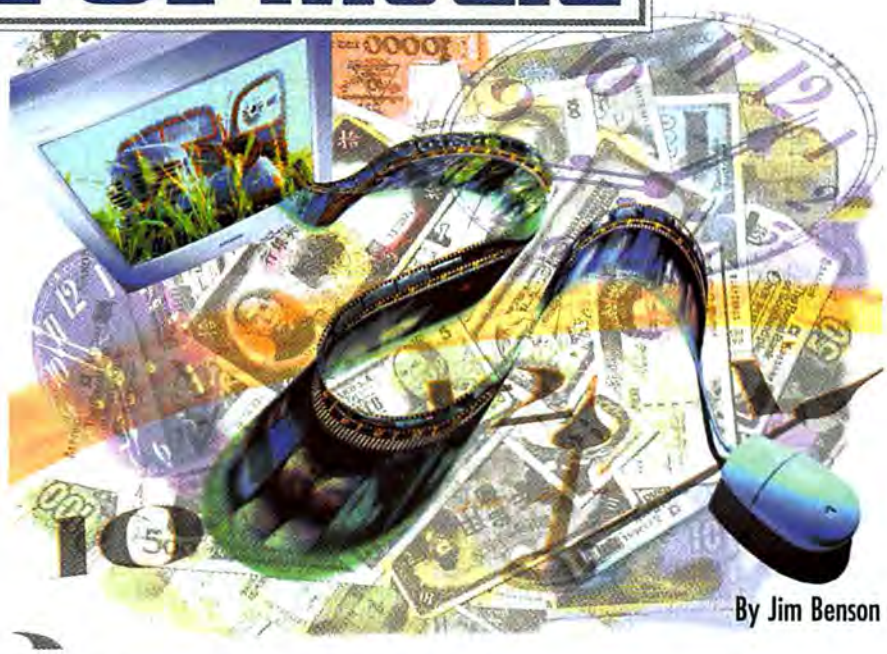
CIRCLE 81 ON READER SERVICE CARD

Buying stock photography is now as easy as hooking up a modem and getting on the Web. It's fast, convenient, and available around the clock. But is it foolproof?



By Jim Benson

Buying Stock Photos Online

STOCK PHOTOGRAPHY has come a long way, from transparencies sent via courier to scanned images available on CD-ROM. Now even stock-photography providers have jumped onto the Internet and online services to sell their wares. The benefit is instant access (even at 2 A.M.), faster delivery (at 2:07 A.M.), and lower prices (well, usually). And as with the earlier transition from film to digital scan, several innovative companies — notably PhotoDisc and Picture Network International — are leading the way.

In many respects, the online model of purchasing images parallels that of the traditional stock agency. Designers and art directors frequently turn to stock agencies when their budget or deadline doesn't allow for a specific photo shoot. In the traditional scenario, the designer selects an image in a stock agency's catalog and requests that similar images be sent, or the designer asks the agency to do the searching. (A search usually costs $60 to $90.) The designer receives a selection of transparencies and then scans the chosen one at low resolution for use as an FPO (for position only) image. A final price is then negotiated based on photographer, distribution, size, and so on. It can range from a few hundred dollars for a small image with little distribution to $3,000 or more for an image on a cover of an annual report to be distributed worldwide. Additionally, this fee covers only a single use of the image; if you want to reuse the image, you'll need to pay another royalty fee.

Today's digital services give designers a lot more freedom with a lot less headache.

Evolve or Die

Traditional stock agencies — like dinosaurs sensing warmer weather — are cautiously beginning to test various high-tech alternatives for delivering their images, although they are fearful of losing control of how their images are used. Many of the bigger agencies offer CD-ROMs containing several thousand low-resolution images for use in comps. Most agencies also now deliver their images on electronic media (such as SyQuest cartridges or CD-ROMs) instead of transparencies, eliminating the scanning step.

Comstock is a good example of a relatively forward-thinking traditional stock agency. It offers a CD-ROM collection and also maintains its own electronic bulletin board, which it uses in two ways. First, it makes available low-resolution (500K) versions of nearly all the images in its catalogs for customers to download free of charge. Additionally, if you call the company to request its usual image-search service, it can post the results on the bulletin board for you to download. When it comes time to negotiate the price of the high-resolution image and acquire it, you do it in the traditional way, via phone and overnight mail, although Comstock will deliver the image on a CD-ROM instead of a transparency if you prefer. A Comstock representative stated that the company is readying a spiffed-up version of this service, with many more images, for release on the Web in the near future.

Meanwhile, the digital newcomers — like mammals running between the legs of a brontosaurus — are trying various ways to capture the new market of technologically savvy, instant-gratification-oriented, cost-conscious designers. Some new services provide only royalty-free images; others have culled images from dozens of traditional stock houses and offer powerful online-searching capabilities. These services tend to be strange hybrids of high-tech know-how and low-tech nuisance.

Design Palette (acquired by Infosafe from ITC) gives designers immediate access not only to royalty-free photos (15 volumes of

PHOTO ILLUSTRATION / BRUCE BROWN

PhotoDisc images) but to a huge clip-art and typeface library as well. The system comprises 40 encrypted CD-ROMs and a decrypting hardware device that connects to your SCSI chain. When you need a piece of art or a typeface, you can use the software's excellent browser to find an image, preview it, and check its price and then buy it and move it to your hard disk. This process is much faster than going online to find and download images (although shuffling the CD-ROMs can be annoying), but if the photo you want isn't on one of the CD-ROMs that ship with the system, you're out of luck. Also, in order to bill you, Infosafe calls a modem inside the encryption box (which must stay continuously on and connected to your system) to see what you've used — a little too much like Big Brother for us, thanks. Plus, its $39-per-month subscription fee on top of the cost of whatever image you order is pretty steep for individuals. For high-volume design studios with lots of users, its ease of use and automatic billing may make it a reasonable choice.

When The Picture Exchange (TPX) hit the streets three years ago under its former name, Kodak Picture Exchange, it offered easily the coolest way to find and acquire stock photography online. In some ways, it still does. The service offers a superb image selection (30 stock photo houses provide more than 200,000 images) and a powerful search engine that lets you include variables such as camera angle, mood, and space for copy (neutral areas where type can be placed). But it took a month's worth of calls to Kodak's new marketing partner, Sprint (the phone company), to obtain TPX software, and when it finally arrived, it was incompatible with Apple's latest system-software upgrade (7.5.3 v2.0). TPX is a proprietary system, unrelated and unconnected to the Web, which, given the migration of online services to the Internet, limits its life span. Further, Sprint charges its clients a base rate of $30 to $50 per month with additional per-minute charges (as of press time). Compare that with $20 per month for a typical Internet service provider's charges. TPX says it's currently evaluating the Web as a delivery vehicle.

Net Darwinism

For the most evolved way of browsing images, the Web is where it's at. A good place to start is Joel Day's Stockphoto (see figure 1), a listing of stock-photo houses (http://www.curtin.edu.au/curtin/dept/design/STOCKPHOTO/StockWebSites.html). Most of these sites, though, are little more than visual résumés for individual photographers or small stock agencies.

A few of the traditional stock agencies are beginning to offer limited numbers of their images online; among them are West Stock's Muse service (http://www.weststock.com/), Index Stock (http://www.indexstock.com/), and Black Star (http://www.blackstar.com/). None of these sites offers any true searching capabilities: Muse and Index Stock force you to choose from a huge list of provided keywords, and narrowing the search is awkward. Black Star is even worse. The site's home page misleadingly invites you to "find a picture" from a library of 3 million images, but the image browser has no search function at all. Instead, you're shown a random selection of images from the collection. And none of these three agencies lets you download high-res images and pay for them online, although Index Stock provides a consumer-oriented area where you can download low-resolution (2 MB) images for nominal fees ($5 to $50 each, depending on the intended usage).

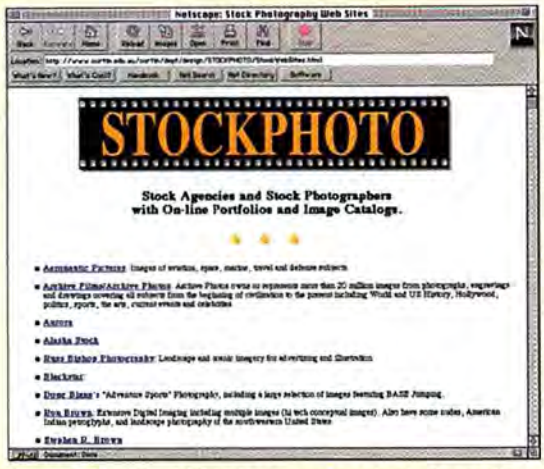


figure 1 / Joel Day's Web site serves as a clearinghouse for other Web sites that feature stock photography.

figure 2 / Digital Stock's new service offers a Similar button, so you can quickly fine-tune your searches.

One stop on your search for photos on the Web should be the site of CD-ROM purveyor Digital Stock (http://www.digitalstock.com/). The beta version of this site (see figure 2) featured a search engine with a thesaurus as well as a "similar to" feature that let you follow the trail of an image. For example, after seeing the results from a search of couples on the beach, you could click on a thumbnail of an elderly couple to display other photos of seniors. After the site's launch, in July, you can't order individual images online but you can order the CD-ROM the royalty-free photos reside on.

At press time, there are only two Web sites that offer complete stock-photo services: PhotoDisc (http://www.photodisc.com/) and Publisher's Depot, from Picture Network International (http://www.publishersdepot.com/). For services that have been active for less than a year, both sites have a lot of traffic, indicating the potential of Web-based image retrieval. PhotoDisc (see figure 3) registers more than 1,000 visitors daily, and Publisher's Depot registers more than 5,000 visitors daily. Both let you perform sophisticated Boolean searches for images; view and download comp images of varying sizes; store photos in a "shopping cart" for purchase; price the photos; and once you've agreed to the licensing terms, download high-resolution images. It's pretty simple. But the sites have their differences. Here's how these two leaders match up in terms of image quantity, image quality, search capability, reliability, additional content, and cost.

With more than 340,000 images online from over 60 stock-photo providers, the easy winner for sheer quantity is Publisher's Depot (see figure 4). PhotoDisc currently has 20,000 images online — all from its own commissioned collections. However, the company is planning to add 30,000 images by the year's end. More total images usually means you'll get more to choose from, come search time. For instance, our search for aerobics classes

For years, creative professionals have relied on award-winning UMAX scanners to capture the high quality images they demand as an essential part of their creative solutions. Now, UMAX has come full circle by offering them the ultimate computers on which to realize their vision...

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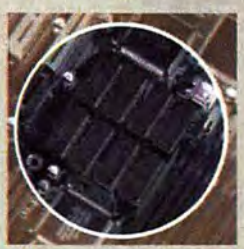
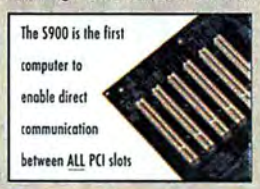


1 Interleaved Memory

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.

3 Exclusive PCI-to-PCI Bridge

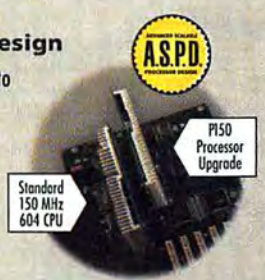
Not only does the S900 have an amazing 6 PCI slots, it is also the first to enable burst communication between them.



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.

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.



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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▶ SuperMac S900L	Tower	604	150 MHz	2 Gbyte	6	16 MB	512 K	6.7x Speed	4MB VRAM	5	$4395

* Suggested Retail Price

UPGRADE OPTIONS		PRICE*
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▶ SuperMac P150	604-150 ASPD Processor Upgrade	$995

* Suggested Retail Price

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CIRCLE **126** ON READER SERVICE CARD

figure 3 / PhotoDisc's Web site features the company's high-quality images in three resolutions at reasonable prices, depending on usage.

figure 4 / Publisher's Depot, from PNI, offers a wide selection of graphics tools in addition to 340,000 stock photos.

yielded 26 usable images at Publisher's Depot versus 3 usable images at PhotoDisc's site. Furthermore, Publisher's Depot also offers fonts, illustrations, cartoons, and works of art (and soon, sounds and movies). PhotoDisc offers photos only.

In image quality, PhotoDisc has the edge. Although its images are typically smaller than those from Publisher's Depot — 10 MB versus 18 MB — PhotoDisc's drum-scanned images show better shadow detail than the images that were scanned with Publisher's Depot Photo CD workstation scanners.

When you're searching for specific images, Publisher's Depot lets you use "natural language" phrases to describe what you're looking for (such as "pair of hands holding gold coins") instead of PhotoDisc's simple keywords. You can also include the predominant hue as a factor in your search in Publisher's Depot. We found occasional keyword inaccuracies in both systems, though, and both occasionally turned up mystery images — visual non sequiturs.

In our tests, almost every aspect of browsing, purchasing, and downloading went more smoothly on Publisher's Depot than on PhotoDisc: Thumbnails were displayed more quickly, the software was more intelligently laid out, and we experienced no system freezes with Publisher's Depot and several with PhotoDisc. Logging onto PhotoDisc's site was a problem for us: PhotoDisc needed to lend us a properly configured PowerBook for the duration of our testing process. (However, the bug in PhotoDisc's server software that caused the problem for us and other users should be fixed by the time you read this.)

Publisher's Depot also features a handy Lightbox feature, which lets you store a group of thumbnails that a client or your boss can view from a remote site, using a password you provide. Publisher's Depot deserves one black mark, though. Many of the images (nearly half of our test images) aren't priced online, because the stock provider still wants to negotiate the old-fashioned way. To complete a transaction, you need to call PNI to get the price. That's like two steps forward, one step back.

But where PhotoDisc really shines is cost. Fifty bucks buys you a high-resolution (10 MB), royalty-free image for use in nearly every print application, and $80 gets you the same for Web or multimedia uses. Since a high percentage of Publisher's Depot images are not royalty-free, a similar high-resolution image might cost $300 or $3,000, depending on how it's going to be used — again, reminiscent of the situation with traditional agencies. Neither service charges for access to its site.

Although PhotoDisc has promised to complete an interface-lift, a keyword review, and a speed boost for its Web site by the time you read this, the prize for the top stock-photo Web site at press time goes to Publisher's Depot. But truthfully, you'd be cheating yourself by not checking both sites when you're image-hunting — the PhotoDisc site may have the perfect image at a tenth of the cost.

The traditional stock-photo industry continues to grow every year, so most of the big agencies have little incentive to create expensive Web sites to hustle their images. But by running on the bleeding edge of technology, PhotoDisc and PNI have created a substantial niche market for themselves: designers in a hurry or on a budget. Thank goodness, you'll say after that successful 2:07 A.M. download, mopping the sweat from your brow. Thank goodness they're out there.

Jim Benson is a writer and designer who lives in San Diego, California.

Taking Stock / a directory of online photo services

Service	Company	Phone Number	Internet Address	Pros and Cons
Comstock	Comstock	800-225-2727 or 212-353-8600	service@comstock.com	Convenient for current Comstock clients. No search capability. Bulletin-board-like interface.
Design Palette	Infosafe Systems	800-625-3880 or 212-867-7200	http://www.designpalette.com/	Fast image access. Proprietary, non-Internet system. High monthly fees.
Digital Stock	Digital Stock	800-545-4514 or 619-794-4040	http://www.digitalstock.com/	Beta version looked promising, but users must purchase CD-ROM.
PhotoDisc	PhotoDisc	800-528-3472 or 206-441-9355	http://www.photodisc.com/	High-quality drum-scanned images. Good prices. Interface needs streamlining and speed.
The Picture Exchange	Sprint	800-579-8737 or 816-854-2688	none	Good selection. Proprietary, non-Internet system.
Publisher's Depot	Picture Network International	800-764-7427 or 703-312-6210	http://www.publishersdepot.com/	Largest image selection. Easy to use. Can be expensive.

In Moving Color

MediaPaint and Adobe After Effects help a character dash from grayscale to color.

AMONG THE MOST POPULAR techniques for animators, rotoscoping is high on the list. Rotoscoping essentially means tracing the movements of filmed objects and using those motions to give life to your effects. For example, you might trace a bouncing ball's motions and use the lines to animate a bouncing head, or trace a person walking to create a cartoon character with a realistic stride.

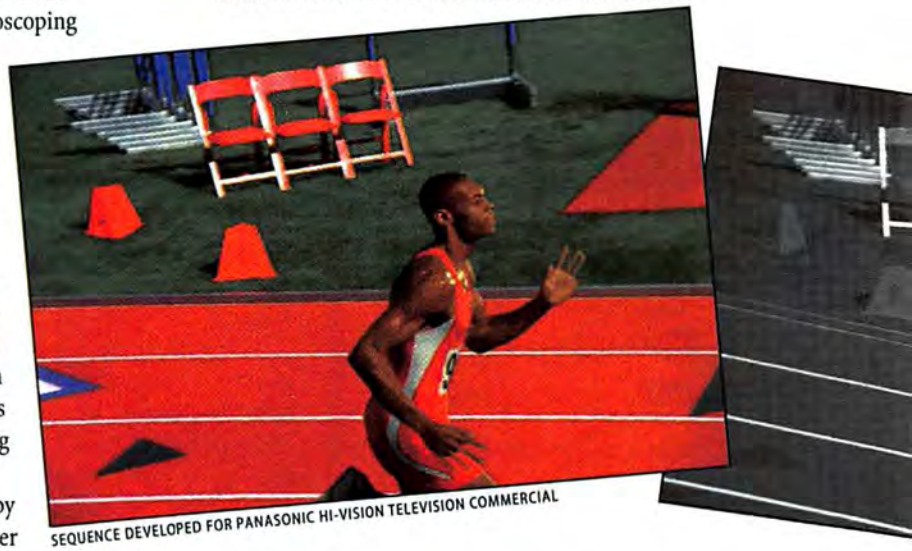
Traditional animators rotoscope by stacking celluloid frames on light boxes and tracing a reference object's subtle shifts from frame to frame. But with the right software, your computer can be your light box, displaying layered movie frames as if they were stacked, with light streaming through them.

In this example, which uses original artwork by Chris Casady, I used rotoscoping with a few other tricks to create the effect of a runner in a grayscale movie passing through a barrier and emerging in color. This effect can be used for any moving character. It involves tracing the character's outline to create a mask that lets you composite the original color footage of the character into a grayscale version of the movie.

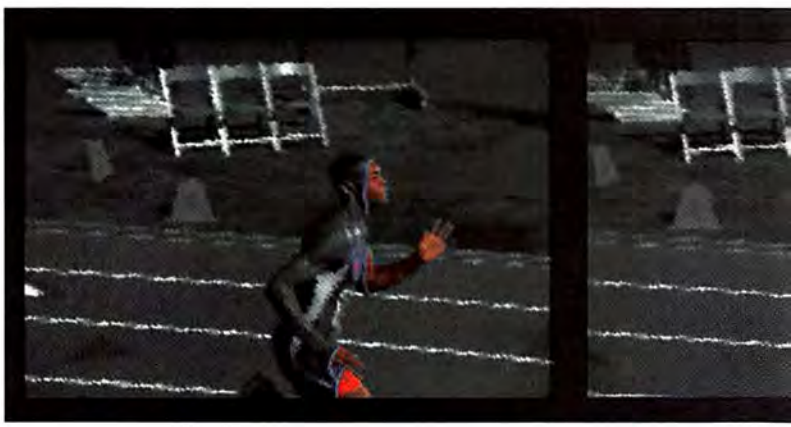
Both Strata's MediaPaint and Fractal Designs Painter support rotoscoping. I chose MediaPaint for this project, because it lets you save art (user-created elements) and original footage as separate files for compositing. I also used Adobe After Effects to create a grayscale version of the movie and to perform the final compositing of separate layers with maximum control.

Digital designer Lynda Weinman is the author of Designing Web Graphics, *1996. Her home page is at http://www.lynda.com/.*

1. CREATE A GRAYSCALE VERSION OF YOUR FOOTAGE.



SEQUENCE DEVELOPED FOR PANASONIC HI-VISION TELEVISION COMMERCIAL



STEP BY STEP

1. CREATE A GRAYSCALE VERSION OF YOUR FOOTAGE. Convert the original color footage to grayscale, using After Effects' tint filter (Effects: Image Control: Tint). Save this version as a new file.

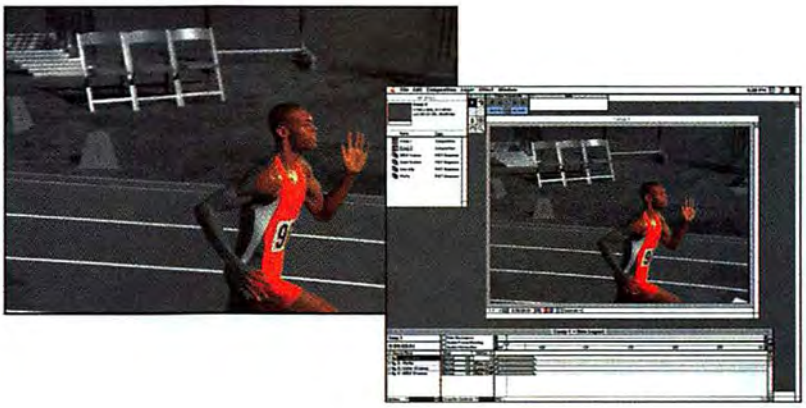
2. DRAW THE LEADING EDGE OF YOUR EFFECT ACROSS THE FRAMES TO CREATE A LINE LAYER. Open the color movie in MediaPaint, and turn on the "light box" (Arrange: Turn LightBox On). With the light box on, a ghost image of one or more frames appears so that you can see precisely where to apply your effect as the object changes. Moving from frame to frame with the arrow keys, I drew lines with the tool palette's Fine Brush plug-in and white paint to show how I wanted the color edge to move. Save the lines as a separate file, by choosing Clear Movie (Edit: Clear Movie) and saving as a QuickTime movie. The Clear Movie command makes the footage disappear and creates a movie of the art.

3. PAINT OVER THE OBJECT TO CREATE A MASK LAYER. Once you've drawn the lines, you're ready to use them as outlines for a mask. Paint a solid white mask over your character's body, using your lines to see where the character will emerge in color as the frames play. Choose Clear Movie (Edit: Clear Movie), and then save the mask as a QuickTime movie.

2. DRAW THE LEADING EDGE OF YOUR EFFECT ACROSS THE FRAMES TO CREATE A LINE LAYER.

3. PAINT OVER THE OBJECT TO CREATE A MASK LAYER.

4. COMPOSITE THE LAYERS.



5. ENHANCE THE EFFECT WITH FILTERS BEFORE RENDERING.

4. COMPOSITE THE LAYERS. Import all the movies in order (grayscale, original color, mask only, and line only) into After Effects for final compositing. In the pop-up menu in the Time Layout window, change Switches to Transfer Controls. In that same window, select your color movie and set it to a luma-based track matte. The luma matte in effect turns your white mask transparent, allowing the underlying color image to show through. As the frames play, the mask will gradually reveal the color character, making him appear to slip out of the grayscale dimension.

5. ENHANCE THE EFFECT WITH FILTERS BEFORE RENDERING. Before you render your footage as a QuickTime movie in After Effects, you can jazz it up with filters. I isolated the line element with the luma key (Effect: Keying: Luma Key) and made it a blue glow by using a Gaussian blur (Effect: Glow & Sharpen: Gaussian Blur) and color (Effect: Image Control: Color Balance). To increase the line's opacity, I also replicated the layer a few times.

As a finishing touch, I applied the brush-stroke effect to the grayscale layer (Effect: Stylize: Brush Strokes).

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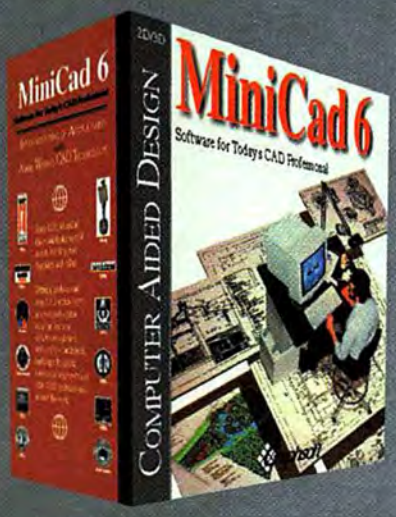

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CIRCLE 11 ON READER SERVICE CARD

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EXPERT TIPS / By Bob Schaffel and Chuck Weger

Crossing the Platform

Are there tricks for moving graphics files between Macs and PCs? Our experts tell you.

SO YOUR BOSS bought into the "Apple is going under" hysteria and hedged his bets by purchasing a PC or two. Now *you're* expected to find a way to get those PC files into the Mac (and vice versa) so you can finish your projects. How? The answer has two parts: logistical and logical.

Let's start with the logistical, which in this case means getting the bits from here to there somehow (we'll deal with the logical — translating the contents of these files between Macs and PCs — in another column). For physically moving data between platforms, you've got three basic choices: good old sneakernet, a real network, or a direct connection.

Just Do It

For sneakernet, you get to choose among all kinds of removable media. Floppies work fine for small files (just make sure the disks you use are the 3.5-inch high-density kind, with a hole on each side). Of course, not much fits on a floppy these days, so instead use higher-capacity removable media, such as Bernoulli (Zip, Jaz), SyQuest, or various optical cartridges. The trick is, whichever drive you use has to connect easily to a PC.

All Macs use SCSI, so it's usually no problem connecting removable drives to Macs. But the PCs you're connecting to may not have SCSI ports (many don't), requiring expensive workarounds. And even if they do, the PCs' software drivers may not understand your removable-media device. If this is the case, it's time to talk to your local PC guru. Windows 95 has relatively problem-free driver installation (OK, we know the jokes are coming).

In our experience, you're better off formatting the removable media (floppy, MO cartridge, whatever) on the PC. Then you can use PC Exchange (part of System 7.5.x) or Access-PC (from Insignia Solutions) to read it on the Macintosh.

A nice sneakernet solution we've used recently involves connecting a pair of Iomega Zip drives, one to each machine. In addition to the SCSI Zip drives geared for Macs, there's a Zip model that plugs into the PC's parallel printer port, which means there's no special SCSI card to buy and install and fewer software headaches. The trade-off? The parallel-port version is slower than the SCSI version.

Net Worth

If both the Mac and the PC are on a network with a common file server, the solution is pretty simple: Just drag the file from the Mac to the server (or from the PC to the server) and reverse the process on the other end. End of story. The drawback is you're copying the file twice — once to the server and again to the other machine — but that's a pretty small price to pay for such convenience. This approach works fine with Novell servers, Windows NT servers, and certain UNIX servers. But here's the kicker: It doesn't work with AppleShare servers! PCs have no built-in client software for talking to Mac servers. Luckily, you can get Apple's AppleShare Client for Windows (bundled with Apple Workgroup Servers or purchased separately); also check out Miramar's PC AppleShare client software.

If you're not connected to a common server, it gets more complicated. If both computers are already connected to an Ethernet network, you can skip the next paragraph. If they're not, read on.

Connecting a Mac and a PC to Ethernet is pretty simple these days. Many Macs have Ethernet built in, and on the PC side, plenty of inexpensive Ethernet network cards are available. For 10BASE-T (twisted pair — the only Ethernet to use these days, until 100BASE-T gets affordable), you then need a hub to connect the two computers. If you're on a really tight budget, you can instead get a "crossover" 10BASE-T cable, which for about $15 allows you to connect a PC to a Mac without using a hub.

Once both machines are on Ethernet, use Farallon's Timbuktu to do a simple file transfer in either direction or use a Mac-friendly peer-to-peer connection from Miramar and turn on the Mac's file sharing so the PC can see the Mac.

A more technical approach but one that has the advantage of being inexpensive is to pretend that you're on the Internet. Run FTP server software on one machine — NetPresenz, $10 shareware (http://www.share.com/peterlewis/), is one good product for the Mac — and FTP client software such as Navigator on the other machine. Now you can just send your files across via FTP as if you were on the Web. To do this right, of course, you have to set up TCP/IP properly on both machines. Phew!

Plugged In

The ultimate low-tech solution involves connecting the two platforms by using a modem cable on your Mac, a modem cable on the PC, and a null modem (a $5 adapter box from Radio Shack or any good computer store) in between. Then run a telecommunications program that supports the Zmodem file-transfer protocol, such as ZTerm or MicroPhone, on the Mac and a similar program on the PC. Set one machine to upload files and the other to download them. Voilà! Slow but cheap.

OK, so you got the file across. You're finished, right? Wrong! (Bet you knew we were going to say that.) Just getting the bits from point A to point B is only the first step. Coming soon: Getting your applications to actually *use* the files you've just transferred.

Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a graphic-arts consultant and a partner in Genex Media, a company specializing in new media and Web design.

ILLUSTRATION / KEVIN CURRY

INSIGNIA SOLUTIONS

Okay, so you're going to run Windows on your Power Mac.

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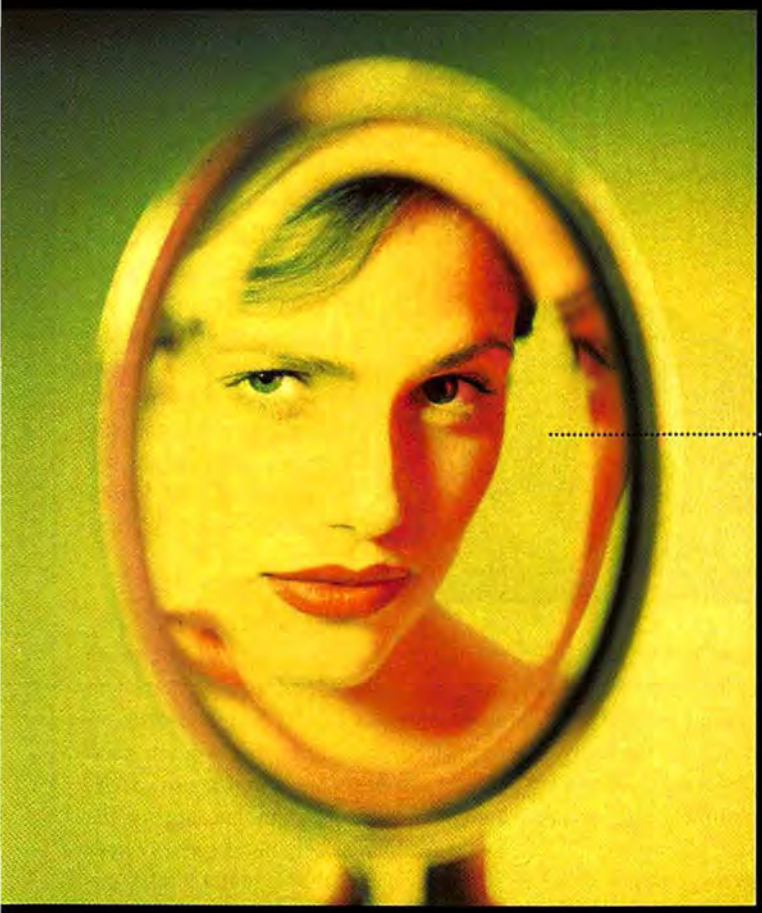

You're Intelligent.

You really need to run Windows. SoftWindows from Insignia Solutions is the only software that lets you do it on your Power Mac. Your keen mind instantly puts two and two together.

You Know The Value Of A Dollar.

SoftWindows 3.0 costs roughly $299. Apple's DOS Compatibility Card, about $749. Plus another ten bucks or so for the screwdriver you'll need to install it.

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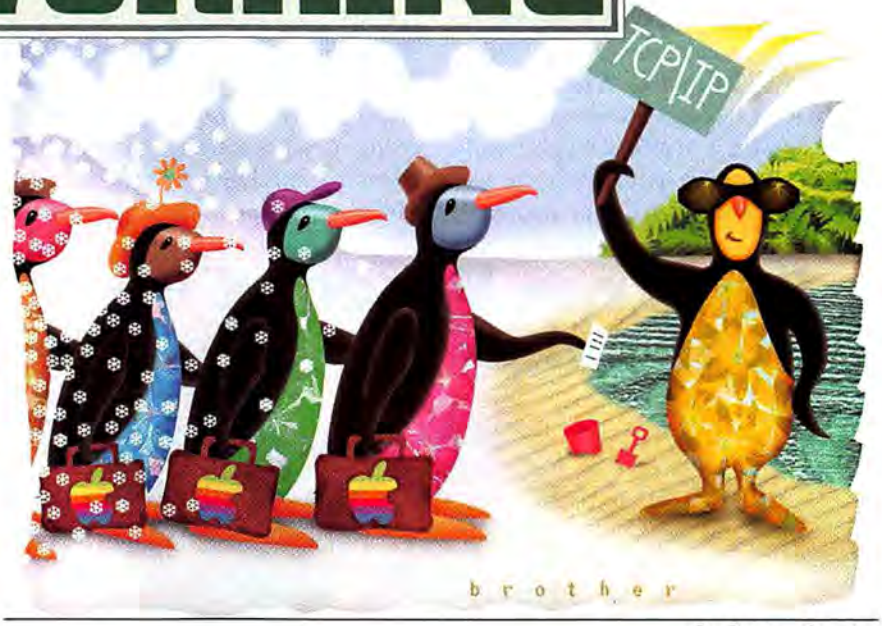
NETWORKING



It's fast, it's cross-platform, and it gets you onto the Net. But TCP/IP won't replace your AppleTalk network — yet.

By Dorian Cougias

Migrating to IP

BACK IN THE GOOD OLD DAYS, when Macs were the only personal computers with built-in networking capability, there was only one protocol to worry about: AppleTalk. Most of us didn't worry much about it either. TCP/IP was a foreign language to Mac users — and to PC users, for that matter. Then came the Internet, and anyone who needed a Web connection had to contend with previously UNIX-only protocol to reach the Net. Today, Apple (with Open Transport) and most companies that have Macs and PCs installed have joined a parade toward TCP/IP as the standard network protocol. You may already have added TCP/IP to your network. Now the question is, Should you (or can you) make a complete conversion?

Why TCP/IP?

It was the need for Internet access that began the rush to add TCP/IP to Macs (in the form of MacTCP) some years ago. Today, though, with TCP/IP software included in Open Transport, and with more and more LANs using TCP/IP to connect to corporate networks and the Web, TCP/IP is not just an add-on but also a potential replacement for AppleTalk and other protocols that don't have built-in hooks to the outside world. Open Transport makes it possible for Macintosh users to be full-fledged IP citizens, whereas MacTCP limited the number and speed of simultaneous network connections you could make. Open Transport-based TCP/IP uses a completely new network architecture to handle multiple connections much more quickly and efficiently than did MacTCP.

Another advantage of TCP/IP is that it moves information speedily. Every protocol suite (including AppleTalk, TCP/IP, and DECNet) has its own way of packaging data and sending it across the network. AppleTalk packets are limited to 590 or so bytes of data per packet. TCP/IP, on the other hand, carries a much bigger payload (around 1,600 bytes per packet). It is this ability to deliver a greater payload that makes TCP/IP so much faster at transferring files.

TCP/IP can also be your ambassador to the non-Macintosh world. Because so many enterprisewide applications (including e-mail and database programs) use TCP/IP, you don't need to fight the corporate IS folks to keep those "nonstandard" Macs, nor do you need to educate them in the finer points of AppleTalk addressing and protocol analysis. For your part, you'll have access to more non-Mac network resources.

Organizations are gradually moving from proprietary messaging systems to Internet-based e-mail, and others are creating *intranets* — Internet-like services that reach only employees of the company.

Is It Time Yet?

If TCP/IP is faster and more cross-platform and makes Net access possible, why hasn't AppleTalk gone the way of the dinosaurs? There's a very simple answer: Many applications are still AppleTalk-only, although some key ones can use TCP/IP as well as AppleTalk. Claris' FileMaker Pro, Farallon's Timbuktu screen-sharing software, and ON Technologies' Meeting Maker, for instance, can all use either TCP/IP or AppleTalk. What do these applications have in common? They're completely cross-platform. You can share information or documents with PC users via TCP/IP or Novell's IPX.

E-mail, thanks almost exclusively to the Internet, is beating a path to TCP/IP. Although CE Software's popular QuickMail won't speak TCP/IP until later this year, Claris OfficeMail (a LAN and Internet mail system), like the

ILLUSTRATION / KELLY BROTHER

Apple Internet Mail Server, is completely TCP/IP-friendly.

AppleShare, on the other hand, doesn't support TCP/IP. You'll need an Apple Network Server or some other non-Mac OS machine that supports both AppleTalk and TCP/IP to act as a TCP/IP-based file server. The AppleTalk layer is required because AppleShare client software is AppleTalk-only. Similarly, popular information-sharing programs such as Now-Up-to-Date and many accounting packages and vertical-market applications rely on AppleTalk.

Even if all the applications you use support TCP/IP, there's still one big hurdle that will keep AppleTalk on Macintosh networks for the foreseeable future: printing. In order to use TCP/IP for printing, Apple's printer drivers must support it. Even printers that have an IP address (a series of numbers that identifies a device on a TCP/IP network) do not work with Macs, because neither Apple nor other vendors have developed TCP/IP-aware printer drivers for the Mac. The logical alternative (the method used by PCs connected to Windows NT- and NetWare-based print servers) is to send your documents to a multiprotocol server: a PC or a UNIX machine that can communicate directly with the printer or that is physically connected to it via TCP/IP. Unfortunately, you need to use AppleTalk to reach the print server — that is, until someone gets around to writing TCP/IP-compatible printer drivers for the Macintosh.

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Making a Partial Conversion

If the IP bug still has you in its grip, it is possible to introduce IP to your network or increase TCP/IP's presence without losing the AppleTalk services you need. You don't need to upgrade your Macs' networking hardware to add TCP/IP to the LAN, and many of the necessary changes, with the notable exception of configuring IP addresses (see the "Numbers Game" sidebar), are simple to implement.

If you're using pre-7.5 system software, it's time for an upgrade. System 7.5.3 includes Open Transport, which provides all the software you'll need in order to reach TCP/IP services on the network. If you have MacTCP software installed, don't sweat it: The old stuff still works well in most circumstances. If your company already uses TCP/IP internally or for Internet access, the next step is also pretty easy. You need to request a range of IP addresses from the company's IS guru or from an Internet service provider — if that's how you get your Net access. No two devices connected to the Internet can have the same IP address. You should acquire as many addresses as you can: one for each computer, printer, router, hub, or other device connected to the network. You can use TCP/IP server software to share addresses, but remember that each and every device needs an active address in order to connect to TCP/IP services — including that PowerBook you plug into the office network once a week.

Managing those IP addresses is a bit trickier than simply naming an AppleTalk device and assigning it to a zone. Because IP addresses give no clue about whom they belong to (you can't match an address to a user with network-management software, as you can under AppleTalk), you should keep careful track of who has what address and where that person's Mac, printer, and any other networkable devices are physically located. If a Mac gets moved to another building, or even

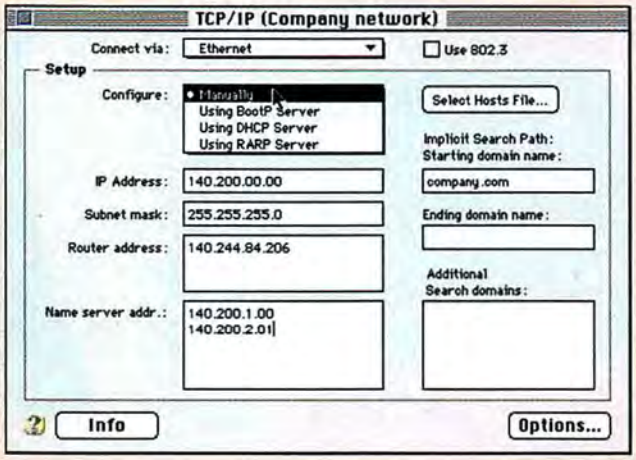
Numbers Game / choosing the right IP addressing scheme

WITH IP ADDRESSES IN HAND, you have a decision to make: How computer users and network devices will acquire the numbers they need in order to communicate with the network. You can choose to assign a specific IP address to each device *manually* or have a server allocate an address to each device as needed, *dynamically*. If you choose the manual option, you should enter the address into the TCP/IP control panel of each Mac that needs access (see figure).

Administrators who don't have enough IP addresses to go around or who want to avoid the hassle of tracking who has what IP address can store addresses on an IP server (called a BootP [Bootstrap Protocol] or RARP [Reverse Address Resolution Protocol] server). When a Mac or another device starts up, it "borrows" an IP address from the server, relinquishing it at shutdown. This method is often used to provide IP services to Apple Remote Access users when they dial into a network. A variation on the server addressing theme uses a DHCP (Dynamic Host Configuration Protocol) server to lend an IP address for only the period of time it is in use. Once you've completed an e-mail connection or a database query via TCP/IP, the server takes back the temporary address and reuses it. If addresses are very limited, this approach may be a way to give more users access to the network.

Routers must be manually addressed, because the integrity of the network depends on their being recognizable to everything else on the LAN. Hubs, bridges, and other network-infrastructure devices can take their addresses from a BootP or RARP server but can't operate with the on-again, off-again DHCP-server method. Such devices must be continually visible and accessible on the network.

Computers can use any of the three addressing schemes, with one limitation



— you can't give an IP-recognizable domain name (bob.bigcompany.com, for example) to a machine that uses DHCP addressing. The server has no way of matching IP addresses with text-based names. Manual and server-based addressing are not limited in this way.

another part of your office, you may need to assign the system a new IP address manually, so that the Mac will communicate correctly with your TCP/IP router.

It's more than loyalty to Apple that keeps the AppleTalk protocol going: Although TCP/IP has the advantage in speed, ubiquitous presence on the Internet, and cross-platform support, it has yet to supplant AppleTalk among Mac apps and printer drivers. Still, Open Transport and the growing importance of the Internet as an internal and external communications tool are bringing TCP/IP closer to your desktop. If you haven't added TCP/IP to your network, you soon will.

Dorian Cougias is president of Network Frontiers (http://www.netfrontiers.com), a San Francisco-based consulting firm.

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NET TRAVELER / By Michael Swaine

Take My Advice . . . Please

You can find good advice in any field on the Net, once you separate the wheat from the chaff.

YOU KNOW WHAT they say about free advice: It's worth just what you pay for it. But that's a cynical attitude, and you also know what they say about cynics: They know the price of everything and the value of nothing.

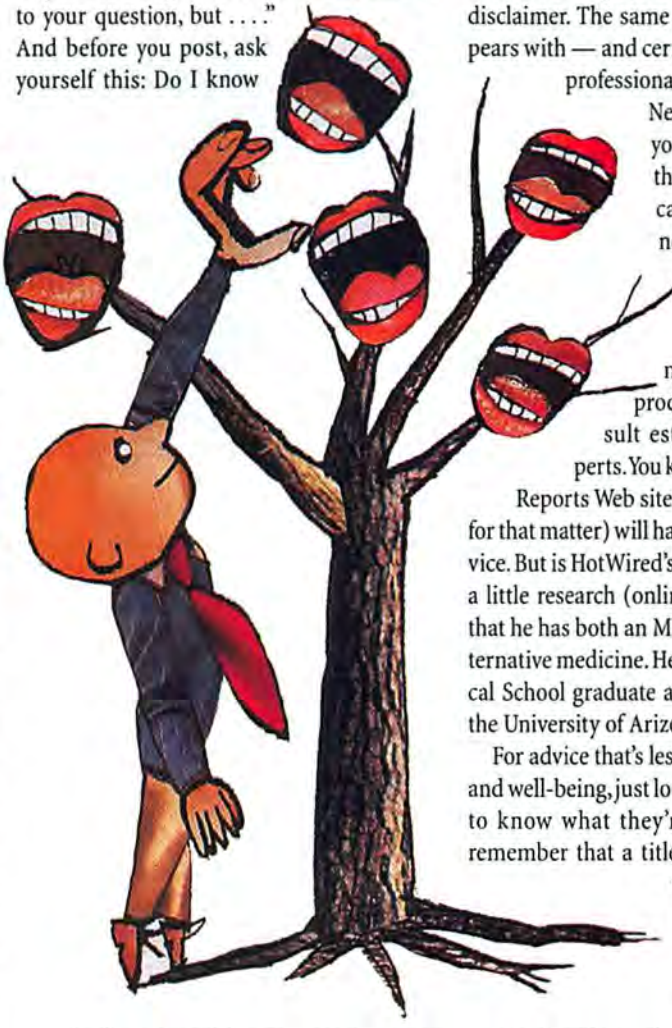
If you've ever picked up a money- or time- or sanity-saving tip on the Net, you know that online advice can be very valuable as well as downright dangerous. Here are some tips on what's out there, how to find it, and how to separate the gems from the common stones.

What's Out There. Would you like to bypass a highly paid professional? The recesses of the Net hold a lot of business and investment advice (see Net Traveler, September '96, page 97), legal advice (Nolo Press, at http://www.nolo.com/), and medical advice (Ask Dr. Weil, at http://www.hotwired.com/drweil/). You'll find advice on travel, parenting, hobbies, and sex. And for a more spiritual brand of counsel, check out your horoscope (http://www.weblifepro.com/pal/hscope.html) or turn to an angel (http://www.shebute.com/angels/forecast.html).

Many advice sources offer prefab information, but you'll also find plenty of newsgroups and Web sites where experts and peers will answer *your* specific questions. You might profit (emotionally if not financially) from the insights of Emily Postnews, Lucy Lipps, and Mr. Bad Advice (at http://www.yorku.ca/teachtec/faq/emilypn.htm, http://www.lucylipps.com/lucylips/dearlucy/, and http://www.echonyc.com/~spingo/Mr.BA/, respectively), all of whom will respond to your e-mailed queries.

Finding Advisors. If you want a stream of advice on a particular topic, such as parenting or parasailing, consider subscribing to a discussion group or mailing list on the topic. (For parenting, try the Usenet newsgroup misc.kids; for parasailing, it's rec.sports.waterski.) If you're on CompuServe or AOL, investigate the service's discussion groups first. Many are moderated by knowledgeable folk who lead conversations and know where the best resources are buried. Moderators may also clue you in about members whose advice amounts to a bum steer.

When you post a question to a news or discussion group, be prepared for the first three responses to begin, "I don't know the answer to your question, but . . . ." And before you post, ask yourself this: Do I know enough about the subject to recognize good advice when I get it? If not, don't bother to ask: Head straight for the FAQ (frequently asked questions) file. Usenet newsgroups, mailing lists, and larger Web sites often answer common questions in a FAQ. You'll find lots of FAQs in news.answers.



Even if there is no FAQ that addresses your interests, some clever sleuthing may uncover the advice you seek. Use a search engine that speaks Usenet. Excite's concept-based searching is especially useful when you're looking for advice: http://www.excite.com/.

Just Who Is This Guy? Newspaper columns on medical, legal, or financial topics carry a disclaimer. The same disclaimer usually appears with — and certainly applies to — any professional advice you find on the Net. Take it to heart. But you need to go a step further with Net advice, because, as you may have noticed, any bozo can set up a Web site.

For the really heavy stuff, such as medical advice or even product-buying help, consult established, trusted experts. You know that the Consumer Reports Web site (and the MacUser site, for that matter) will have solid, labs-based advice. But is HotWired's Dr. Weil credible? Well, a little research (online, of course) tells you that he has both an M.D. and solid cred in alternative medicine. He's also a Harvard Medical School graduate and is on the faculty at the University of Arizona.

For advice that's less crucial to your health and well-being, just look for people who seem to know what they're talking about, and remember that a title doesn't always imply wisdom or expertise: In the Reagan administration, *presidential advisor* sometimes meant astrologer.

For what it's worth, that's my advice.

Don't Know Jack About FAQs?

MacUser maintains a list of FAQs about the Internet, *MacUser* itself, and this column specifically. Send mail to faq@macuser.com. *MacUser*'s address on the World Wide Web is http://www.zdnet.com/macuser/. You can reach me at traveler@macuser.com.

ILLUSTRATION / SCOTT MENCHIN

"Its excellent features and fantastic reliability make FirstClass shine as the premier groupware application."

MACUSER, 01/95

"I can't stress how much a well-designed system like FirstClass, especially with its sophisticated conference features, can boost productivity over simple e-mail."

RAYMOND G.A. COTE, BYTE MAGAZINE

"FirstClass delivered excellent performance throughout our tests... we didn't have a single server crash or system error on the system we left running for well over three months, with daily logins from more than 100 users."

MACWEEK, 05/95

"A complete electronic mail, group conferencing, and database access package that provides sophisticated workgroup functionality in an easy-to-use graphical environment."

CANADIAN COMPUTER RESELLER

"FirstClass is a bargain for its e-mail strengths alone. Powerful communications tools make it even better. If your small workgroup needs to connect, communicate, and collaborate... check out SoftArc's FirstClass 3.0."

PC/COMPUTING, 02/96

"FirstClass crosses communication categories by integrating features usually found in three or more products. It offers easy administration and a wide range of useful functions, and has a mature, well-thought-out infrastructure."

WINDOWS MAGAZINE

"Perhaps the best client/server messaging implementation out there... an excellent product."

FERRIS MESSAGING ANALYZER

"We at A&M studios are thoroughly enjoying our FirstClass system, and in fact, business could not go on without it here."

A&M STUDIOS, LOS ANGELES

"FirstClass from SoftArc offers a refreshing alternative to the mantra of concerns about managing workgroup environments. It offers workgroup communication capabilities at a competitive price, with low system overhead."

WORKGROUP COMPUTING REPORT, PATRICIA SEYBOLD GROUP

THEY FORGOT HUMBLE.

"You've blown the socks off of our previous e-mail system and have brought a new era of intercommunication to our organization that has earned us a ton of praise and thanks."

CHALLENGER CENTER FOR SPACE SCIENCE EDUCATION

"FirstClass has an appealing price, is extremely easy to install, and requires a near-zero learning effort. FirstClass should definitely be considered in procurement evaluation plans of organizations with simple groupware needs."

THE MESSAGING TECHNOLOGY REPORT, THE RADICATI GROUP, VOLUME 5, NUMBER 1

"FirstClass blends conferencing and mail together under a remarkably clean interface that goes far beyond the capabilities of most mail systems."

RAYMOND G.A. COTE, BYTE MAGAZINE

"Analysts and users applaud FirstClass for its ease of installation, administration, and its low cost."

INFORMATION WEEK

"What makes FirstClass so attractive is the fact that using it simply creates another desktop on top of your own computer desktop. It is a familiar world of files, folders, click and double click. It is graphical, straightforward, and intuitive."

TIMES EDUCATIONAL SUPPLEMENT, SCOTTISH EDITION

"SoftArc's FirstClass is an excellent product, with many features that are very attractive to both users and support staff. FirstClass deserves success in large organizations. The new FirstClass Server for Windows should be a big help in this regard; previously you needed a Mac-based server, which doesn't work for many user departments. FirstClass is a system worthy of evaluation for corporate-wide, diverse communication needs."

DAVID FERRIS, FERRIS RESEARCH E-MAIL ANALYST FIRM

"We are using FirstClass at the Prime Minister's office. After that, other institutions have been inspired. In just a few months, thousands of FirstClass copies were spread over the country."

CARL BILDT, FORMER PRIME MINISTER OF SWEDEN

"FirstClass is an excellent product. Its reliability astounds me. We have had no end of trouble with our QuickMail system, yet FirstClass never misses a beat–and we have it running on an old spare 128 upgraded to a Plus, with only 1 MB of RAM. I would thoroughly recommend it to anyone."

ADVANCED COMMUNICATIONS, NELSON, NEW ZEALAND

"Our experience with [FirstClass] has been great. FirstClass has provided reliable e-mail, gateways between our Canada-wide offices, an Internet gateway, and a newly installed fax gateway. It also does group conferencing and replication of text databases and discussions... no consultants to get us up and running; we figured this one out ourselves."

DOUG ALDER, EDITOR, THE COMPUTER PAPER

"FirstClass does everything. Not only does its implementation of e-mail include all the features you could want, it also offers conferencing and bulletin board facilities. The software is comprehensive and flexible enough to expand to most organizations' needs."

MACUSER UK

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JACK RANIERI, TSB INTERNATIONAL

"I just wanted you to know how pleased we are with FirstClass. Your system meets all of the requirements my users had. It seems to have been made for them and has good response times. I congratulate your company on a job well done and I look forward to using FirstClass for a long time."

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CIRCLE **121** ON READER SERVICE CARD

The 1996 MacUser Shareware Awards

HONORING THE 30 BEST MAC SHAREWARE PRODUCTS OF THE YEAR.

Shareware is still one of the best bargains in the software industry — quality programs you can download quickly and use immediately but pay for later (or not pay for at all if you get freeware). *MacUser* honors the creators of this year's best shareware with the annual *MacUser* Shareware Awards.

You can download any of this year's nominees or award winners from commercial online services, such as CompuServe or America Online, or from the Internet. The entire collection is available on *MacUser*'s online service (see How to Reach Us for access information). Those who don't have online accounts can get shareware from a friend who does or from a local Mac user group.

By Gregory Wasson

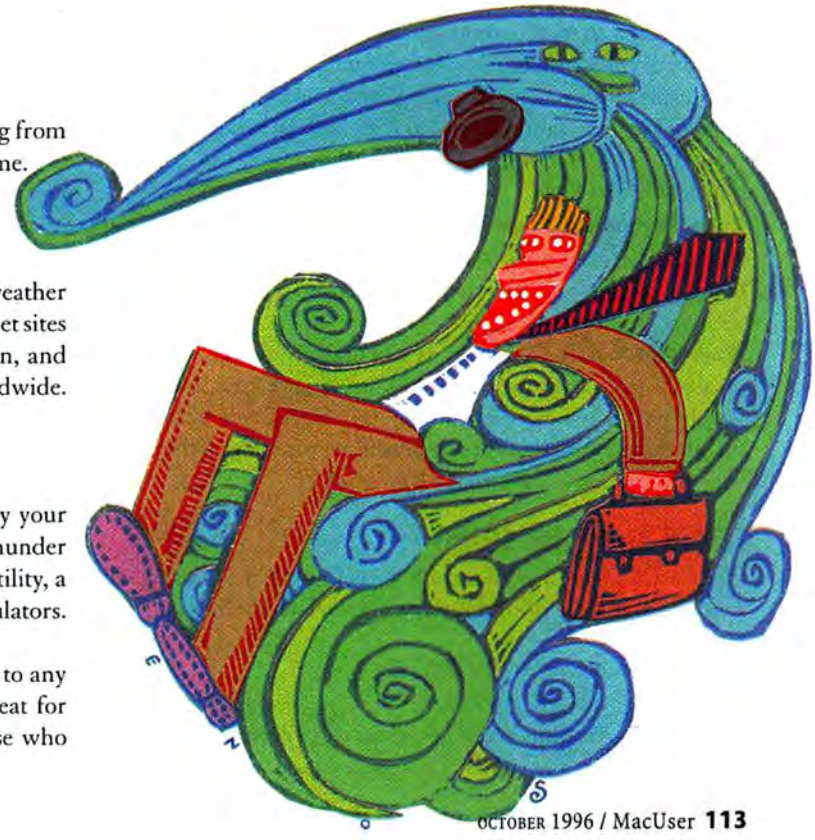


ILLUSTRATION / RANDALL ENOS

BUSINESS AND PRODUCTIVITY

This trio of organizers lends a hand for specialties ranging from preparing for business travel to keeping track of your time.

The Winner Is . . .

MacWeather

Whether you're traveling for business or pleasure, this weather program will help you get ready. It polls numerous Internet sites for you, assuming that you have an Internet connection, and retrieves the weather conditions of hundreds of cities worldwide. Chris Kidwell; $10.

Honorable Mentions

The Disktools Collection. To help you manage not only your day's work but also your Mac's desktop, the author of Thunder 7 put together a suite of five DAs: a file-management utility, a roomy notepad, an appointment calendar, and two calculators. Evan Gross; $20.

TimeSlice. You can keep track of time and costs related to any project by using this professional-looking software. Great for freelance design artists, technical writers, or anyone else who bills by the hour. Maui Software; $40.

UTILITIES

For a thoroughly modern Mac interface, one that's more useful, strap these utilities onto your hard disk.

The Winner Is . . .

CopyPaste

One Clipboard just isn't enough if you want to save more than one copied item easily. CopyPaste adds ten Clipboards to the Edit menu. Saving and retrieving your copied items is as simple as typing in the right number as you copy and paste. Peter Hoerster; $20.

Honorable Mentions

Aaron. With this extension, you can at least *look* like you're on the cutting edge. It brings the basic look and feel of the postponed Copland operating system to your Mac today. Greg Landweber and Edward Voas; $10.

ShrinkWrap. This second-time honorable-mention winner is now PowerPC-native and still does its magic as a replacement for Apple's Disk Copy program. Chad Magendanz; $20.

EDUCATION AND REFERENCE

Pump up those brain cells with these three educational barbells.

The Winner Is . . .

Smart Move

Unlike many shareware quiz games that are all-text, this game is colorful and contains interesting graphics (such as maps). Up to four players can compete, using their knowledge of U.S. geography, such as naming state capitals. Ron Whatley; $15.

Honorable Mentions

HyperElements. Just about everything you could want to know about the periodic table of elements — from an element's symbol to its mass — is contained in this HyperCard stack. Nicholas Marc Billon; free.

MacVerter Metric. It's as easy as π to make conversions of such measurements as temperature, volume, length, area, and mass/weight with this measurement-conversion program. The colorful interface is remarkably noncomplex, considering all the number-crunching going on. Doug Bradley; $15.

FONTS AND PUBLISHING

Fonts are like Godiva chocolates — you just have to have one more — as is clear from this year's font-related nominees.

The Winner Is . . .

Font Box

To simplify keeping track of fonts, this freeware program quickly searches your system for duplicate fonts, orphaned fonts, ID conflicts, and font-file corruption. Insider Software; free.

Honorable Mentions

Dungeoneer Font. Making maps for dungeons-and-dragons-type games is just what this font (available in both TrueType and PostScript) is meant for. Instead of being letters, its characters are images that comprise a map, such as pathways, doorways, and portions of walls. Donald Synstelien; $10.

Jean Camil TrueType Font. The delicate letterforms of this TrueType font create an antique look. Unlike some other free fonts, this one has a full character set and four faces: regular, bold, italic, and bold italic. Jean Bertrand; free.

GRAPHICS AND MULTIMEDIA

This year's contenders help make your productions picture-perfect, whether you're showing off on the Web, in your company, or in the privacy of your own home.

The Winner Is . . .

GifBuilder

Have you ever wondered how to create those delightful animated GIF images cropping up all over the World Wide Web? This scriptable utility lets you do just that quickly and easily, so you don't have to bother with Java programming or CGI animation scripts for simple images. Yves Piguet; free.

Honorable Mentions

FC Text-Picture. Never let plain-text documents be plain again. You can add PICT graphics to text-only documents if you convert the graphics first, using this clever applet. Ammon Skidmore; free.

MediaLink. Here's a low-cost substitute for PowerPoint or HyperCard. This presentation-authoring software lets you import resources, such as sound files and QuickTime movies, into your electronic slides and then make links among slides for complete presentations. InterEd; free.

INTERNET

Learning the nuts and bolts of connecting to the Internet is a must if you want to be part of the wired generation. This techie trio will get you plugged in faster than you can say "ISDN."

The Winner Is . . .

Fetch

You can send and receive files from network hosts that support the TCP/IP FTP (file-transfer protocol) if you have this FTP client software for the Mac. Impressive interface improvements

make this 1994 *MacUser* Shareware Awards honorable-mention recipient a winner this year. Dartmouth College; $25.

Honorable Mentions

NetPresenz. If you need your Mac to act as an FTP server, try out this handy program, formerly known as FTPd. Peter N. Lewis; $10.

NonSequitur. Thanks to this gem, you can use a Mac rather than a UNIX machine or a PC as your Internet *nameserver* (a server crucial for making Internet connections). Glenn Anderson and Stephan Somogyi; free.

NETWORKING AND TELECOM

Lily Tomlin's Ernestine had the right touch, but these three telecommunications programs would put her to shame if you needed to reach out and touch someone with your Mac.

The Winner Is . . .

FreePPP

This must-have program makes connecting to the Internet easy. It uses the Point-to-Point Protocol (PPP) to make TCP/IP available over a telephone line (so you don't have to mess with the usual network connections). FreePPP Group; free.

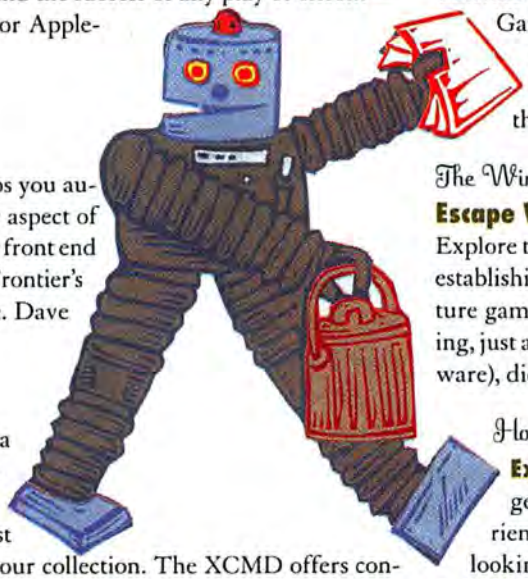
Honorable Mentions

Black Night. This terminal-emulation program is ideal for telecom novices. It has extensive online support, an intuitive Mac-style interface, and an automated setup procedure. Christopher Swan; $30.

ZTerm. It's refreshing to find a fast, efficient telecommunications program that's not overloaded with features. It doesn't have a splashy interface, but it's a longtime shareware favorite. David P. Alverson; $30.

SCRIPTING AND DEVELOPMENT

Good scripting lies behind the success of any play or sitcom — and HyperCard stacks or AppleScript applets.



The Winner Is . . .

Frontier

This powerful tool helps you automate just about every aspect of your Mac. The scripting front end can use AppleScript or Frontier's own scripting language. Dave Winer; free.

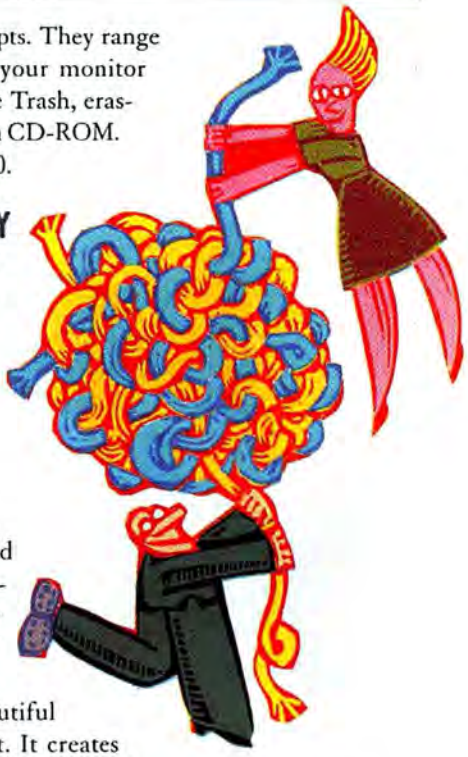
Honorable Mentions

Fade XCMD. To add a fading-screen effect to any HyperCard (version 2 or later) stack, just put this software into your collection. The XCMD offers control over the timing and intensity of the fade. Gilles Kuntz; free.

finderScripts 3. Reap the benefits of AppleScript automation without writing a single script, by downloading this collection of 47 AppleScript scripts. They range from letting you set your monitor depth to emptying the Trash, erasing a disk, or ejecting a CD-ROM. John Paul Du bois; $10.

HOME AND HOBBY

Shareware's specialty is specializing. Each of these programs aims at a specific interest and does it with gusto.



The Winner Is . . .

Knot

If you think you could enhance some documents with a few handsome knots or if you're simply interested in seeing a beautiful craft, check out Knot. It creates 3-D knots — for which you set the shape, color, and lighting — and lets you save them as a TIFF graphic or an animation. Lloyd Burchill; $20.

Honorable Mentions

Gene. This genealogy database turns information from even the largest and most convoluted family structures into graphical trees and charts. Diana and David Eppstein; $15.

U.S. Stamp Pro. Catalog your U.S. postage stamps with this FileMaker Pro template. The easy-to-use interface makes data entry a snap. Clyde E. Bowman III; $25.

GAMES

Games have always had the distinction of being the most popular form of shareware, dating back to the early days of ASCII Star Trek and continuing today with this year's winners.

The Winner Is . . .

Escape Velocity

Explore the galaxy, fight off enemies, and make your fortune by establishing trade routes in this engaging science-fiction adventure game. This game pushes the envelope of shareware gaming, just as Maelstrom, from the same publisher (Ambrosia Software), did in its day. Matt Burch; $20.

Honorable Mentions

Exile II. Lead a party of adventurers through towns, dungeons, and countryside, accumulating wealth and experience in this fantasy role-playing game. It has realistic-looking graphics and colorful screens. Jeff Vogel; $25.

Grizzly. Kung fu meets a not-so-gentle Ben in this combat game, similar to many you've seen in video-game arcades. Adam Winiecki; $15.

Are you backing up or going nowhere?

You have good intentions. You drag your important files to a disk or server. But just imagine you need to restore everything right now. Ouch! Reassembling your hard disk would be like trying to put together the VCR your five-year old took apart.

To save time and space, we back up only what's new and different.

1. *Dragging makes backing up a real pain.* There's just too much to remember. Which files did you change? What's new? When did you back up last?

Ever try to restore an important file that's been dragged to a mountain of floppies? Good luck.

Retrospect® is the better way. It always knows when to back up and what's changed. And it's fast, automated, and painless. You can find a file in seconds. Or restore an entire hard disk in minutes – same as it ever was.

2. *Backing up the right way is actually faster and easier.* Retrospect gives you complete backup that saves time and backup media. Not to mention frustration.

3. *It's not a matter of if disaster strikes. It's when.* It'll happen to half of you this year. Fires, five-year olds, disk failures, a slip of a finger. Retrospect is simply your best insurance policy. Don't wait until it's after the fact to discover that the other guys' recovery tools won't bring back what's gone.

4. *Retrospect teams up with tape or cartridges.* It's no wonder Retrospect's bundled with just about every Macintosh tape drive sold. It's no slouch with SyQuest, MO, or Zip drives either – put them together with Retrospect and you've got a powerful backup machine.

Nothing's as faithful as Retrospect. We even back up your preferences. So if disaster strikes you won't roll over and play dead.

5. *All backup software's not the same.* Retrospect's the most trusted and recommended backup software in the business. It has the awards. The reviews. The customers. Plus key features those other programs don't have – compression, encryption, comprehensive scheduling, and support for practically every SCSI drive in the universe.

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You want more proof? Give us a call: 800-95-BACKUP. We'll fax back 10 more reasons Retrospect's the best way to save your data. Your work is worth it.

Retrospect

dantz *To go forward, you must backup.*

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By Bob LeVitus and Christopher Breen

Help Folder

Sticking to the menu, the sound of System 7.5.3, and cache value.

Windows on the Menu

Q. I have to admit there's one Windows feature I like: When you click on a menu on the menu bar, the menu stays down until you make your choice. Do you know of an extension or control panel that gives the Mac OS this capability?

Gilbert Breen
via the Internet

BOB: Gilbert *Breen?* Any relation to our beloved Chris?

CHRIS: A relative of mine envious of a Windows feature!? Hardly . . . .

BOB: Well, Mr. Breen, Now Menus has been doing that little trick for years. You can configure it so that a single click displays any menu until you either choose an item or click outside the menu. There's even a variation that pops down the menu when the cursor passes over its name on the menu bar. No clicking required.

CHRIS: Or you can go the freeware route (you besmircher of the family name) and snag a copy of Drop Menus, by Richard Outerbridge. It's exactly what you're looking for, and it's free. I quote from the immortal Read Me file:

"Drop Menus is an attempt to bring the functionality of MS-DOS-like drop-menus to the Macintosh environment, without giving up the Mac's drag menus. Just clicking in the menu bar will cause the menus to drop until another click is made."

BOB: Come on, he's really your cousin, right?

CHRIS: There was a completely unrelated splinter group of Breens who attended the Donner festivities in the Sierras a few generations back. Cold and deprivation must have tainted the gene pool.

I Wanna Make Some Noise

Q. I just installed System 7.5 Update 2.0, but I can no longer record sounds with my Mac, because the Sound control panel is gone. The Monitors & Sound control panel that replaced it is cool, but it doesn't let me record sounds. Can you offer any wisdom?

Rose Welch
via the Internet

CHRIS: Rose, you cutting-edge thing, you. From your question, we know that you have a PCI-based Power Mac — the Monitors & Sound control panel isn't compatible with other Macs. Those folks with older Macs and System 7.5.3 will find their tried-and-true Sound control panel snug as a bug in the Control Panels folder, same as always.

But because you are so with-it, the recording capabilities of the old Sound control panel are now kaputski under M&S. To record sound with a PCI Power Mac, you have to launch the new SimpleSound DA instead. Just look on the Apple menu, and you will find a familiar interface (see figure 1).

BOB: Why was all that functionality moved from the Sound control panel to a new DA? We have no idea.

CHRIS: But if it bothers you, there are at least two great freeware sound recorders floating about. SoundBuilder 2.0.2, by Kenneth W. Arthur, records, edits, and saves sounds in SND, AIFF, AIFC, WAV, and VOC files as well as in its own native format and supports stereo, compression, asynchronous recording and playback, markers, and much more.

BOB: Or check out SoundMachine 2.1, freeware by Rod Kennedy, which lets you play and record SND/AU (mu-law, A-law, and linear) and AIFF/AIFC (MACE3 and MACE6) sound files. You can also change speed, play backward, loop sounds, switch formats, and the like, with no restriction on file size, and all playing can take place in the background. SoundMachine is my sound helper application for Netscape Navigator.

Confused About Cache

Q. I'm not sure how to manage my cache: There's a control panel on my Mac called Cache Switch, with buttons that say Faster

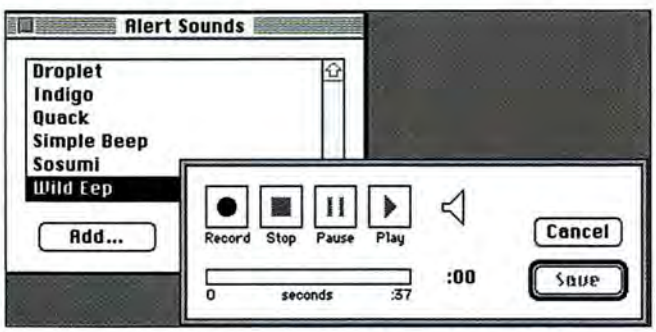


figure 1 / Look familiar? It's not the Sound control panel! It's the new SimpleSound DA, used to record beep sounds under System 7.5.3.

WRITE TO HELP FOLDER/TIPS

c/o *MacUser*
950 Tower Lane, 18th Floor
Foster City, CA 94404

Don't want to wait for an answer? Post your question on the MacUser Forum on either America Online or CompuServe, or send e-mail to helpfolder@macuser.com or tips@macuser.com. We pay $25 to $100 for any undocumented tips we publish.

ILLUSTRATION / BOB STAAKE

Tips / Online

Quick Cache

I've found a way to speed up Web access on my vintage Mac. I use Netscape Navigator all day on my IIcx, and it can be frustrating watching my old Mac struggle to load cached files from the hard disk. Then I remembered AppDisk, Mark Adams' cool RAM-disk application that — unlike Apple's RAM disk — works even on vintage Macs such as mine.

To speed up the loading of cached Navigator pages, I create a 2-MB cache with AppDisk. I then open Navigator and specify that cached files go to my RAM disk. (Select Network Preferences from the Options menu. Click on the Cache tab, click on the Browse button, and then find the RAM disk.) Now, when Navigator needs a cached file, the file quickly loads from the RAM disk.

Note: Be sure to start AppDisk before Navigator (you can have it open automatically by placing it in your Startup Items folder) and have AppDisk save its contents to your hard disk so that the cache will still be there upon restart.

Greg Gabelmann
via the Internet

End of the eWorld

Before you former eWorld subscribers deep-six your eWorld folder, remember that you can transfer all the hot lists you created in eWorld right into AOL, just by copying them into your AOL folder. Why tread the same path again?

Robert Spage
via AOL

(Cache Enabled) and More Compatible (Cache Disabled). Which is best, and where can I set my cache level?

Dave Jonasen
via the Internet

BOB: These are actually two very separate questions. The Cache Switch is a control panel applicable only to Macs with 68040 processors (most Centris and Quadra systems and many Performas). It enables or disables the 68040's onboard cache.

The "cache level" you mention is the disk cache, found in the Memory control panel, a whole different kettle of fish.

CHRIS: You should set the Cache Switch to Faster unless or until any of your programs bomb or freeze when you launch them. If you do experience bombs or freezes, set the switch to More Compatible, restart your Mac, and try again to launch the program. That switch was extremely useful when the 68040s first came on the scene and then-current software wasn't quite sure what to make of the new processor, but software written in the last few years should merrily skip and fling daisies in Faster mode.

BOB: Now for the Memory control panel's disk cache:

If you have only 5 MB of RAM, I'd recommend that you set it as low as it goes, 32K. Or maybe 64K, so you get a little pick-me-up (it speeds up disk access a little).

Here's the deal: Every K you assign to the disk cache in the Memory control panel adds 1K to the amount of RAM your system software grabs at startup. Bump the disk cache up to 128K, and your system software uses 96K more RAM, leaving 96K less RAM available to your applications (128K minus the 32K minimum).

CHRIS: By the way, Dave, RAM prices have never been lower. You can probably upgrade to 8 MB for well under $100.

Scrambled Startup Screen

Q. My custom color startup screen appears in black-and-white and is kind of dotty since I zapped my PRAM. I've resaved the original image in Photoshop, and I've tried loading different startup images. Nothing works. How do I fix this?

Joe Pike
via AOL

BOB: I love it when we get a question about something that just happened to *me*. I know how to fix this puppy for sure. Follow these simple instructions, and your startup screen will be restored to living color before you even know it.

First, open your Monitors control panel. Change the color depth to anything but the current setting, close and reopen the control panel, and return the color depth to the original setting. Restart, and see your startup screen in all its colorful glory.

SCSI Woozy

Q. SCSI-2, Fast SCSI, Wide SCSI . . . . All these terms make my brain hurt! Can you please explain what this alphabet soup means?

Howard S. Swan
via the Internet

CHRIS: Howard, you don't know brain hurt until you've read all 600 pages of the current SCSI specification.

BOB: And I suppose *you've* read it?

CHRIS: Maybe I have; maybe I haven't. I'm bucking for a long-overdue raise, and if implying that I've read this dreadfully long and complex tome will help my cause with the Large Cheese, I'll imply like it's going out of style. While I'm otherwise occupied boning up on my nonarbitrating systems and nonextended-sense data options, why don't you start, Bob?

BOB: *SCSI* stands for *Small Computer System Interface* and is a specification proposed in 1985 . . .

CHRIS: Don't forget the X3T9.2 Task Group.

BOB: Man, you must really want that raise. Fine . . . proposed in 1985 by a collection of people known as the X3T9.2 Task Group. The members of this group, along with some hardware manufacturers, came up with a set of hardware and software standards for moving data from one computer device to another in parallel (meaning that data bits move side by side rather than in single file).

CHRIS: Not content to stop with the SCSI-1 standard, which was adopted in short order by Apple and other vendors, the group pushed on to SCSI-2, an enhanced standard that is compatible with SCSI-1. It incorporates new specifications for devices such as scanners as well as CD-ROM, tape, and magneto-optical drives, and it offers faster transfer of data. Fast SCSI and Wide SCSI are faster iterations of the same standard.

BOB: Why should we care about this, Chris?

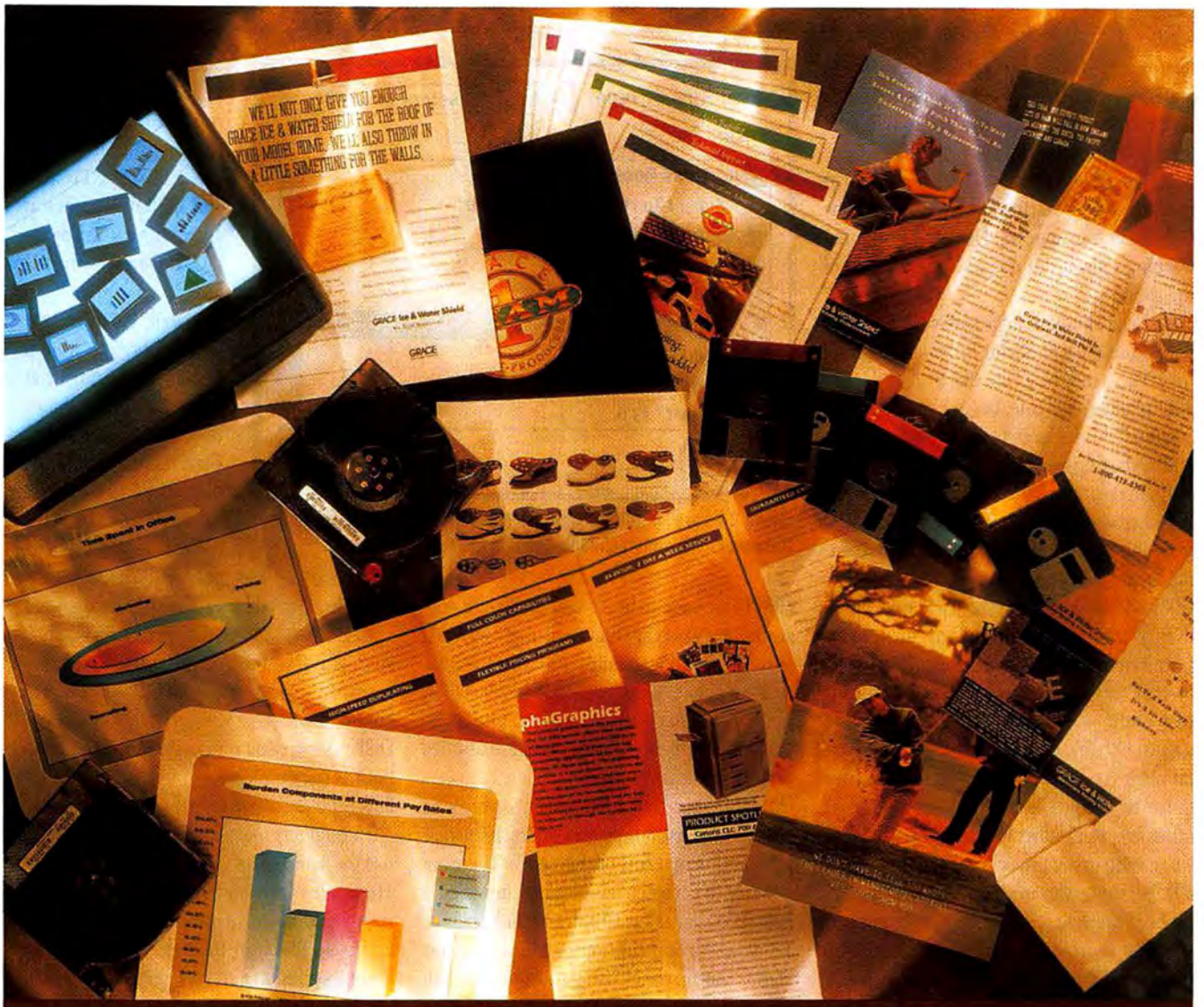
CHRIS: Here's the deal: All the SCSIs are standards for moving data and for the hardware that accomplishes this task. Most SCSI peripherals you buy today measure up to SCSI-2 standards, although most Macs are still wallowing in the SCSI-1 standard. You can use a SCSI-2-compatible drive with an older Mac, but you'll be moving data at SCSI-1 speeds. PCI Macs — such as the Power Mac 7500, 8500, and 9500 and some clones — include internal SCSI-2 buses. Their external SCSI buses still use the older SCSI standard and therefore move data at the slower rate. For this reason, disk drives you add internally (assuming your Mac has an internal drive bay available) may be a bit faster than external ones. The Network Servers are the first Apple computers to surpass SCSI-2: Each model has two built-in Fast-and-Wide-SCSI buses.

Startup Interruptus

Q. It seems I've picked up some problem software — probably something I downloaded. It produces a warning that pops up after the extensions load but before my Mac is released to the Finder. Any ideas?

Todd Jespersen
via AOL

CHRIS: Even though we don't know what that pesky error message says, let's take a stab at your problem anyway. Todd, we can pretty much guarantee that the problem is linked to



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CIRCLE **39** ON READER SERVICE CARD

one of three things: an extension, a control panel, or an application being launched automatically at startup (from an alias in the Startup Items folder).

BOB: Here's how to test our theory: Hold down the Shift key at startup until the Extensions Off dialog box appears. Does the unwanted warning show up? If not, it's definitely one of the above.

CHRIS: And although we're sure you've already done so, read the annoying little warning carefully. There may be a clue there.

BOB: If there's no clue, begin by moving the Startup Items folder out of your System Folder and restarting your Mac. If that fixes it, the culprit is one of the applications being launched at startup. Remove it (or its alias) from the Startup Items folder before returning the folder to its proper place.

CHRIS: If that doesn't do the trick, you can either go through the hoary "find the recalcitrant extension or control panel" dance, using System 7.5's Extensions Manager, or take the easy route — download the Conflict Catcher demo (http://205.179.133.2/C&G/demo.html). It's good for 72 hours — plenty of time to isolate the problem and to experience the other joys of Conflict Catcher, whose praises we've sung many times in these pages.

BOB: For those who aren't familiar with the traditional method, here goes: Use Extensions Manager to disable all extensions and control panels, and then restart your Mac. Turn on half of your extensions and control panels in Extensions Manager. Restart your Mac yet again.

CHRIS: Whether or not the warning dialog box appears, you now know which half of your extensions and control panels contains the suspect. Now take the suspect group and disable half of the items.

BOB: Through the miracle of halving (and holding), you'll soon expose the culprit. Once you've identified the obnoxious little bugger, drag it to the Trash and restart one last time to be rid of it forever.

Bring in the Substitute

Q. Is there a way I can use an application other than SimpleText to open text and PICT documents automatically when I double-click on them?

Gary Harrod
via the Internet

CHRIS: Yes indeedy, but unless some intrepid shareware author has stepped to the fore in the last few weeks, you're going to have to pay one company or another for the privilege.

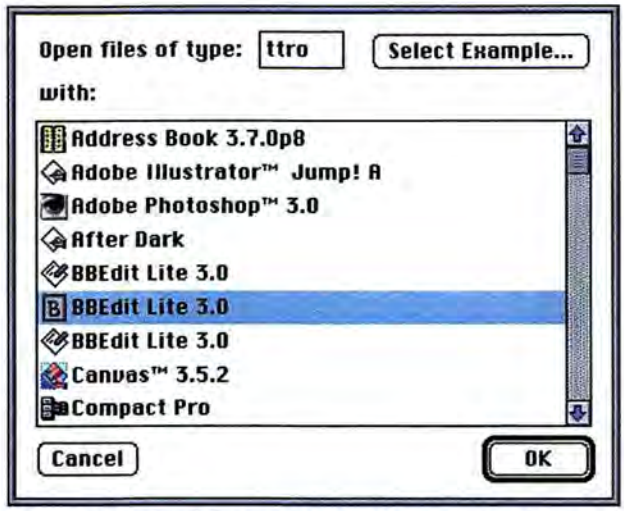

figure 2 / Lose SimpleText and TeachText forever by using Desktop Makeover's Document Linking function instead.

BOB: There used to be several shareware programs that were capable of opening and reading orphaned documents (you know, files created by applications you don't have). When Apple came out with System 7.5 and Macintosh Easy Open, the need for these utilities pretty much disappeared.

CHRIS: But regrettably, users such as you, who prefer not to use SimpleText or TeachText, are left wanting in terms of shareware. There are a couple of commercial solutions, however.

BOB: If you have Now Utilities 5.0 or later, take a look at the Substitution option in the Now Menus control panel. Using substitutions, you can direct your TeachText and SimpleText documents to be opened by the text-savvy application of your choice.

CHRIS: The Desktop Makeover component of Aladdin's Desktop Tools (see figure 2) offers the same kind of service, with an added bonus. Unlike Now's Substitution feature, Desktop Makeover enables you to open not only the standard text documents created by TeachText and SimpleText but also those locked text documents that look like tiny newspapers. I've directed Desktop Makeover to use BareBones' BBEdit whenever I open a TeachText or SimpleText file.

Traitor, or Simply Misinformed?

Q. I'm planning to buy a new computer, and although I'd like to get a Mac, I need to work with a PC-using colleague via e-mail. Am I foolish to stick with the Mac? I can go PC just as easily.

Dick Marciano
via the Internet

CHRIS: Dick, I want you to remember those fateful words "I can go PC just as easily" in case you wind up frantically rummaging about inside a PC's CONFIG.SYS and AUTOEXEC files at 4 A.M. with a 9 A.M. deadline staring you in the face.

Listen, I realize that it sounds like abject boosterism (and what better place for it than a magazine entitled *MacUser?*), but the truth is that all PCs — even if they're running Windows 95 — are a serious pain in the keister.

BOB: There's a bit of unbiased testimony!

Regardless of the validity of Chris' claim, it sounds as if you will easily be able to collaborate with your colleague in a cross-platform environment.

CHRIS: Or perhaps your colleague could be so bold as to buy a Mac.

BOB: Simmer down, lad.

I would just make sure that the two of you use the same cross-platform applications — Microsoft Word, WordPerfect, whatever; save your work in a format readable by the other; and swap files over the Net. If you deal with graphics files, again, save them in a format the other platform understands, and you'll be all set.

CHRIS: If you're going to be sending large files across the Net, you'll also want to think about file compression. Most PCs use the zip (not to be confused with the Zip drive) format, and you should too.

There are several Mac-to-zip utilities available online. I happen to use Tommy Brown's $10 shareware program ZipIt, because it works.

BOB: One additional hint: When sending zipped Mac files to a non-Macintosh, make sure you turn MacBinary off. Files saved as MacBinary cannot be read by other kinds of computers.

Breakin' Up Ain't Hard to Do

Q. Is there a program that can split a compressed file into parts? I have a file on my hard disk that is too big to fit on a floppy. I would like to split it into 1.4- or 1.3-MB parts.

Jim Silverknight
via the Internet

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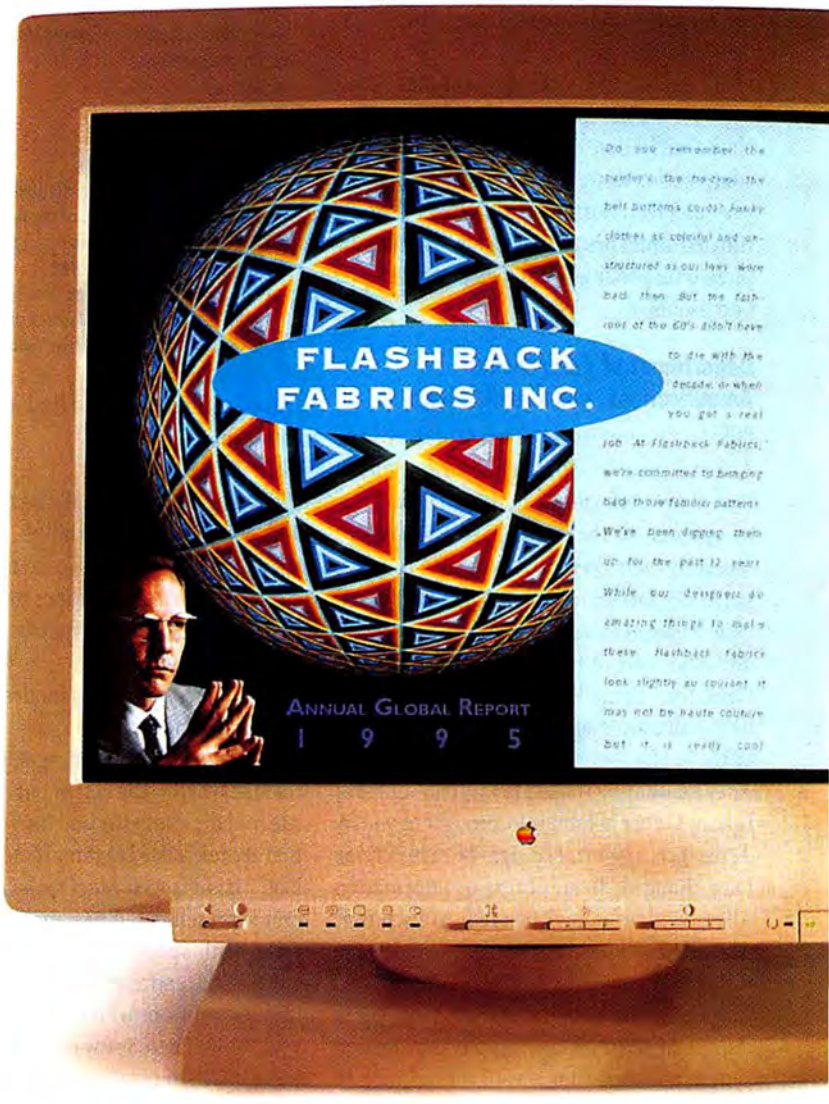

YOU'VE GOT TO SEE IT IN EPSON COLOR.

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BOB: Four outstanding products come to mind, one shareware and three commercial.

CHRIS: Bill Goodman's splendid $25 shareware offering Compact Pro can both compress and segment files. It's now PowerPC-native, so it's as zippy as a pinhead.

BOB: I agree that Compact Pro rocks, and I've been a registered owner and user for years. But I sometimes require a more full-featured suite of programs — with stuff such as full Finder integration, on-the-fly compression, encoding and decoding of all popular compression schemes, Internet access, binary formats such as the aforementioned zip, and more. So I often turn to the ubiquitous industry standard, StuffIt Deluxe. If you need the power, flexibility, and multiplatform/multiple-file-format support, it's well worth the $70 estimated street price.

CHRIS: And to round out the field, Now Utilities sports a compression component called Now QuickFiler, which offers background compression as well as the ability to segment your archives. Norton's DiskDoubler Pro (estimated street price, $75) has the same compression capabilities, plus it includes the zippy CopyDoubler.

Department of Corrections, Amplifications, and Clarifications

BOB: In the April issue, we wrote of "Performa Anxiety" (page 117) but neglected to point out that many Performas use the 68LC040 chip, as opposed to the full-fledged 68040 chips found in their Quadra and Centris counterparts. The former lacks a math coprocessor. If your business involves graphics, statistics, or any other sort of heavy mathematical functions, then many Performa models may not be suitable after all.

CHRIS: In May we plugged Apple's Information Alley mailing list (page 119), a great source of tips and other helpful info, brought to you by Apple tech support. The sign-up instructions have changed. To subscribe to Information Alley, send an e-mail message to listproc@whoville.austin.apple.com and include only the words *subscribe infoalley <Your Real Name>* in the body of the message. Upon receipt of the message, Apple's automated system will start your e-mail subscription to Information Alley.

Finding Find Pro

Q. In your May issue, you recommend a program called Find Pro, but I have been unable to locate the program on the Internet. Can you tell me where to find it?

William Davis
via the Internet

CHRIS: The truth can finally be told!

BOB: Let the trumpets trump!

CHRIS: And the angels descend from the heavens! Bitchin' *MacUser* utilities such as Find Pro III and Bill Gates Does Windows are now available to one and all.

BOB: Provided you have a modem or a TCP/IP connection, of course.

CHRIS: Those sharp-eyed readers will notice that the blurb at the end of our column ("You can find the shareware and freeware programs that are referenced in this article at blah, blah, blah") has changed. *MacUser* has expanded its online presence and now makes available — along with several troughfuls of other cool stuff — the entire suite of exclusive *MacUser* utilities to anyone with Web access. Just swivel your browser to Software Central at http://www.zdnet.com/macuser/software/ and let the downloading begin.

BOB: I also understand that *MacUser* is now open for business on AOL. Rumor has it that my partner in crime has donned the Chief Sysop hat.

CHRIS: I have indeed. America Onliners are most welcome to type the keyword MACUSER and grab as many new and old software goodies as their hard drives and wallets will allow. And while you're there, please feel free to drop a public note complaining about the pandering nature of this answer. I'm pushing to create an area on the forum where visitors are able to squabble and complain to their hearts' content.

BOB: Since we're in the pandering mood: As Chief Sysop Emeritus of CompuServe's *MacUser* forum, I'd be remiss in not reminding readers that CIS' ZD Net/Mac services are just as outstanding as ever. Check out the *MacUser* forum, and say "hi" to Sysop Joe Holmes and the rest of the top-notch online crew.

Bob LeVitus is the author of 20 computer books and is a columnist for the Houston Chronicle. *Christopher Breen recently coauthored* The Macintosh Bible Guide to Games, *published by Peachpit Press.*

Tips / Font Samples

Word 6

A great underdocumented feature — it's buried somewhere in online help — of Word 6 is the FontSampleGenerator macro. It generates a complete or partial sample of all the printable fonts in your system.

To find the FontSampleGenerator macro, issue the Open command and navigate to the Macros folder, within your Microsoft Word 6 hierarchy. Open the Word 6.0 Macros file. Now choose Macro from the Tools menu and select FontSampleGenerator from the list of macros. Select the point size and the kind of sample you'd like: All (for every font character) or Sample (for only the most common characters).

Brad West
via the Internet

Previewing theTypeBook

The shareware version of theTypeBook is a great utility for printing samples of the fonts in your system, but it lacks one thing — a print-preview function. Here's a workaround:

Download one of the Hewlett-Packard DeskWriter drivers from the usual places. After installing the DeskWriter driver (you don't actually need a DeskWriter printer), select DeskWriter in the Chooser. Now open theTypeBook and select the fonts you'd like to view. Issue the Print command. When the Print dialog box for the DeskWriter appears, click on the Preview button. You can now see your fonts on-screen with the option of viewing them at three zoom levels (see figure). Unfortunately, you can view only one page per Print command, so don't bother choosing more than one font per preview.

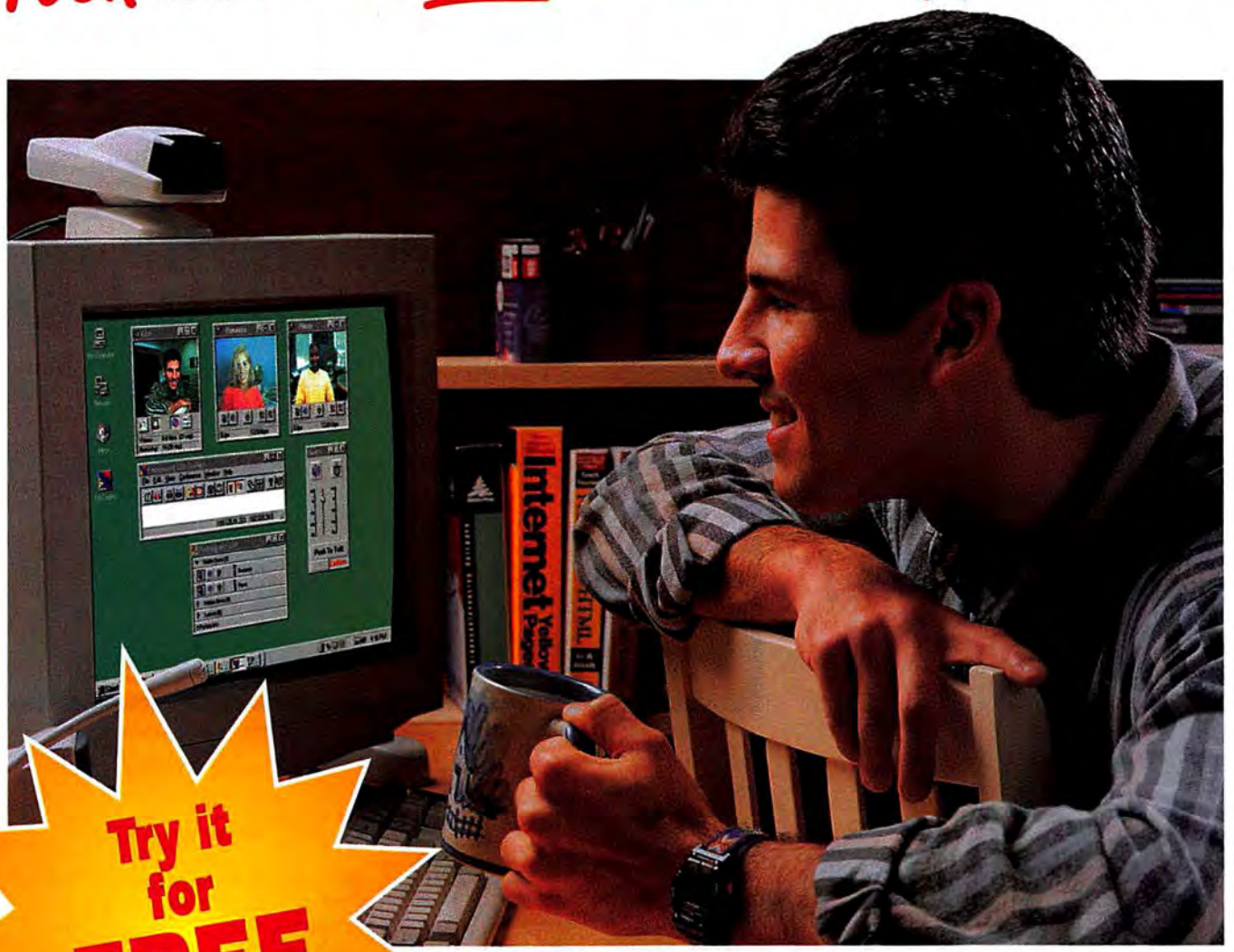
This trick works with any program that lacks a print-preview function.

Steve Cavanaugh
via the Internet

You can find the shareware and freeware programs that are referenced in this article at *MacUser's* Software Central (http://www.zdnet.com/macuser/software/). You can also find them in the MacUser areas on CompuServe (GO ZMC:MACUSER) and America Online (keyword: MACUSER).

Some call it Internet Videoconferencing...

Ken likes to See "What's Happening."



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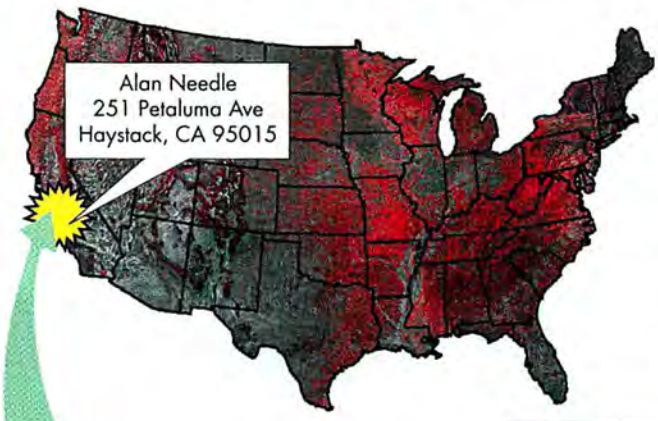

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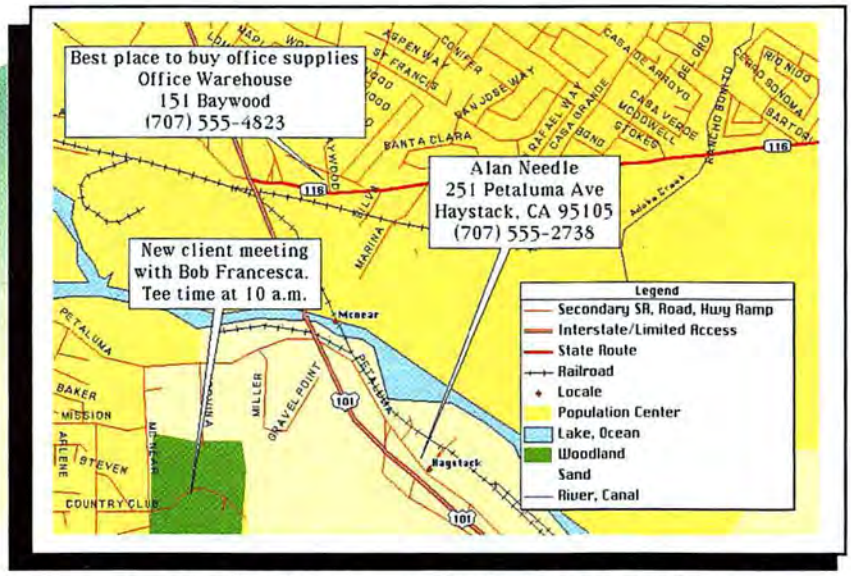

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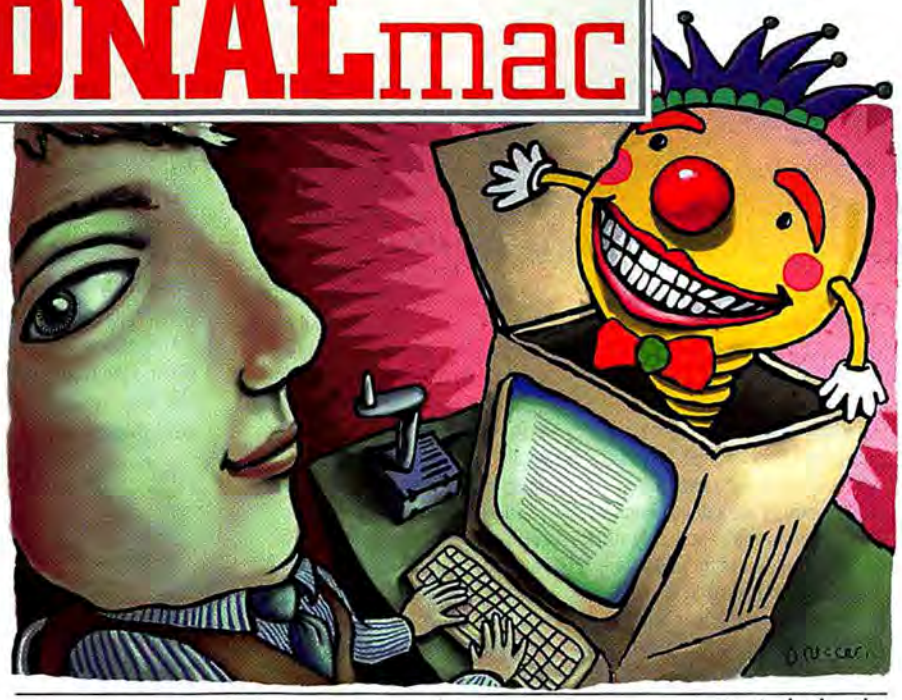


Arise, downtrodden temporary workers of the world, and arm yourself with Andy's sanity-saving arsenal of software tools.

By Andy Ihnatko

The Temp's Guide to Wasting Time

YES, BROTHERS AND SISTERS, I've been there. You're trapped in your third temp assignment of the month, dressed in itchy businesswear in another unfamiliar, unventilated office doing work you don't want to do assigned by overlords you don't know and can't possibly respect. The one remaining dream the temp agency hasn't destroyed is the fantasy that somebody somewhere will raise the red banner of revolution and you can start displaying a few middle-management heads on pikes. But that probably won't happen anytime before noon. You'll just have to face the fact that you can't get lunch until you at least *appear* busy throughout the morning hours.

To help you accomplish such an onerous task, carry with you to each new gig this secret weapon: The Temp's Pocket Pak — a Zip cartridge loaded with the tools (listed in this handy article) that will help you survive the temp experience.

Till It's Time to Do Lunch

First, of course, come productivity tools — those truly essential applications that enhance your office productivity and let the company get the most out of you.

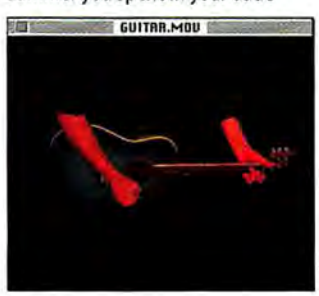
OK, we've all enjoyed a good laugh. Now, let me assure you that I know you aren't meant to be a data-entry clerk. No need to apologize for the button-down shirt and tie: I know full well that this office gig is just to pay the bills until you interest Spielberg and Katzenberg in your screenplay. But are you sure you'll be ready if you get the call? (Did I say "If?" I meant to say "When." Of *course*, I meant "When.") What if certain story elements have fallen out of date in the months since your final draft? It's for modern crises such as these that your Pocket Pak should contain two Screenplay Systems (800-847-8679 or 818-843-6557) writing programs — **Scriptor** (♦♦♦; $149 list), a screenplay text-formatting program that takes over much of the work of making your text fit into screenplay format, and **Writer's DreamKit** (♦♦♦; $149 list), which helps you come up with an award-winning plot and hone your script to razor sharpness.

Personal Service Bureau

Developing your writing isn't the only reason you signed up for office work, though; let's not discount the free access to Macs, laser printers, and copy machines. The next items on your magic cart should be graphics programs, such as Adobe PageMaker and Adobe Illustrator, that let you take advantage of all that hardware. They're simply indispensable, whether you're working on your *Mystery Science Theater 3000* 'zine or your sideline business designing résumés, business cards, and brochures.

For Your Exercise Break

A feeling of superiority over your coworkers, free printing, and paid postage for 400 copies of your thrash-metal-rock 'zine — you do get a lot out of office work. Nonetheless, there *are* drawbacks that make you nostalgic for the summer you spent in your dad's warehouse. There, you could crank up Pete Townshend and play air guitar all the live-long day. But oppressive standards of "professional" behavior make this impossible in the modern office. Fortunately, Apple is in the business of delivering tools to the proletariat. With QuickTime VR Player (available at http://qtvr.quicktime.apple.com/) and eVox Productions' **Guitar** — a virtual guitar you can play on-screen (free from the Samples section of eVox's Web site, at http://www.evox.com/) — you can emulate Pete in everything except his power windmills and 92-percent hearing loss.



Unobtrusive Entertainers

Well! It's been a taxing workday so far. Time to relax with some games. Gaming in the workplace presents some unique challenges. There are

ILLUSTRATION / DAVID RICCERI

insecure, middle-management types walking through the office at all hours of the morning and afternoon. It's entirely possible that either frenzied keyboard action or Marathon 2-ish music might slip below the notice of their 10-watt radar, but the two happening simultaneously are a dead giveaway. On top of that, you're probably stuck with a pitiful excuse for a Mac, one of those old models that shakes like an off-kilter washing machine whenever it has to do long division. This is clearly a mandate for quiet and low-tech gaming. Why not start with Ian Lynch Smith's shareware ▲ **Hearts Deluxe** (available at http://www.inch.com/~freevers/)? It's a genuinely addictive card game with animated computer opponents. These lively electronic foes can also help you develop the social skills you'll need for networking your way into a *real* career. If you prefer privacy, on the other hand, go ahead and play the definitive solitaire package, **Eric's Ultimate Solitaire** (★★★½; $49 list), from Delta Tao Software (800-827-9316 or 408-730-9336).

If the presence of any sort of colorful graphic raises warning flags to your overlords, buy one of the five Infocom Collections, from Activision (800-477-3650 or 310-473-9200). Each volume includes half a dozen or more classic, engrossing text-based adventure games (truly deserving of the term *interactive fiction*). **The Infocom Comedy Collection** (★★★★; $19.95 list) gets my highest recommendation, since it includes both Douglas Adams' Bureaucracy (in which your lone goal is to get your bank to acknowledge a change-of-address card) and Steve Meretzky's classic Planetfall, the merry misadventures of a spacefaring janitor with ambition.

Corporate Essentials

Eventually, you have to face up to the fact that office managers are a superstitious, cowardly lot. Inevitably, they're going to attempt to squeeze some sort of office-ish work out of you. As a man who got fired for the inability to remember the procedure for getting a Coke from the machine across the hall, I'm going to toss **InfoGenie** (★★★½; $79.95 list), from Casady & Greene (800-359-4920 or 408-484-9228), into the Pocket Pak. A simple, fast, and compact free-form data organizer, it's the perfect tool to keep on the desktop for jotting down notes such as how to properly route calls from your boss' spouse, longtime paramour, and fling of the week.

This leaves us with a 40-MB chunk of space on our Pocket Pak cartridge. To fill that space and contribute to your facade of being busy busy busy, add the **Think For Yourself CD-ROM** (★★★; $249 list; education price, $149), from PEMD Education Group (707-894-3688 or pemd@aol.com). It's packed with enormous silos of raw United Nations and U.S. government data on all aspects of life on Spaceship Earth, from demographics to finance to environmental indicators and beyond. Now, the *intended* purpose of this CD-ROM is to present you with the raw data you need in order to reach your own conclusions on the state of the world today, and I applaud this noble goal. For *our* purposes, however, we can copy 40 MB of its data onto our Pocket Pak cartridge to call upon as needed. Scenario: The new *People* magazine has arrived, but the boss insists you actually do the work you're being paid to perform. Solution: Bring that 40-MB pile of data into Excel, tell your spreadsheet program to evaluate each of those data points as a possible solution for Fermat's Theorem, pour yourself an extra-large cup of coffee, and catch up on the comings and goings of Hollywood glitterati. When confronted by management, innocently wave at the screen, which is now presenting an enormous table of numbers and a nearly inert progress indicator. "Damned Mac IIcx," you say ruefully. "If I had a Power Mac on my desk, I'd probably have finished processing the quarterlies an hour ago!"

Andy Ihnatko is a MacUser *columnist, programmer, and freelance writer who hasn't had a real job since 1989.*

The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

RIK: So, Jim, it's your turn to come up with a theme for the column.
JIM: This month, let's have no theme.
RIK: Sort of a *Seinfeld* approach? A column about *nothing?*
JIM: No, a chance to catch up on some tough-to-categorize products.
RIK: OK. That'll give me a chance to rave about **Freddi Fish and the Case of the Missing Kelp Seeds,** from Humongous Entertainment.
JIM: Ah, yes, Disneyesque storytelling done *well* as a game.
RIK: The graphics and interface are great, and the quest for clues is compelling even for parents.
JIM: Another quest game I enjoyed is ◀ **Madeline and the Magnificent Puppet Show,** from Creative Wonders.

RIK: Madeline, the doll-like French schoolgirl character? Get me some insulin!
JIM: I feared cuteness overload too, but the game is appealing in a subdued kind of way: You gather and create the stuff you need in order to put on a puppet show — and learn French or Spanish words as you go.
RIK: I prefer my humor a little more out-there, so I'll put in a plug for Headbone Interactive's **Infinity City** ▼.
JIM: But you were kind of ho-hum about the earlier titles in Headbone's GiggleBone Gang series.

RIK: Headbone's livened things up a bit with a new character and better games that make math and premath — favorite topics of mine — hip and fun.
JIM: My final plug this month is for another low-key product, School Zone's **Alphabet Express.**
RIK: Sounds like another "A is for Apple" yawner.
JIM: It's definitely more *Sesame Street* than MTV, but its supersimple interface is great for prereaders, and its teaching approach combines click-on-the-picture surprises, coloring, and a pleasant game.
RIK: Subtle, understated teaching? Maybe that's this month's theme.
JIM: Or maybe your *Seinfeld* idea was closer. Cue the bass player . . . .

Alphabet Express ★★★★

Ages: 3 – 6.
Price: $39.95 list (CD-ROM).
Well-designed introduction to ABCs and prereading skills is gentle and understated but compelling.
Company: School Zone Interactive, Grand Haven, MI, 800-253-0564 or 616-846-5030; http://www.schoolzone.com/.
Reader Service: Circle #418.

Freddi Fish and the Case of the Missing Kelp Seeds ★★★★

Ages: 3 – 8.
Price: $39.95 estimated street (CD-ROM).
Great graphics mark elaborate game in which you find and trade objects and finish puzzles to solve a mystery.
Company: Humongous Entertainment, Woodinville, WA; 800-499-8386 or 206-486-9258; http://www.humongous.com/.
Reader Service: Circle #419.

Infinity City ★★★★½

Ages: 4 and up.
Price: $29.95 list (CD-ROM).
Clever, activity-filled program teaches math plus premath skills such as counting and pattern recognition.
Company: Headbone Interactive, Seattle, WA; 800-267-4709 or 206-323-0073; http://www.headbone.com/.
Reader Service: Circle #420.

Madeline and the Magnificent Puppet Show ★★★½

Ages: 5 and up.
Price: $39.95 list (CD-ROM).
Winning mix of quest game, creativity tool, and French- and Spanish-vocabulary teacher.
Company: Creative Wonders, Redwood City, CA; 415-482-2300; http://www.ea.com/crwonders.html.
Reader Service: Circle #421.

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-Computer Gaming World

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-Strategy Plus

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-Computer Player

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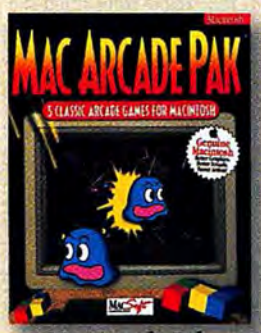

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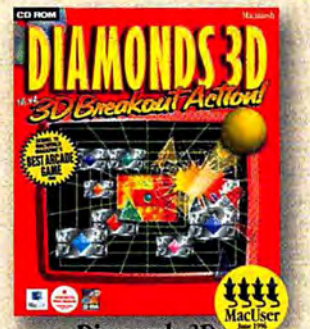

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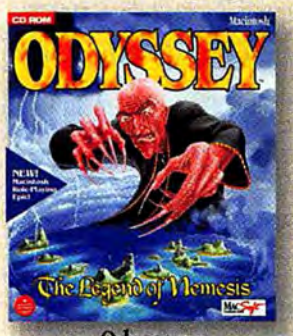

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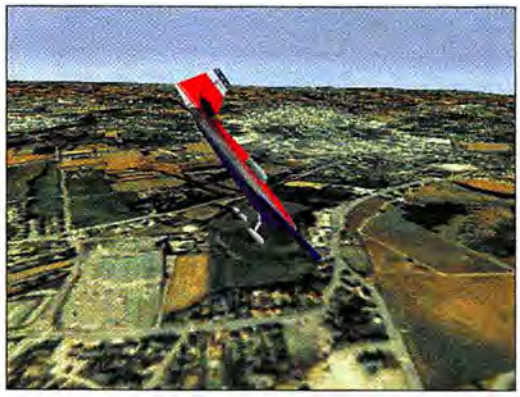
The Game Room

BY BOB LEVITUS AND THE MACUSER EDITORS

GAMES EXCLUSIVE TO THE FASTEST MACS — 68040 and PowerPC machines — are abundant these days. The more power, the better, right? Not necessarily. Although the games we selected this month take advantage of the power today's Macs offer, they leave out some important details that make a game one you simply must have.

Flight Unlimited

You no longer have to settle for the outdated Mac version of Microsoft's Flight Simulator if you like practicing aerobatic maneuvers without having to worry about dodging enemy fire. Flight Unlimited focuses on the joy of flying. But that doesn't mean it's the right game for everyone who likes flying — the controls are too simple for most seasoned pilots, and you should play it only on one of the fastest Macs.



The game starts off gently, with a ground school for learning the basics. A flight instructor leads you through increasingly advanced moves and evaluates your performance. Once you've passed the hoops course by flying through a series of virtual rings in the sky, you're free to take off by yourself in any of four planes or a glider.

Flight Unlimited's planes are easy to fly, if not too easy for those who've played challenging flight sims such as A-10 Attack. You have only a handful of controls — pitch, rudder, and speed. Although the number of controls isn't realistic, the landscapes (enhanced for the Mac OS) and flight physics are. Together they create a spectacular sensation of flying.

As long as you stay busy perfecting your hammerheads, snap rolls, and other aerobatic maneuvers, you may not notice one of the more serious drawbacks of the game — the limited number of landscapes. You cycle through the same pictures over and over as though you're circling a track rather than exploring the countryside. However, one factor that helps make up for the fact that you don't get to cover much ground is the unique ability to see more from the cockpit than in most flight sims. For instance, rather than jumping from view to view (such as from front to left view), you get to scan the scenery as you look in a new direction. You can also choose among several full- and partial-screen cockpits.

It'll take more than appreciation of superior graphics and thrilling aerobatics to enjoy this game. You have to be a member of the exclusive club of owners of PowerPC 604-based machines; otherwise, you'll have to turn off much of the graphic detail and fly at a choppy speed.

Phantasmagoria

It's spooky. It's gory. It's the closest we've seen to an interactive movie on CD-ROM. Unfortunately, Phantasmagoria (shown above) suffers at times from a slow plot, undeveloped characters, and some bad acting.

For most of the movie, the plot is engaging. You play Adrianne, the heroine, who has just moved with her husband into a mansion on a remote island. Your husband is slipping into insanity, and you must combat the evil that inhabits both mansion and husband. What gets in the way of an interesting plot is poorly developed characters, starting with the husband, who remains flat throughout. Even the heroine seems false, because the acting is so bad you'll cringe at times.

The movie does have several nice touches. The background renderings are stunning, although the video is often blurry if you choose full-screen mode. Password protection of the Explicit mode is another clever feature that can put a parent's mind at ease; children can explore without too much gore. There's also a chapter-progress gauge that tells you how far along you are in each chapter (one chapter per CD-ROM; seven discs in all). Best of all is the Hintkeeper, an online guide that gives a gentle nudge whenever you're stuck. The help is easy to access and lets you control the pace of the movie. You'll especially need to turn to it when you reach the last chapter, which is excessively difficult.

Despite our yearnings at times for a movie that was scarier and had better acting and clearer videos, we liked the game enough to play it to the end in less than a week.

Secrets of the Luxor

Secrets of the Luxor is an interactive animated 3-D fantasy game that has the style of Myst. Although the artwork is on a par with Myst's, the game itself falls short. Its puzzles are much harder, and its story line is significantly less cohesive.

As in Myst, you navigate a 3-D-rendered world, in this case an ancient pyramid 300 years in the future. You explore by pointing and clicking, picking up clues and objects as you move about.

What may make this game worthwhile are the stunning graphics created in the same program (Strata Studio) used for Myst. And you can't help but enjoy some of the special features, such as the virtual-reality helmet, which uses Apple's QuickTime VR technology, or the clever use of an instant camera for preserving clues.

The problem with Secrets of the Luxor is it's so challenging you progress too slowly. Numerous hidden doors, mazes, and puzzles halt your progress cold. Without online or printed help, chances are you'll leave all the secrets hidden in the pyramid and turn to some better form of entertainment. (A hint book may be available by now; check with Mojave, the maker of this game.) We recommend Secrets of the Luxor only to those who like games that take weeks or months to complete.

Bob LeVitus is a MacUser *contributing editor and the Mac columnist for the* Houston Chronicle.

GAME POINT

Flight Unlimited is a good flight simulator for those more interested in aerobatic maneuvers than war games, but it lacks realistic aircraft controls. The seven-disc interactive movie Phantasmagoria could give you a good dose of horror if it weren't for bad acting and shallow characters. The exploration game Secrets of the Luxor rivals Myst in beautiful graphics, but it's frustratingly difficult to play.

Flight Unlimited ★★★

Price: $50 (estimated street).
Company: Looking Glass Technologies, Cambridge, MA; 617-441-6333.
Reader Service: Circle #422.

Phantasmagoria ★★★

Price: $55 (estimated street).
Company: Sierra On-Line, Bellevue, WA; 206-649-9800.
Reader Service: Circle #423.

Secrets of the Luxor ★★½

Price: $55 (estimated street).
Company: Mojave, St. George, UT; 800-787-2823 or 801-628-5218.
Reader Service: Circle #424.

The Tip-Off

Flight Unlimited

Press the Tab key to ascend 500 feet or Shift-Tab to descend 500 feet instantly and magically.

After clicking on any plane, hold down Option-M-G when you click on any of the starting options (air, runway, or parking-area starts), for a special treat.

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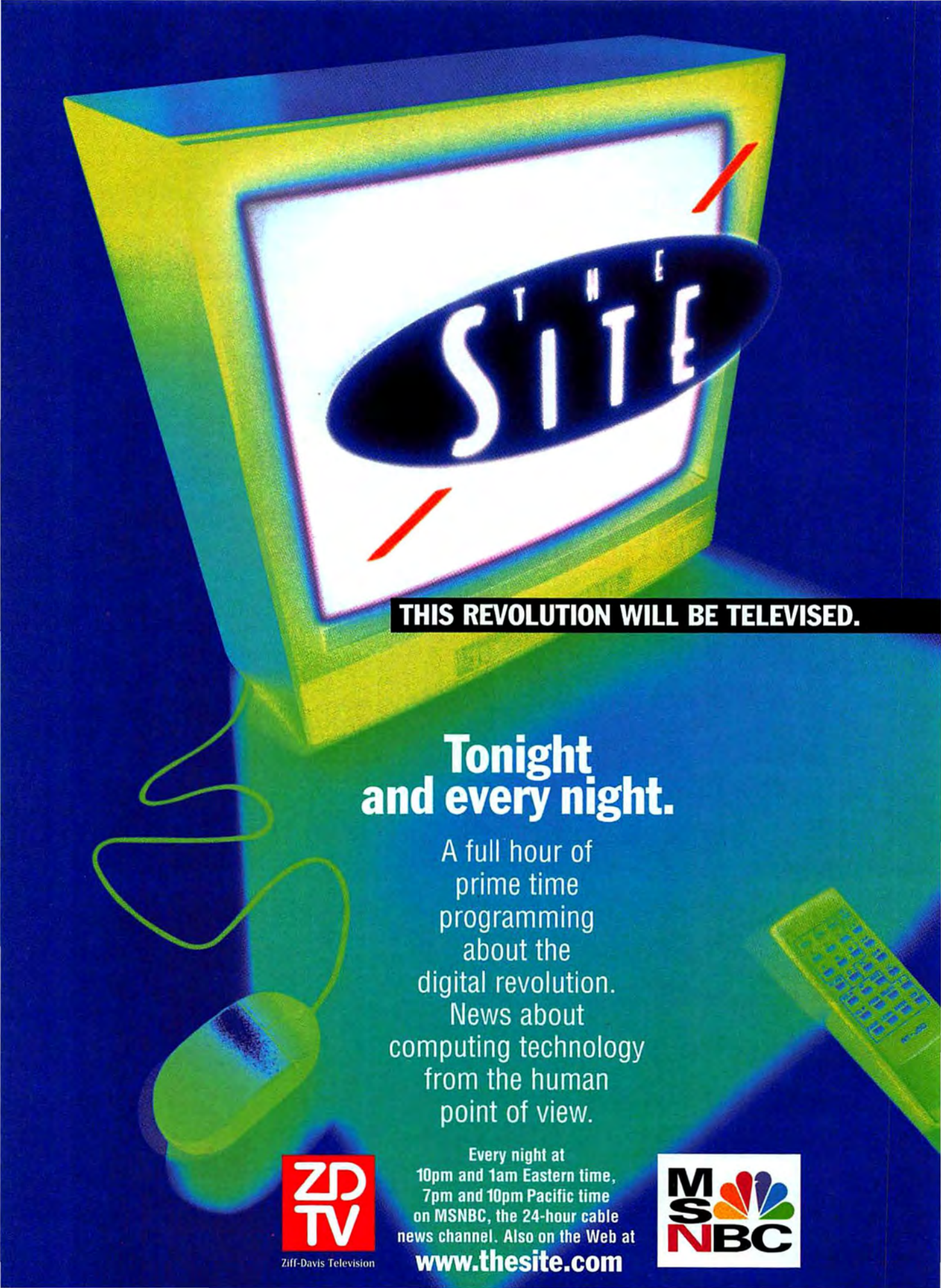
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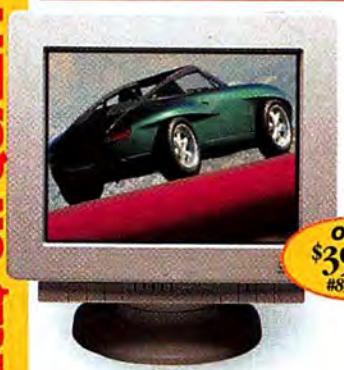

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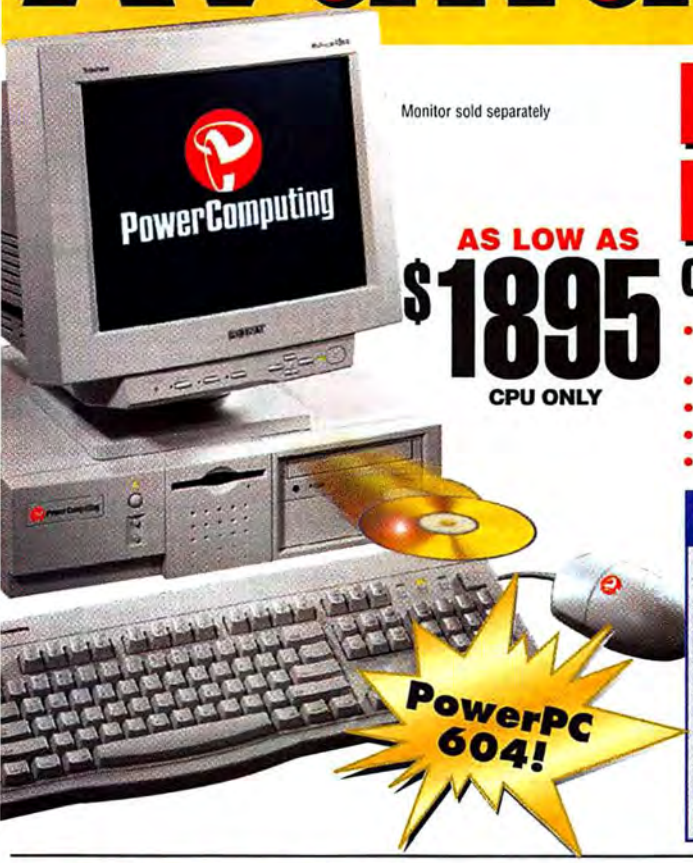

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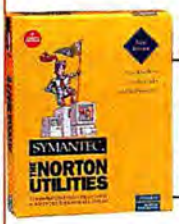

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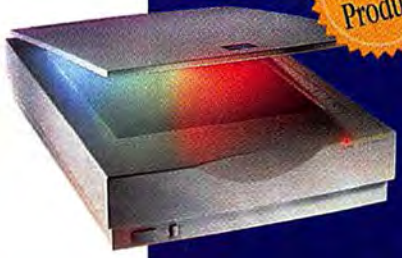

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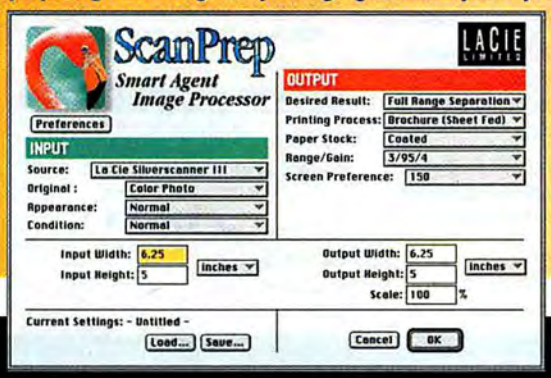

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- Fastest access speed available.
- Transfer rates up to 1200 kb/sec.
- Smooth audio and video playback.

$199 8X CD-Rom

cd-r drives

- Low cost media for backup.
- CD-Rs ship with Gear Multimedia software.
- Create your own CD with fast write capability.

$1299 4X CD Recorder

4X Recorder with Gear MultiMedia	$1299
650 CD-R Disk 74 Minutes 10 Disk Pack	$89

optical drives

- Optical is the new standard in removable reliability.
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- Compact storage convenience.

$599 640MB Optical

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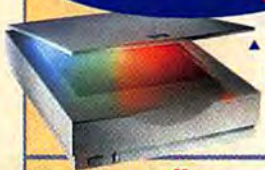
230MB 1 yr. warr.	$399	$389	$399
640MB External 1 yr. warr.			$599
2.6GB External 1 yr. warr.			$1799

silverscanner pro



- 24 bit color, 300 x 600 dpi interpolated to 1200 dpi.

Package 1 $499
Includes: Silverscan, ScanPrep, OmniPage Lite OCR

Package 2 $599
Includes: Photoshop LE Silverscan, ScanPrep, OmniPage Lite OCR

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- The removable media value leader.
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$109 EZ135

SyQuest	
EZ135MB Inc. coupon for 2nd FREE cartridge	$109
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- Includes 3 cartridges!

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8.0GB DAT DDS-2 External	$899
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- Flexible cache buffer automatically adjusts to slower host data transfer rates.

Maximum Storage Capacity
Ideal for network servers and high-end work stations

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30.0GB Quantum DLT External	$2999
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cartridges

	Qty. 1	Qty. 10
Iomega Jaz 1GB	$119 ea.	$99 ea.
Syquest SQ400 44MB	$38 ea.	$37 ea.
Syquest SQ800 88MB	$42 ea.	$41 ea.
Syquest SQ2000 270MB	$62 ea.	$61 ea.
Syquest SQ105 105MB	$53 ea.	$52 ea.
Syquest EZ135 135MB	$18 ea.	$17 ea.
Syquest EZFlyer 230MB	$30 ea.	$29 ea.
Syquest SQ3270 270MB	$48 ea.	$47 ea.
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Optical 230MB	$21 ea.	$20 ea.
Optical 640MB	$49 ea.	$48 ea.
Optical 1.3GB	$59 ea.	$58 ea.
Optical 2.6GB	$85 ea.	$84 ea.
CD-R 74 650MB		$8 ea.
DAT 90m	$9 ea.	$8 ea.
DAT 120m	$25 ea.	$24 ea.
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PowerPort Platinum PRO PC Card	519

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SUPRA SONIC 33.6 v.34 w/voice	275
SUPRA 33.6 PB FAX Modem	149
SUPRA EXPRESS 28.8	149

US Robotics

28.8 Sportster V.34 Internet Bundle	$175
Sportster14,400 Mac & Fax	72
28.8 V.Everything Sportster	389

TDK

28.8 V.34 PCMCIA PB190/5300	$259

Motorola

Modemsurfer 28.8 V.34	$169
Power 28.8 V.34	270
ISDN Bitsurfer Pro	369

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FWB

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iomega

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Jaz 1.0GB Drive	499

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8MB 70NS	179	16MB 70/60NS	133/137	**PB 190 Series**	
16MB 70NS	295	32MB 60NS	249	4MB/8MB 70NS	$95/149
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1MB 70NS	$30	4MB 70NS/EDO	$69/75	32MB70NS	385
4MB 70NS	65	8MB 70NS/EDO	189/75	**PB500 Series**	
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4MB 70NS	$99	32MB 70NS/EDO	292	16MB/32MB RAM	194/360
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4MB 70NS	59	16MB 60NS	132	PB DUO-20/32MB	279/385
8MB 70NS	99	32MB 60NS	273	**PB2300 Series**	
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				PB2300-36/48MB	389/559

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Standard 72-Pin Simms:
Quadra 605/630, 610, 650, 700, 800/840AV, LCIII, LC475, LC630, Performa 450-560, 575 and 6115CD, PowerMac 6100, 7100, 8100, WS 80, WS60, WS 95, WS 6150 and WS 8150, 9150.

168 Pin Dimms:
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Centris FPU 25MHz	$189	256K 80NS Video RAM	$17	1MB VRAM PM72/75/8500	$55
FPU 33MHZ DUO/P600	52	512K Video RAM	22	2MB VRAM PM 9500	186
FPU Color Classic 16MHZ	44	256K/512K Cache Card	72/282	256K Cache Dimm	87
LC575 33MHZ Math CoProc.	240	1MB Cache Card	792	512K Cache Dimm	150
				1MB Cache Dimm	269

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DAYSTAR

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Turbo 040i 33MHZ w/cache no FPU	609
PowerPro 601 100MHZ w/cache	1240
Turbo 601 100 MHZ w/adapter	1175
PowerCard 601 100MHZ	959

SONNET

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Quad Doubler 40MHZ w/FPU Centris 610	345
Quad Doubler 50MHZ w/FPU Quadra 610	390
Quad Doubler 50MHZ w/FPU Centris 650	390
Quad Doubler 50 MHZ Centris 660AV/7/900	390

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APPLE

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Laserwriter 4/600	895
Personal Laserwriter 320	809

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HP 5MP	1045
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HP DeskWriter 680C	319

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Super CoolScan	1999
AGFA StudioScan IISI	795
ARCUS II	1941
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UMAX

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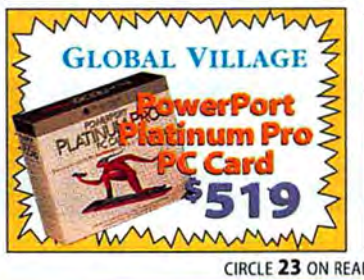
POWERLOOK II - Full Photoshop	1744
VISTA S-12 - Full Photoshop	898
VISTA S-6 E - Photoshop LE	534



MEDIA

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5.25" MO 1.3GB 1024k b/s / 1.2GB 512k b/s	$59
5.25" MO 650MB 1024k b/s / 594MB 512k b/s	52
3.5" MO 230MB 3-pack/Mac Formatted	55/60
3.5" MO 128MB 3-pack/Mac Formatted	44/50
SONY CD-Recordable	
74 Min 4x 650MB-10 Pack	$73
74 Min 4x 650MB	8

Verbatim

Verbatim Syquest 44MB Cartridge - Mac	$38
Verbatim Syquest 88MB Cartridge - Mac	$44
5.25" MO 2.6GB 1024k b/s / 2.3GB 512k b/s	$79/79
5.25" MO 640MB1024k b/s / 540mb 512k b/s	$42/42

iomega

Iomega ZIP Cartridge 100MB	$19
- 3pack	49.50
- 10 Pack	139
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- 5 pack	479
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- 5 pack	294

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SINGLE	$19.50
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1.0 GB	DT-1080FB	Quantum	11ms	3 yrs	$269	$344
1.05 GB	DT-51080	Seagate NEW PRODUCT!	10 ms	3 yrs	$269	$344
1.05 GB	DT-31230	Seagate NEW LOW PRICE!	9.0 ms	5 yrs	$355	$430
2.0 GB	DT-4421	Micropolis NEW LOW PRICE!	10.0 ms	5 yrs	$459	$545
2.0 GB	DT-4221	Micropolis NEW LOW PRICE!	8.0 ms	5 yrs	$595	$670
2.1 GB	DT-32550	Seagate Barracuda IILP	8.0 ms	5 yrs	$705	$780
4.3 GB	DT-3243	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$899	$999
4.3 GB	DT-15150	Seagate Barracuda NEW LOW PRICE!	8.0 ms	5 yrs	$1,050	$1,125
4.3 GB	DT-15230	Seagate Hawk 4 NEW PRODUCT!	9.0 ms	5 yrs	$899	$975
9.0 GB	DT-1991	Micropolis NEW LOW PRICE!	12 ms	5 yrs	$1,899	$1,999
9.0 GB	DT-410800	Seagate Elite 9 NEW LOW PRICE!	11 ms	5 yrs	$1950	$2,050

AUDIO/VIDEO TUNED DRIVES

Capacity	Model No.	Mechanism	Seek	Warr.	Internal	External
1.05 GB	DT-51080AV	Seagate	9 ms	3 yrs	$269	$330
2.0 GB	DT-4221AV	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$650	$725
2.1 GB	DT-32550AV	Seagate Barracuda	8.0 ms	5 yrs	$705	$780
4.3 GB	DT-3243AV	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$950	$1025
4.3 GB	DT-15150AV	Seagate Barracuda	8.0 ms	5 yrs	$1,050	$1,125
9.0 GB	DT-1991AV	Micropolis NEW LOW PRICE!	12 ms	5 yrs	$1975	$2,075
9.0 GB	DT-410800AV	Seagate Elite 9 NEW LOW PRICE!	11 ms	5 yrs	$1950	$2,050

FAST/WIDE SCSI DRIVES

Capacity	Model No.	Mechanism	Warr.	Internal	External
2.1 GB	DT-32550W	Seagate Barracuda 2LP Wide	5 yrs	$799	$899
2.1 GB	DT-4221W	Micropolis 4221Wide	5 yrs	$650	$750
4.3 GB	DT-15150W	Seagate Barracuda 4 Wide	5 yrs	$1,125	$1,225
4.3 GB	DT-3243W	Micropolis 3243Wide	5 yrs	$999	$1,099
9.0 GB	DT-1991W	Micropolis 1991Wide	5 yrs	$2,000	$2,125
9.0 GB	DT-1991AVW	Micropolis 1991AVWide	5 yrs	$2,075	$2,200
9.0 GB	DT-410800W	Seagate Elite 9 Wide	5 yrs	$2000	$2,125

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8.0 GB	DT-15150W-2	Seagate - Fast/Wide Barracuda 4 (2)	4.0 ms	5 yrs	$3099
18.0 GB	DT-1991WAV	Micropolis - Fast/Wide 1991AV (2)	4.5 ms	5 yrs	$5199

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Capacity	Model No.	Internal	PHASER-I
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200 MB	SQ5200	$410	$460
270 MB	SQ3270	$410	$460

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Capacity	Model No.	Format	PHASER-I
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4-8 GB	HP-1533A	DDS-2	$1,299
5-10 GB	Exabyte-8505	8mm	$2,150
15-30 GB	DLT-2000XT	DLT	$3,295
20-40 GB	DLT-4000	DLT	$4,725

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1.3 GB	HP-C1716	23 ms	$1,999
2.6 GB	Maxoptix	18 ms	$1,999

MEDIA

Type	Price
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Syquest 88	$46
Syquest 105	$54
Syquest 200	$76
Syquest 270	$60
Optical 128 MB	$22
Optical 230 MB	$30
Optical 1.0 GB	$100
Optical 1.3 GB	$90

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- ATI XClaim 4MB PCI Video Card
- Agfa Studio Scan IIsi/w Trans
- Sony 8GB DAT tape drive
- SyQuest 200 Drive/w 2 cartridges
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- Radius ThunderColor 1600 PCI Video Card
- Yamaha 4x/2x CDR with Toast & Director
- SyQuest 200 Drive with 2 carts
- Microtek ScanMaker III with Transparency
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- TrueVision Targa 1000 PCI Digital Card
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- FWB Jackhammer SCSI-3 controller
- Sony 8GB DAT tape drive

LOW Price

Systems Starting at $1729

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Per Month $399

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- Internal CD ROM
- 80MB RAM
- 2GB hard drive
- Extended keyboard
- Sony 20SF II Monitor
- ATI XClaim 4MB PCI Video Card
- TrueVision Targa 1000 PCI Digital Card
- 8GB SCSI-3 Fast&Wide disk array
- FWB Jackhammer SCSI-3 controller
- Sony 8GB DAT tape drive

Systems Starting at $2499

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Per Month $579

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- Internal CD ROM
- 144MB RAM
- 4GB internal hard drive
- Radius PrecisionView 21 Monitor
- ATI XClaim 4MB PCI Video Card
- TrueVision Targa 2000 PCI Digital Card
- 8GB SCSI-3 Fast&Wide disk array
- Yamaha 4x/2x CDR with Toast & Director
- FWB Jackhammer SCSI-3 controller
- Exabyte 8505 16GB DAT tape drive

Systems Starting at $3299

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- Sony 20SFII Trinitron monitor
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- Kodak DC40 digital camera
- SyQuest 200 Drive/w 2 cartridges

Systems Starting at $2499

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Per Month $359

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- Internal CD ROM
- 144MB RAM
- 4GB hard drive
- Extended keyboard
- ATI XClaim 4MB PCI Video Card
- Sony 20SFII Monitor
- Yamaha 4x/2x CDR w/toast & director
- Kodak DC50 digital camera
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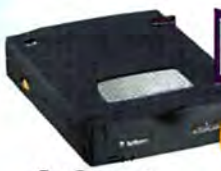

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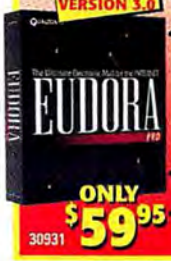

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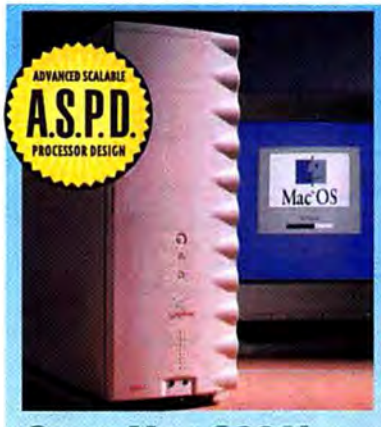

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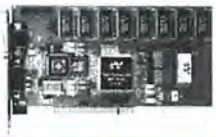

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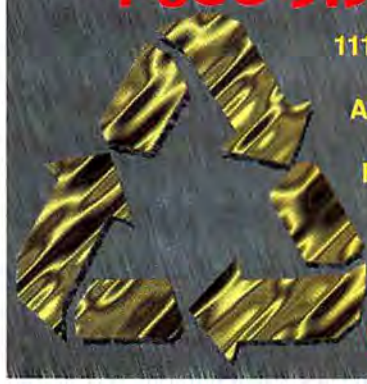

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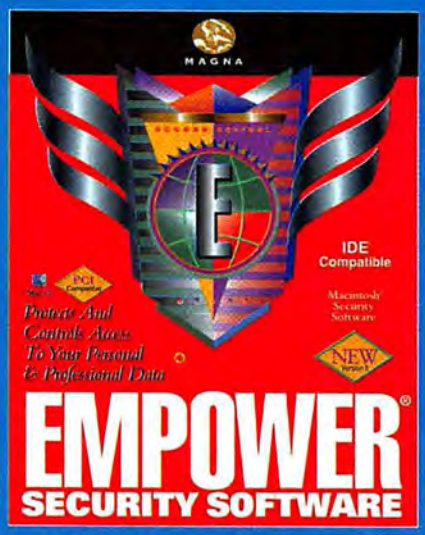

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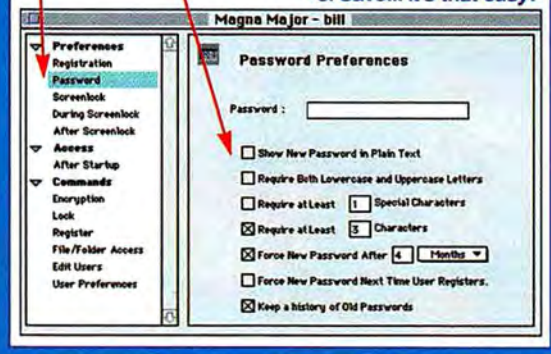

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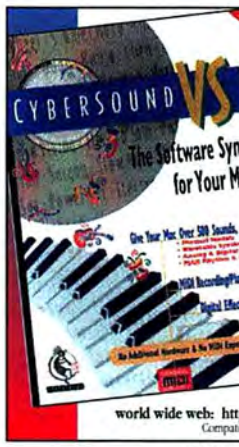

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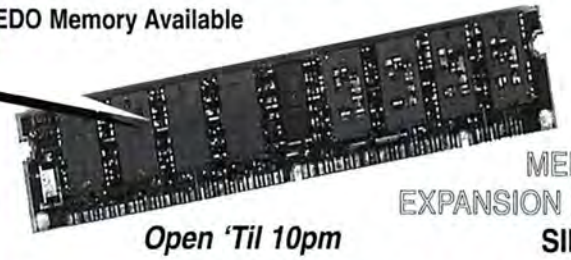

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Umax	VistaS12	720
Umax	VistaS12 Deluxe	829
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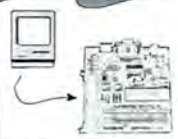

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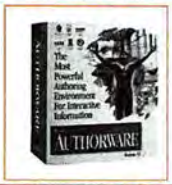

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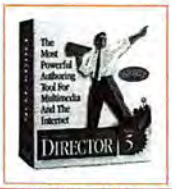

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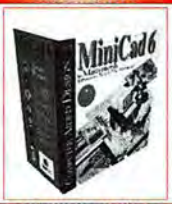

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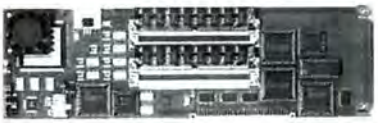

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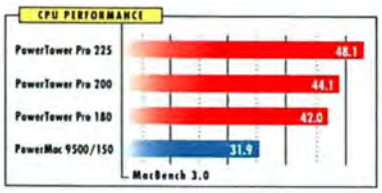

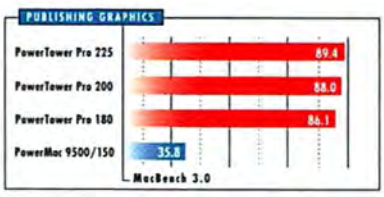

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